The Bulletin *of the* University *of* Minnesota

General Information for the Year 1920-1921

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The *Bulletin* of the University of Minnesota is issued as often as twice a month during the University year.

The *Bulletin* comprises—

The *Reports* of the President and of the Board of Regents, the *Register*, the *Bulletin of General Information*, the annual announcements of the individual colleges of the University, announcements of special courses of instruction, and reports of University officers.

These bulletins will be sent gratuitously to all persons who apply for them. The applicant should state specifically which bulletin or what information is desired. Address

The REGISTRAR,
The University of Minnesota,
Minneapolis, Minnesota.

Research Publications. Containing results of research work. Papers are published as separate monographs numbered in several series.

Current Problems Series. Containing papers of general interest in various lines of work.

School of Mines Experiment Station Bulletin. Containing results of investigations conducted by the station.

These publications are sent free to libraries and to other institutions publishing similar material. To individuals, a small charge is made. For lists and prices, address

The LIBRARIAN,
The University of Minnesota,
Minneapolis, Minnesota.

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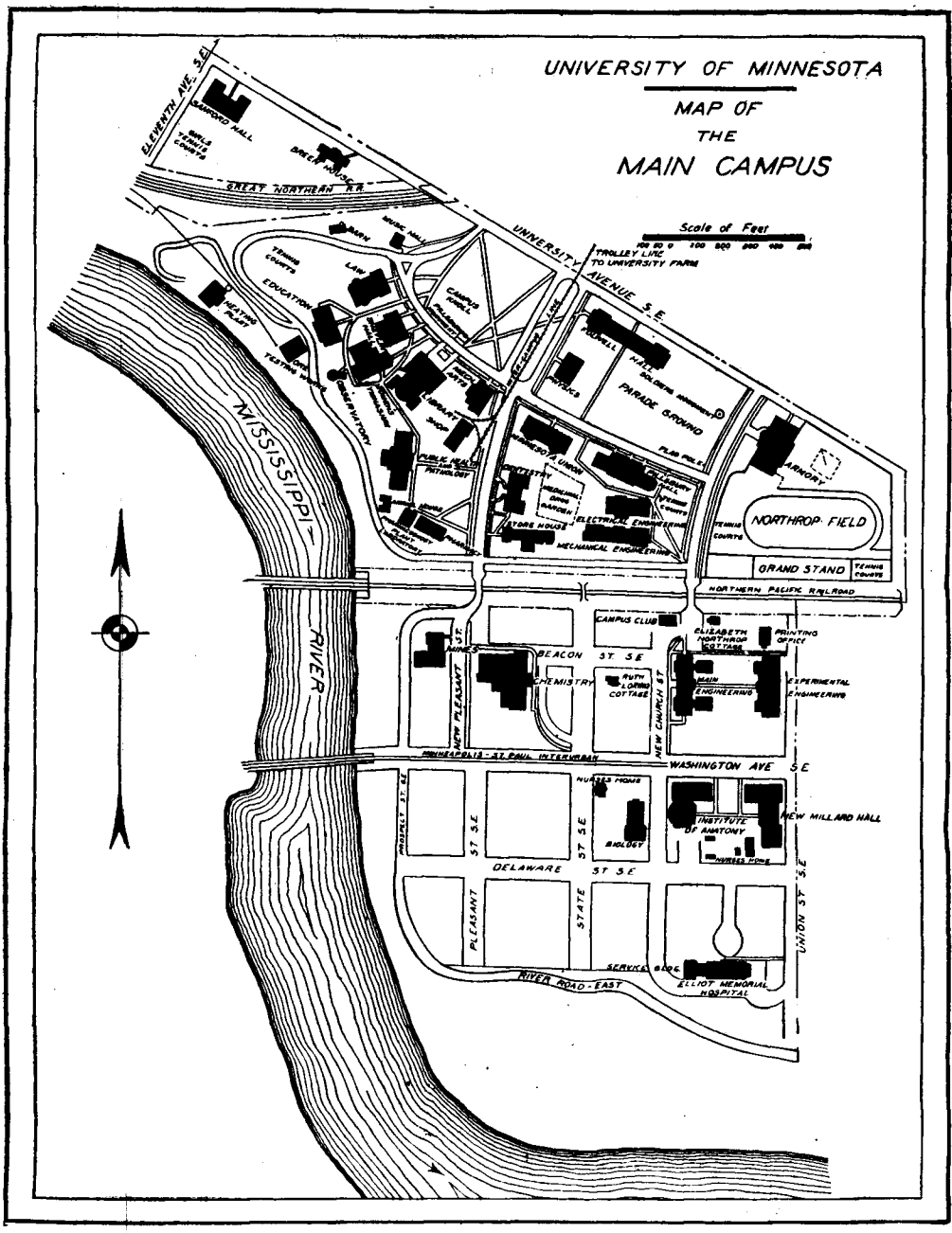
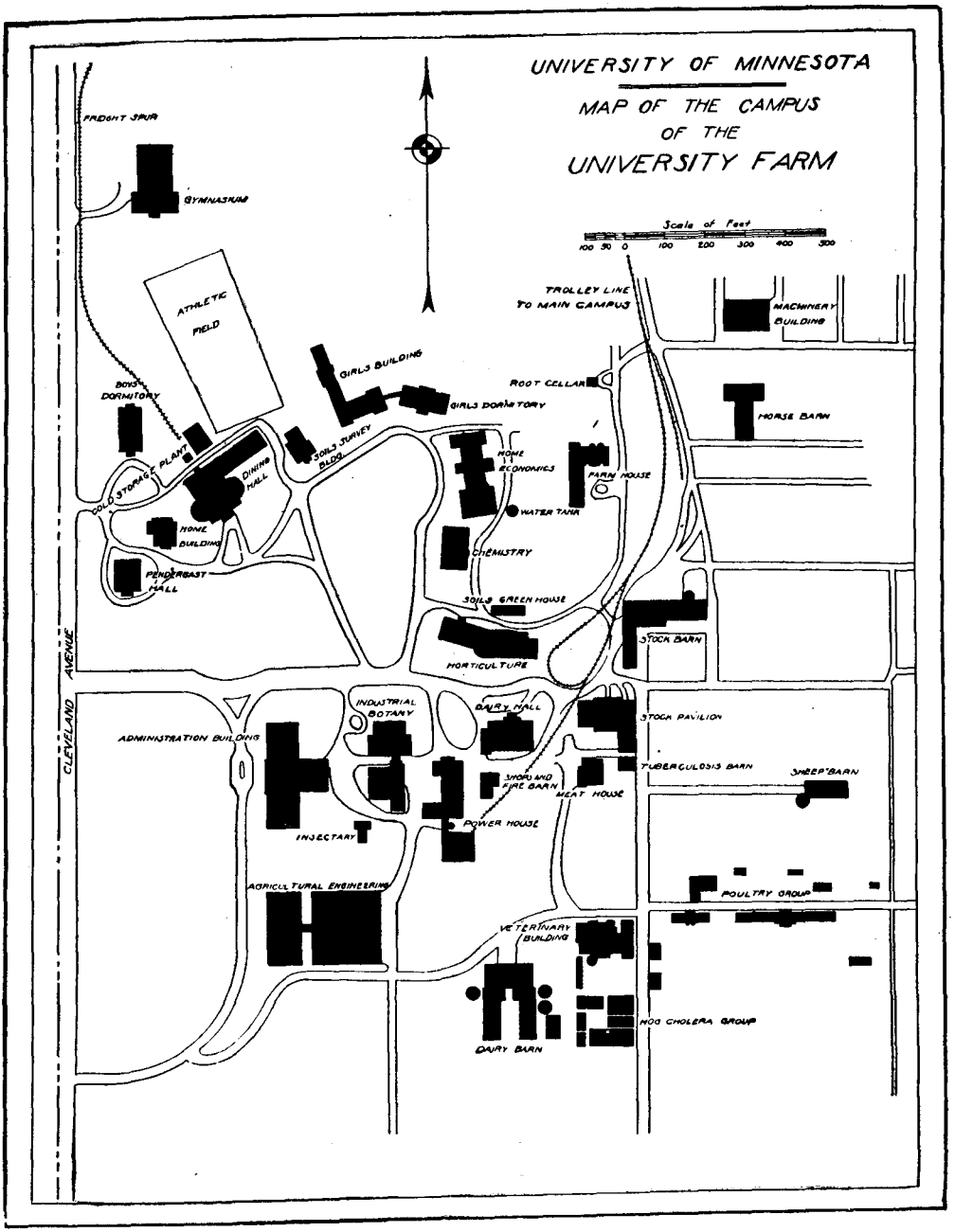


Area of Main Campus, 108.5 acres



Area of University Farm, 422.56 acres

1920

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UNIVERSITY CALENDAR

1920-1921

1920			
September	18	Saturday	Payment of fees closes, except for new students
September	21	Tuesday	Juniors and seniors, School of Mines, report for completion of field work
September	21-28	Week	Examinations for removal of conditions, and entrance examinations
			Registration period, College of Agriculture, Forestry, and Home Economics
September	20-25		Registration period, College of Science, Literature, and the Arts
September	27	Monday	First semester evening extension classes begin
September	27-28		Registration days for all colleges not indicated above
September	28	Tuesday	Payment of fees for new students closes
September	29	Wednesday	Fall quarter begins, 8:30 a.m.
October	4	Monday	School of Agriculture, first term begins
October	21	Thursday	Senate meeting, 4:30 p.m.
November	2	Tuesday	Election Day; a holiday
November	25	Thursday	Thanksgiving Day; a holiday
December	16	Thursday	Senate meeting, 4:30 p.m.
December	22	Wednesday	School of Agriculture, first term closes
December	22	Wednesday	Fall quarter ends, 5:20 p.m.
December	22	Wednesday	Christmas vacation begins, 5:20 p.m.
1921			
January	4	Tuesday	Christmas vacation ends, 8:30 a.m.
January	4	Tuesday	Winter quarter begins, 8:30 a.m.
January	10	Monday	School of Agriculture, second term begins
January	21	Friday	First semester evening extension classes close
January	31	Monday	Second semester evening extension classes begin
February	12	Saturday	Lincoln's Birthday; a holiday
February	17	Thursday	Senate meeting, 4:30 p.m.
February	22	Tuesday	Washington's Birthday; a holiday
March	24	Thursday	Winter quarter ends, 5:20 p.m.
March	24	Thursday	Spring vacation begins, 5:20 p.m.
March	30	Wednesday	Spring vacation ends, 8:30 a.m.

March	30	Wednesday	Spring quarter begins, 8:30 a.m.
March	30	Wednesday	School of Agriculture, second term closes
April	30	Saturday	Field work for sophomores and juniors, School of Mines, begins
May	19	Thursday	Senate meeting, 4:30 p.m.
May	20	Friday	Second semester evening extension classes close
May	30	Monday	Memorial Day; a holiday
June	12	Sunday	Baccalaureate service
June	14	Tuesday	Spring quarter closes, 5:20 p.m.
June	15	Wednesday	Forty-ninth annual commencement
June	17-18		Registration days for summer session
June	20	Monday	Summer session begins
July	30	Saturday	Summer session closes
September	28	Wednesday	Fall quarter, 1921-22, begins

Program of Entrance Examinations 1920-21

Entrance examinations for admission to the various colleges of the University will be conducted according to the following schedule, in Room 112, Library Building, unless otherwise specified.

Any student finding a conflict in his program should report to the registrar for adjustment.

Tuesday,	Sept. 21	9 a.m.	Business Subjects, Elementary Algebra, Plane Geometry
		2 p.m.	Manual Subjects, Domestic Art and Science, Agriculture, Higher Algebra, Solid Geometry
Wednesday,	Sept. 22	9 a.m.	Astronomy, Botany, Geology, Chemistry, Physiography, Zoology, Physics, Physiology
		2 p.m.	American Government, History, Economics, Commercial Geography, History of Commerce, Economic History of England, Economic History of the United States
Thursday,	Sept. 23	9 a.m.	English
		2 p.m.	German, Greek, French, Latin, Scandinavian, Spanish

A representative of each department will be at the office of the head of the department each forenoon of entrance examination week from 9:00 to 12:00 to give information and advice.

Schedule of Condition Examinations, 1920-21

Examinations for the removal of conditions of the fall, winter, or spring quarters in the Colleges of Science, Literature, and the Arts, Education, Engineering and Architecture, Mines, Chemistry, Business, and Agriculture, Forestry, and Home Economics, will be given according to the following schedule.

Friday,	Sept. 24	9 a.m.	Animal Biology, Botany, Physics, Agronomy and Farm Management, Animal Husbandry, Entomology and Economic Zoology
		2 p.m.	Astronomy, Chemistry, Agricultural Biochemistry, Bee Culture, Experimental Engineering
Saturday,	Sept. 25	9 a.m.	Economics, Mathematics and Mechanics, History, Education, Agricultural Education, Dairy Husbandry, Farm Engineering, Drainage
		2 p.m.	French, Spanish, Italian, German, Greek, Latin, Scandinavian, Forestry, Home Economics, Drawing and Descriptive Geometry
Monday,	Sept. 27	9 a.m.	Comparative Philology, Rhetoric, English, Horticulture, Plant Pathology, Poultry Husbandry, Rural and Agricultural Journalism, Metallurgical subjects
		2 p.m.	Political Science, Music, Philosophy, Psychology, Sociology and Anthropology, Social and Civic Work, Soils, Veterinary Medicine, Civil, Electrical, Mechanical Engineering, and Architectural subjects
Tuesday,	Sept. 28	9 a.m.	Geology and Mineralogy
		2 p.m.	Mining subjects

In case of conflict, special arrangements must be made with the instructor.

Schedules for the remaining schools and colleges will be announced in the fall, and may be secured at the offices of the respective deans.

Similar examinations will also be given not earlier than the seventh week or later than two weeks preceding the final examination periods of the winter and spring quarters.

No student may take more than one examination to remove a condition.

ORGANIZATION OF THE UNIVERSITY

The University is organized in schools, colleges, and divisions as follows:

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

THE COLLEGE OF ENGINEERING AND ARCHITECTURE

THE DEPARTMENT OF AGRICULTURE, comprising—

- THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS
- THE SCHOOLS OF AGRICULTURE, comprising—
  - THE CENTRAL SCHOOL, UNIVERSITY FARM
  - THE NORTHWEST SCHOOL, CROOKSTON
  - THE WEST CENTRAL SCHOOL, MORRIS
- THE AGRICULTURAL EXPERIMENT STATIONS, comprising—
  - THE STATE EXPERIMENT STATION, UNIVERSITY FARM
  - THE NORTHWEST EXPERIMENT STATION, CROOKSTON
  - THE NORTH CENTRAL EXPERIMENT STATION, GRAND RAPIDS
  - THE WEST CENTRAL EXPERIMENT STATION, MORRIS
  - THE NORTHEAST DEMONSTRATION FARM AND EXPERIMENT STATION, DULUTH
  - THE SOUTHEAST DEMONSTRATION FARM AND EXPERIMENT STATION, WASECA
  - THE FRUIT BREEDING FARM, ZUMBRA HEIGHTS
  - THE STATE TREE STATION, OWATONNA
  - THE FOREST EXPERIMENT STATIONS, ITASCA AND CLOQUET
- THE AGRICULTURAL EXTENSION DIVISION
- THE SHORT COURSES IN AGRICULTURE

THE LAW SCHOOL

THE MEDICAL SCHOOL, including—

- THE SCHOOL OF NURSING

THE COLLEGE OF DENTISTRY

THE SCHOOL OF MINES, including—

- MINNESOTA SCHOOL OF MINES EXPERIMENT STATION

THE COLLEGE OF PHARMACY

THE SCHOOL OF CHEMISTRY

THE COLLEGE OF EDUCATION, including—

- THE UNIVERSITY HIGH SCHOOL

THE GRADUATE SCHOOL

THE SCHOOL OF BUSINESS

THE UNVERSITY EXTENSION SERVICE, comprising—

- GENERAL EXTENSION DIVISION
- AGRICULTURAL EXTENSION DIVISION

THE BOARD OF REGENTS

The Hon. FRED B. SNYDER, Minneapolis, President of the Board - 1922
*MARION LEROY BURTON, Minneapolis - - - - - - *Ex officio*
The President of the University
The Hon. J. A. A. BURNQUIST, St. Paul - - - - - *Ex officio*
The Governor of the State
The Hon. J. M. MCCONNELL, St. Paul - - - - - - *Ex officio*
Commissioner of Education
The Hon. JOHN G. WILLIAMS, Duluth - - - - - - - 1921
The Hon. A. E. RICE, Willmar - - - - - - - - 1921
The Hon. CHARLES L. SOMMERS, St. Paul - - - - - - 1921
The Hon. PIERCE BUTLER, St. Paul - - - - - - - 1922
The Hon. C. W. GLOTFELTER, Waterville - - - - - - 1922
The Hon. W. J. MAYO, Rochester - - - - - - - - 1925
The Hon. MILTON M. WILLIAMS, Little Falls - - - - - 1925
The Hon. GEORGE H. PARTRIDGE, Minneapolis - - - - - 1926

EXECUTIVE OFFICERS

*MARION LEROY BURTON, Ph.D., D.D. LL.D., President
LOTUS D. COFFMAN, Ph.D., President-elect
ERNEST B. PIERCE, B.A., Registrar
GEORGE H. HAYES, University Comptroller
JAMES T. GEROULD, B.A., Librarian
JOHN SUNDWALL, Ph.D., M.D., Director of the University Health Service
*OSCAR L. BUHR, Executive Secretary and Secretary of the Board of Regents
JOHN B. JOHNSTON, Ph.D., Dean of the College of Science, Literature, and the Arts
JOSEPH M. THOMAS, Ph.D., Assistant Dean of the Senior College, College of Science, Literature, and the Arts
WILLIAM H. BUSSEY, Ph.D., Assistant Dean of the Junior College, College of Science, Literature, and the Arts
ROYAL R. SHUMWAY, B.A., Assistant Dean of Students' Work, College of Science, Literature, and the Arts
*LAUDER W. JONES, Ph.D., Dean of the College of Engineering and Architecture
ROSCOE W. THATCHER, M.A., Dean and Director of the Department of Agriculture
EDWARD M. FREEMAN, Ph.D., Dean of the College of Agriculture, Forestry, and Home Economics
*WILLIAM R. VANCE, Ph.D., LL.D., Dean of the Law School
ELIAS POTTER LYON, Ph.D., M.D., Dean of the Medical School
ALFRED OWRE, B.A., M.D., C.M., D.M.D., Dean of the College of Dentistry
WILLIAM R. APPLEBY, M.A., Dean of the School of Mines
FREDERICK J. WULLING, Phm.D., LL.M., Dean of the College of Pharmacy

* Resigned July 1, 1920.

*Lauder W. Jones, Ph.D., Dean of the School of Chemistry
*Lotus D. Coffman, Ph.D., Dean of the College of Education
Guy Stanton Ford, Ph.D., Dean of the Graduate School
George W. Dowrie, Ph.D., Dean of the School of Business
Richard R. Price, M.A., Director of University Extension
Jessie S. Ladd, Dean of Women
Edward E. Nicholson, M.A., Dean of Student Affairs

* Resigned July 1, 1920.

THE UNIVERSITY OF MINNESOTA

DESCRIPTION OF DEPARTMENTS

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS offers a four-year course of study leading to the degree of Bachelor of Arts. The work is elective under certain limitations intended to secure a proper balance between breadth of foundation and liberal culture on the one hand and specialized training on the other.

Course in Training for State and Federal Administration.—A four-year course leading to the degree of Bachelor of Arts. Students whose programs satisfy the requirements of the Graduate School may receive the degree of Master of Arts at the end of the fifth year.

Course in Training for Municipal Administration and Engineering.—A four-year course leading to the degree of Bachelor of Science. Students whose programs satisfy the requirements of the Graduate School may receive the degree of Master of Arts at the end of the fifth year.

Course in Training for Diplomatic and Consular Service.—A four-year course leading to the degree of Bachelor of Science. At the end of the fifth year students whose programs satisfy the requirements of the Graduate School may receive the degree of Master of Arts.

Course in Training for Social and Civic Work.—A five-year course, during the first four years of which the student secures a broad education with special attention to history, economics, political science, and sociology; the fifth year is devoted to technical subjects with professional training in social work. The degree of Bachelor of Science is given at the end of four years, and either a special certificate or the degree of Master of Arts upon the completion of the fifth year.

Course in Military Science and Tactics.—The instruction offered in the Reserve Officers' Training Corps is open to students of this college.

Course in Arts and Music.—A four-year course leading to the degree of Bachelor of Music, in which the theoretical and practical work in music is combined with the study of acoustics, psychology, modern languages, English literature, and history. The object is to provide a well-rounded cultural course for those who are preparing for professional work in music.

Combined courses in Arts and Medicine.—A seven-year course leading to the degrees of Bachelor of Science and Doctor of Medicine, and an eight-year course leading to the degrees of Bachelor of Arts and Doctor of Medicine.

Combined course in Arts and Law.—A six-year course leading to the degrees of Bachelor of Arts and Bachelor of Laws.

Combined course in Arts and Dentistry.—A six-year course leading to the degrees of Bachelor of Arts and Doctor of Dental Surgery.

Combined course in Arts and Chemistry.—A five-year course leading to the degrees of Bachelor of Arts and Bachelor of Science in Chemistry.

Americanization Training Course.—A four-year course, with graduate studies possible, consisting largely of technical courses and field work. The course is a practical application of anthropological knowledge of modern and advanced peoples, and deals with adult immigrants more than with any other people in America. Fundamental courses in economics, history, language, political science, and sociology form an important part of the course of study. The course leads to the degree of Bachelor of Science at graduation, and to the degree of Master of Arts or to a special certificate on the completion of a fifth year.

Combined course in Arts and Nursing.—A five-year course leading to the degree of Bachelor of Science and a Certificate in Nursing. The first two years and a summer quarter are spent in the College of Science, Literature, and the Arts. The third and fourth years are spent in hospital work, and the fifth year in both hospital and class work.

Combined courses in Arts and Architecture.—A four-year course in architecture and decoration leading to the degree of Bachelor of Science. A six-year course in Arts and Architecture leading to the degree of Bachelor of Science at the end of four years and to an advanced degree at the end of six years.

Pre-professional training.—In this college are given also the academic work required for admission to the Medical School, the Law School, the College of Dentistry, the School of Business, and the College of Education, and various non-professional subjects required in other schools and colleges of the University.

Journalism.—Courses in journalism, including reporting, copy reading, and editorial writing and administration, are offered at present. It is expected that additional courses will be added as students are prepared for the advanced work.

THE COLLEGE OF ENGINEERING AND ARCHITECTURE offers courses of study of five years each in Civil, Mechanical, and Electrical Engineering, and Architecture, leading to the degrees of Civil, Mechanical, and Electrical Engineer, and Architect. The degrees of Bachelor of Science in Engineering and Bachelor of Science in Architecture are conferred at the end of the fourth year. This college also offers work in the Graduate School leading to the degree of Master of Science.

For students who entered in the fall of 1919 and those who may enter hereafter, the college offers a four-year course of study in Civil, Mechanical, and Electrical Engineering, and in Architecture. These courses lead to the degree of Bachelor of Science in Civil, Mechanical, or Electrical Engineering, or Architecture.

A fifth or post-senior year has been arranged in each of the departments of the college to afford students an opportunity for continuing their work either as students in the College of Engineering and Architecture or in the Graduate School. A large part of the work planned for the post-senior year will be elective and will include opportunity for investigative work in specialized fields of engineering. The work offered in the Graduate School leads to the degree of Master of Science in Engineering.

The degree of Civil, Mechanical, or Electrical Engineer will be conferred upon those who have received the degree of Bachelor of Science in Civil, Mechanical, or Electrical Engineering after four years of engineering experience in positions of responsibility, and who complete the equivalent of one year's work in college either in residence or in absentia, and present a satisfactory thesis.

The candidate for the engineer's degree who holds a master's degree in engineering must have had three years of engineering experience in positions of responsibility and must also present a satisfactory thesis.

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS offers four-year courses in Agriculture, Forestry, and Home Economics leading to the degree of Bachelor of Science. The course in Agriculture comprises general courses in agricultural education, manual training, agronomy and farm management, dairy husbandry, animal husbandry, and horticulture, and special courses in such agricultural sciences as agricultural biochemistry, agricultural economics, entomology, plant pathology, and soils.

The course in Forestry includes courses in technical forestry, commercial lumbering, and wood pulp and distillation products. In addition to the instructional work carried on at University Farm, three quarters are given at Itasca State Park, where a well-equipped demonstration forest is available as a laboratory.

The courses in Home Economics include a general course, a teachers' course in the general field of home economics, special teachers' courses in textiles and clothing, foods and home mangement, and related arts, a course for dietitians, and one for institutional managers.

Graduate work is offered in all special lines of agriculture. The special problems are for the most part correlated with the investigational work of the Experiment Station.

The Schools of Agriculture offer three-year courses of study, giving special training in farm life and home economics, and adapted especially to the needs and opportunities of farm boys and girls. The Central School is located at St. Anthony Park; the Northwest School, at Crookston; and the West Central School, at Morris.

The Dairy Short Courses.—These include a two-week course for experienced butter-makers, a three-week course for cheese-makers, and a one-week course for ice-cream makers during November and December; and during January and February a six-week elementary course in creamery work designed for those who have had but a limited practical experience. These courses offer to young men an opportunity to become more thoroly trained in the science and art of making the largest quantity of butter and cheese of the best possible grade, and teach the fundamentals of ice-cream making and milk-plant management.

The Farmers' and Home-Makers' Week is held early in January. Instruction in agriculture and home economics is offered in regular classes, and important conferences are held, many agricultural organizations of the state holding their sessions at this time.

The Short Course for Traction Engineers and Threshermen will be given some time during the winter months. This course, which includes both lecture and laboratory work, deals especially with the care, operation, and adjustment of the separator, and is planned to meet the needs of both experienced threshermen and beginners. Some attention is also given to the operation of both steam and gas engines.

The Editors' Short Course, held in May, is devoted to instruction in the conduct of the affairs of the rural newspaper and consideration of the problems of the rural press.

The Boys' and Girls' Week Short Course, held early in April, gives instruction in the care and management of farm animals, in the growing of field and garden crops, and in cooking, sewing, garment-making, and canning, with special reference to boys' and girls' club work.

The Experiment Station conducts investigations in the various lines of agriculture with a view to solving problems of interest and importance to the farmers of Minnesota. Secondarily, its work being closely correlated with that of the College of Agriculture, Forestry, and Home Economics, it offers educational and research advantages to undergraduate and graduate students of this college. The main station is located at St. Anthony Park; there are substations at Crookston, Morris, and Grand Rapids; demonstration farms at Waseca and Duluth; and forest experiment stations at Cloquet and Itasca.

The Extension Division of the Department of Agriculture aims to bring to the farmers of the state information leading to the improvement of the farm and the home through the agency of institutes, lectures, demonstrations, and demonstration farms, industrial and agricultural contests, a press bureau, and by correspondence and personal visits.

THE LAW SCHOOL offers a three-year course, leading to the degree of Bachelor of Laws. The so-called "case system" method of teaching law, approved by the leading law schools of the country, is employed. The school unites with the College of Science, Literature, and the Arts in offering a combined six-year course in Arts and Law, leading to the degrees of Bachelor of Arts and Bachelor of Laws, in which the first-year work in law is counted as the equivalent of a year's work toward the academic degree.

THE MEDICAL SCHOOL offers a five-year course, leading to the degree of Doctor of Medicine, comprising two years in the scientific departments of the school, two years in its practical or clinical departments, and one year in a hospital internship or in advanced laboratory study or research. All students are required to secure the degree of Bachelor of Science or of Bachelor of Arts before receiving the degree of Doctor of Medicine. To this end the College of Science, Literature, and the Arts and the Medical School unite in offering the following courses of study:

1. A combined course, leading to the degrees of Bachelor of Science and Doctor of Medicine, consisting of (a) two years of work in the College of Science, Literature, and the Arts, including certain required subjects (see page 29), and (b) five years in the Medical School.

2. A combined course, leading to the degrees of Bachelor of Arts and Doctor of Medicine, consisting of (a) three years of properly selected work in the College of Science, Literature, and the Arts, including the required subjects noted, and (b) five years in the Medical School.

The bachelor's degree in Arts or Science from other recognized universities or colleges will be accepted toward the degree of Doctor of Medicine.

Graduate and research work is offered to qualified students. (See page 19.)

The School of Nursing is conducted in connection with the Medical School and the University Hospital service. It offers a three-year course, the first six months occupied in preliminary study, the remaining two and one-half years in residence and in hospital and out-patient training, leading to the degree of Graduate in Nursing. A combined five-year course in Arts and Nursing is offered by the College of Science, Literature, and the Arts and the School of Nursing, leading to the degrees of Bachelor of Arts and Graduate in Nursing. The first two years and a summer quarter are spent in the Arts College; the third and fourth years in hospital work, and the fifth year in both hospital and class work.

A Course in Public Health Nursing, covering a period of four months, preliminary to a more extended course of one year to which it contributes, is conducted by the School of Nursing with the assistance of the departments of Education, Sociology, and Psychology, and of a number of social service organizations which provide ample opportunities for field work.

The Short Course in Embalming, offered by the General Extension Division with the coöperation of the Medical School, the School of Chemistry, and the State Board of Health, is a three-month course of study, given annually. On the successful completion of the work a certificate is granted which is accepted by the State Board of Health in lieu of examination for an embalmer's license.

THE COLLEGE OF DENTISTRY offers a four-year course of study leading to the degree of Doctor of Dental Surgery. It unites with the College of Science, Literature, and the Arts in offering a six-year course leading to the degree of Bachelor of Science, conferred at the completion of two years of academic work and the first two years of dental work, and the degree of Doctor of Dental Surgery, conferred at the end of the fourth year in dentistry.

The School for Dental Hygienists.—This course consists of two years' work in the University Hospitals and the College of Dentistry, leading to the degree of Graduate Dental Hygienist.

Graduate work is open in certain fields of dentistry to students having a baccalaureate or dental degree from this or any other approved college or university. Such students will pursue courses of study in accordance with the regulations of the Graduate School. (See page 19.)

Extension courses.—The following series of courses will be conducted by the General Extension Division in 1920-21 for the benefit of dental practitioners:

1. Prosthesis.—(a) A series of studies comprising lectures and laboratory and clinical work, covering impression-taking, model-making, mounting of casts on articulators, the selection and arrangement of teeth, and flasking, vulcanizing, and finishing plates; (b) an advanced course open only to those who have completed course a, dealing more intricately with the detail of technique and enlarging upon the artistic features which enter into prosthesis.

2. Oral Surgery.—A course consisting of lectures, clinics, and practice, comprising local anaesthesia, exodontia, and minor oral surgery.

3. Crown and Bridge Work.—A course of lectures, demonstrations, and practice, covering the technique in the preparation of vital teeth for bridge abutments, and the various steps incident to the construction of bridges.

4. Porcelain Jacket Crowns.—A course of instruction comprising lectures, technique, and clinics. The entire field incident to a complete working knowledge of porcelain will be covered.

5. Orthodontia.—This course will consist of two sessions of two weeks each, and chronologically separated from each other by approximately five months.

6. A course in Dental Mechanics extending over a period of one college year. A certificate is awarded upon the satisfactory completion of the work.

THE SCHOOL OF MINES offers three regular four-year courses, namely, Mining Engineering, Mining Engineering (specializing in Geology), and Metallurgy, leading to the degrees of Engineer of Mines, Engineer of Mines (in Geology), and Metallurgical Engineer, respectively. They are designed to prepare men to enter their profession with a thoro grounding in mathematics, in the sciences, and in the fundamental principles of mining engineering and metallurgy. A system of apprenticeship during summer vacations is a regular part of the curriculum and is required of all students who are candidates for degrees.

THE COLLEGE OF PHARMACY offers the following courses: A regular three-year course, leading to the degree of Pharmaceutical Chemist; a four-year course, leading to the degree of Bachelor of Science in Pharmacy, which includes in addition to the regular three-year course the equivalent of one year in the College of Science, Literature, and the Arts; and two graduate courses, leading respectively to the degrees of Master of Science in Pharmacy and Doctor of Science in Pharmacy, which are open to those who have the bachelor's degree in Pharmacy, and who have shown exceptional scholarship and ability.

THE SCHOOL OF CHEMISTRY offers three courses. Two of these, the four-year course in Chemistry, leading to the degree of Bachelor of Science in Chemistry, and the five-year course in Arts and Chemistry, leading to the degree of Bachelor of Arts after four years and of Bachelor of Science in Chemistry at the end of the fifth year, are designed for those who wish to become teachers of chemistry, to take positions as assistants in research, or to hold positions in chemical industries not requiring special engineering training. The third, a course in Chemical Engineering, extends over five years. It leads to the degree of Bachelor of Science at the end of four years and of Chemical Engineer at the end of the fifth year, and it aims to give the student a broad foundation in chemistry and some of the allied sciences.

THE COLLEGE OF EDUCATION offers a two-year course, beginning with the junior year, which furnishes a practical and a theoretical training for prospective high-school teachers and principals, for principals of elementary schools, for supervisors of special studies, and for superintendents of school systems. It also offers four-year courses in Art Education and Physical Education for Women, beginning with the freshman year. All these courses lead to the degree of Bachelor of Science in Education. A year of graduate work, including advanced studies in education and philosophy, and in one or more of the subjects of the secondary curriculum, at the option of the candidate, leads to the degree of Master of Arts.

THE GRADUATE SCHOOL gathers into a single organization and unites for the purpose of administration all the activities of the University in all its schools and colleges in so far as they relate to advanced instruction offered for the second or higher degrees, namely, Master of Arts, Master of Science, and Doctor of Philosophy. The privileges of this school are in general open to all who have received bachelors' degrees from reputable colleges and universities, based on courses substantially equivalent to those at this University.

Graduate work in medicine is maintained jointly by the Medical School and the Mayo Foundation for Medical Education and Research (see special bulletin). The degree of Bachelor of Science (or equivalent) and Doctor of Medicine and one year of intern service in an acceptable hospital are prerequisites for admission to the clinical departments. Properly qualified students may be admitted to the medical laboratory departments (Anatomy, Physiology, Bacteriology, and Pathology) without the medical degree and internship. A number of fellowships and scholarships are provided for selected students undertaking graduate courses in chosen specialties in medicine (see page 56). These courses cover a period of three years and lead to the degree of Master of Science or of Doctor of Philosophy in the various fields.

Graduate work in certain problems related to dentistry is offered to qualified students in the fundamental or laboratory departments mentioned above. Clinical material and opportunities to supplement this research is available from the Dental Clinic, the Medical Dispensary, and the University Hospitals.

THE SCHOOL OF BUSINESS aims to give thoro and adequate training to prospective business executives, and to prepare students to analyze business data accurately and to make practical application of the principles involved. The school offers two full years of study, beginning with the junior year, leading to the degree of Bachelor of Science in Business. The course is one of intensive study and specialization in particular branches of business, adapting the student's curriculum to his future plans. The fields include a general course in business, and courses in accounting, agricultural business, banking, merchandising, foreign trade, employment management, commercial organization, and secretaryship and secretarial work.

THE UNIVERSITY SUMMER SESSION is organized for six weeks in June and July under the authority of the Board of Regents as a regular part of the University. Courses carrying university credit, including all the subjects of the state professional certificate, are offered for college students, experienced teachers, and others who desire the opportunity for advanced study. Students may secure not more than nine quarter credits at one six weeks' session, except by special permission.

On the main campus, courses are offered in the Colleges of Science, Literature, and the Arts, Education, Engineering, and Dentistry, and in the Law, Business, and Graduate Schools. The Medical School offers regular courses in the clinical branches.

On the University Farm campus, the College of Agriculture, Forestry, and Home Economics offers courses in Agriculture and Home Economics adapted to the needs of teachers and others not in attendance during the regular college session, and also to regular students. The Library Training School is held at the same time and place under the direction of the commissioner of education. For a special circular of summer work, inquire at the registrar's office.

SPECIAL COURSES.—In practically all of the colleges, students of mature age and adequate preparation are permitted to pursue, under the direction of the faculty, one or two distinct lines of study.

UNIVERSITY EXTENSION.—All extension work of the University of Minnesota has been established as an organic unit of the University under the title of Extension Service. The Extension Service is organized in two divisions, each under its own director, the General Extension Division and the Agricultural Extension Division.

The work of the Agricultural Extension Division is indicated on page 16. The General Extension Division conducts evening classes and correspondence courses; provides communities with faculty lectures and lyceum courses of popular lectures, concerts, and entertainments; maintains a municipal reference bureau and a bureau of visual instruction; holds annual short courses in merchandising, dentistry, embalming, banking, citizenship, and social service; offers guidance for the development of community organizations; and gives advice to schools and to other organizations on the selection and production of plays. Bulletins of evening classes and of correspondence and lecture courses may be had upon request. Address the General Extension Division.

THE UNIVERSITY LIBRARY

The University Library comprises all the collections of books belonging to the institution and contains about 280,000 volumes.

A large part of the library is housed in the Library Building on the main campus. Branch libraries are maintained in connection with each of the colleges, and there are, in addition, small departmental collections attached to several departments.

A catalog of the entire collection is maintained in the General Library, and there are, as well, special catalogs of the libraries of the Colleges of Agriculture, Engineering, Law, Medicine, and Mines.

The purpose of the University Library is twofold: to supply the books and references used in connection with the courses of instruction and for outside cultural reading; and to teach students to use them with a minimum of time and effort and with the maximum of profit.

The *Library Handbook,* copies of which may be had gratis upon application at the library, contains a large amount of information essential to the proper use of the library, and it should be read carefully by every student.

Registration automatically entitles students to the privileges of the library.

The reference librarian and all the assistants are at all times ready to aid students in familiarizing themselves with the library and in directing them in the use of the various catalogs and indexes.

THE STUDENT HEALTH SERVICE

A health fee of two dollars a quarter is paid by each student of the University for the maintenance of the Student Health Service. This entitles the student to physical examination, and medical service and care when needed.

The offices of the Health Service, and the Students' Hospital and Dispensary are located in Pillsbury Hall, first floor. The services of the hospital and dispensary are available at all hours of the day and night. Physicians of the Health Service are in attendance daily. The telephone call is University of Minnesota (Dinsmore 2760), Station 168.

The facilities of the dispensary are such that one hundred students a day can be given attention. The normal capacity of the hospital is twenty-five beds. In emergencies, the capacity can be increased. Ample provisions are made for the isolation of communicable diseases.

The Health Service has been established for the purpose of safeguarding the health of students. Its aims are (1) to help each student entering the University of Minnesota to possess a healthy, vigorous, active, and harmoniously developed body, thereby contributing much to his success while in college and in later life; (2) to reduce to the very minimum that prodigious academic and economic loss due to indisposition and illness of students. Positive health is its goal.

There are three main lines to the activities of the University Health Service: (1) personal attention, (2) sanitation, and (3) education.

1. The personal division is concerned with the physical examinations of students. Complete physical records of all students are kept. From each record can be determined, in a large measure, what procedure is essential to keep the student in the best physical condition during his academic life. The following are some of the phases of the work in the personal division:

(a) Provisions for maintaining the health of normal, physically sound students; coöperation with the Department of Physical Education regarding physical exercise; education along lines of right living; guarding environment.

(b) Protection of the physically sound student from communicable diseases that are continually creeping into the University; early detection and isolation of all cases of communicable diseases—tuberculosis, diphtheria, scarlet fever, measles, typhoid fever, smallpox, mumps, etc.

(c) Provisions for the care and treatment of such cases of communicable diseases; isolation hospital.

(d) Treatment and care of all students who are ill or in need of medical advice or treatment.

(e) Reconstruction and reclamation; corrections of defects, advice and treatment of all subnormals.

2. Division of sanitation.—The student's environment should be made as hygienic as possible. Hence this division concerns itself with the sanitary conditions both on and off the campus. Rooming and boarding houses are both inspected and regulated.

3. Education.—Every student in the University is made familiar with the fundamentals of both personal and public hygiene. Through courses in this subject, daily bulletins, exhibits, public lectures, etc., education in hygiene and right living is conducted.

MILITARY SCIENCE AND TACTICS

REQUIRED WORK

All physically fit male students are required to take instruction in military science for three hours each week during the first two undergraduate years of their course. Previous instruction in this subject at other institutions under an officer of the regular army detailed as professor of military science and tactics exempts the student from so much of this work as the length of his prior training justifies in each case. All students taking this course are given the instruction prescribed for the Basic Course, Senior Division, Reserve Officers' Training Corps. No credits are allowed for this work.

ELECTIVE WORK

Any student legally eligible for enrollment who has completed the Basic Course, Senior Division, R.O.T.C., or other military work announced as equivalent thereto, may register for and be enrolled in the Advanced Course, Senior Division, R.O.T.C., provided the professor of military science and tactics and the president of the University, respectively, recommend and approve such enrollment in each case.

Students enrolled in the Advanced Course receive from the government a fixed sum a day as commutation of rations while pursuing this course; they are required to sign an agreement to continue in the course during their time at the University (not to exceed two years), and to attend such summer training camps as are prescribed by the secretary of war, all expense incident to training-camp attendance being borne by the government.

Students who pass successfully the Advanced Course are, upon the recommendation of the president of the University, eligible for appointment as reserve officers of the army, and are also eligible for appointment for a period of six months as temporary lieutenants of the army, with pay at the rate of one hundred dollars a month while serving.

The Advanced Course embraces three departments: infantry, coast (heavy) artillery, and signal corps, in any one of which the student may be enrolled.

Credits for the Advanced Course, R.O.T.C., will be announced.

ADMISSION

GENERAL REQUIREMENTS

Admission to the colleges or schools of the University which accept students directly from the high school is either by examination or certificate. The candidate must offer fifteen units of high-school work so chosen as to include those subjects required by the college or school which he desires to enter. No candidate will be admitted with less than fifteen units. In case the candidate did not have an opportunity to take all the required subjects, the registrar may, however, authorize substitutions in the list of required subjects to the extent of one unit, unless otherwise stated in the requirements of the individual college or school.

Candidates who do not hold a diploma from an approved preparatory school must enter by examination in all the fifteen units required, regardless of the fact that some of these may have been completed in such a school.

All colleges will admit freshman students at the opening of the fall quarter. In addition, freshman students will be admitted at the opening of the winter and spring quarters in the Colleges of Science, Literature, and the Arts; Agriculture, Forestry, and Home Economics; and Engineering and Architecture; in the School of Nursing they will be admitted at the opening of the spring quarter. All other students admitted at this time must present credentials of advanced standing from other colleges showing their qualification to continue the work of the winter or spring quarter.

Under List of Entrance Subjects (page 25) is shown the minimum and maximum number of units of any one subject that will be accepted by the various colleges of the University. For a statement of the specific units required in any subject or group, see Requirements of Individual Colleges, page 27-33.

ADMISSION BY EXAMINATION

Entrance examinations are offered at the University during the opening week, September 21 to 28. Candidates entering by this method must pass examinations in fifteen units so chosen as to satisfy the specific requirements of the college to which entrance is desired. (See Requirements of the Individual Colleges, pages 27-33.) Certificates from the College Entrance Examination Board, from the Minnesota State High School Board, or from the New York Regents' Examinations are accepted in lieu of examinations in the subjects they represent. Those desiring to take examinations should notify the registrar in writing not later than September 1. See schedule of examinations, page 8.

ADMISSION BY CERTIFICATE

Only *graduates* of *approved* schools are admitted by certificate.

Graduates of the following schools, provided their preparation satisfies the specific requirements of the college they desire to enter, may be admitted to the freshman class upon presentation of credentials in proper form. (See Registration below.)

1. Minnesota state high schools or other accredited schools in the state.

2. Schools in any other state accredited by the state university of that state.

3. Minnesota state normal schools and normal schools of other states having similar courses.

The student who does not hold a diploma from an approved school may gain admission by examination as indicated on page 24.

For a list of accredited schools in Minnesota, see pages 35-37.

REGISTRATION

The applicant for admission should request the principal or superintendent to forward to the registrar of the University a complete transcript of his high-school or preparatory-school record showing the number of weeks and hours a week spent upon each study, with the grades entered as *passed, passed with credit,* or *passed with honor.* Credential blanks prepared by the University must be used. These blanks may be secured upon application at the registrar's office. Upon receipt of the credentials at the University the registrar will notify the applicant with regard to his admission, and will send directions for registration.

Students who were in attendance the preceding year are required to pay fees ten days before classes begin. Bills of fees are mailed from the registrar's office in ample time. Those not receiving the material by September 1 should notify the registrar at once. See calendar, page 7, and penalty fees, page 46.

LIST OF ENTRANCE SUBJECTS

The term *unit* means not less than five recitations of forty minutes each week for a school year of at least thirty-six weeks. In manual subjects and kindred courses, it means the equivalent of ten recitation periods a week for thirty-six weeks.

Group A: English

English, four units.

(a) Principles of rhetoric

(b) Practice in written expression in each of the years of the course, on an average of not less than one hour a week

(c) Classics

GROUP B: LANGUAGES

Latin—
- Grammar, one unit
- Caesar, four books, one unit
- Cicero, six orations, one unit
- Virgil, six books, one unit

Greek—
- Grammar, one unit
- *Anabasis,* four books, one unit

Spanish—
- Grammar, one unit
- Literature, one, two, or three units

German—
- Grammar, one unit
- Literature, one, two, or three units

French—
- Grammar, one unit
- Literature, one, two, or three units

Scandinavian Languages—
- Grammar, one unit
- Literature, one, two, or three units

GROUP C: HISTORY AND SOCIAL SCIENCES

History—
- Ancient, to Charlemagne, one unit
- Modern, from Charlemagne, one unit
- English, one-half or one unit
- Senior American, one-half unit

Social Sciences—
- American government, one-half or one unit
- Elementary economics, one-half unit
- Commercial geography, one-half or one unit
- History of commerce, one-half or one unit
- Economic history of England, one-half unit
- Economic history of the United States, one-half unit

GROUP D: MATHEMATICS

- Elementary algebra, one unit
- Plane geometry, one unit
- Higher algebra, one-half unit
- Solid geometry, one-half unit
- Trigonometry, one-half unit

GROUP E: NATURAL SCIENCES

- Physics, one unit
- Chemistry, one unit
- Botany, one-half or one unit
- Zoology, one-half or one unit
- Physiology, one-half unit
- Astronomy, one-half unit
- Geology, one-half unit
- Physiography, one-half unit
- General Science, one unit

GROUP F: VOCATIONAL AND MISCELLANEOUS SUBJECTS

Not more than four units in studies of this group may be counted towards admission. The subjects are no longer designated by the University. The applicant is free to present in this division such studies as are not listed in Groups A, B, C, D, and E, but which are certified by the superintendent or principal as being of acceptable nature and counted towards graduation.

REQUIREMENTS OF THE INDIVIDUAL COLLEGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. *Regular Bachelor of Arts Course**

(1) English, four units; or three units of English accompanied by four units of one foreign language, or two units in each of two foreign languages.

(2) Mathematics: elementary algebra, one unit; plane geometry, one unit.

(3) Enough additional work to make in all fifteen units, of which not more than four may be in Group F.

2. *Graduates of Minnesota State Normal Schools*

Graduates of the Advanced Graduate Course of a Minnesota state normal school are admitted with advanced standing equivalent to one year's credit, and receive the degree of Bachelor of Arts upon completing in this college 135 credits provided they comply with the usual requirements for graduation. Such students will not be permitted to elect the following courses for credit: Education 1, or Psychology 1-2-3.

Individual graduates of the Advanced Latin Course (five years) or of the Advanced English Course (five years) of a Minnesota state normal school, who, on the basis of maturity and ability, present from the president of the normal school certificates of special fitness, will be admitted with advanced standing under the same regulations and proviso.

3. *Unclassed Students*

Unclassed students are (1) persons of mature years engaged in teaching or other occupation, but registered in this college without having satisfied the entrance requirements in full: (2) all others who have been permitted to register for less than eleven hours of work. Only by permission of the Administrative Board and upon the presentation of satisfactory reasons for not taking the regular course will an applicant be admitted as an unclassed student. Unless he takes the same examinations or presents the same credentials as are required of those who enter the freshman class he can be admitted only upon vote of the faculty. A new application must be made each quarter.

COLLEGE OF ENGINEERING AND ARCHITECTURE

Including Courses in Civil, Electrical, and Mechanical Engineering, and Architecture

1. English, four units; or English, three units, and foreign language, two units.

2. Mathematics: elementary algebra, one unit; plane geometry, one unit.

3. Enough additional work to make in all fifteen units, of which not more than four may be in Group F.

High-school students desiring to enter this college are urged to take advanced algebra and solid geometry in high school. Students entering

* Also all courses described on pages 13 and 14.

with deficiencies in these subjects will be required to take courses covering these deficiencies in the University before they can proceed with other work which depends upon these subjects.

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Students entering this college should submit their credentials to the enrollment committee, University Farm, St. Paul.

1. English, four units; or three units accompanied by four units of one foreign language, or two units in each of two foreign languages.

2. Mathematics: elementary algebra, one unit; plane geometry, one unit.

3. Enough additional work to make in all fifteen units, of which not more than four may be in Group F.

Prospective students are urged to elect chemistry and physics as a part of their high-school course.

Every prospective student in Agriculture is also urged to obtain at least six months' practical experience on a farm before entering college. Those whose farm experience credentials are not satisfactory will be examined as to their familiarity with farm practices, and farm experience will be required during the college course in accordance with the results of these examinations.

Schools of Agriculture

The schools are not of collegiate grade. For further information, see special bulletins.

LAW SCHOOL

Regular Students

Students desiring to enter the Law School must first complete two full years (not less than eighty-seven quarter (fifty-eight semester) credits) of collegiate work in science, literature, and the arts at this or some other university or college of equal rank. (See admission to the College of Science, Literature, and the Arts, page 27.) Such candidates may be admitted upon presenting their credentials to the registrar.

A special pre-legal course is offered by the College of Science, Literature, and the Arts covering those subjects which are particularly desirable as preliminary to the study of law.

The faculty of the Law School recommends that prospective law students devote the major part of their time while in high school to the study of the following subjects: English, Latin, history, mathematics, French or German, and science.

Special Students

Applicants who are twenty-one years of age and have preliminary education sufficient at least to entitle them to admission to the College of Science, Literature, and the Arts, may, upon furnishing satisfactory evidence of their ability to pursue the law course with profit to themselves

and without hindrance to the regular students, in the discretion of the faculty, be admitted to the Law School as special students. Such special students are not candidates for a degree.

Special students entering with seventy-eight quarter (fifty-two semester) credits of academic work may become regular students by complying with the requirements for admission before the beginning of their second year in the Law School.

MEDICAL SCHOOL

On account of the limited capacity of the school, not more than ninety freshmen will be accepted. Applicants will be selected on the basis of scholarship, character, and general fitness. About sixty will be chosen early in July; the remainder about August 15. All applications must be accompanied by a ten-dollar preliminary fee, which will be credited toward the first quarter's tuition, or returned if the applicant is not accepted. Other qualifications being equal, residents of Minnesota will be given preference when the selection of candidates is made.

Applicants for admission must present two years of academic collegiate work, which are defined as including not less than ninety quarter (sixty semester) credits carrying not less than ninety quarter (sixty semester) honor points. In explanation of this requirement it may be noted that on the basis of A, B, C, and D as passing grades, A gives three honor points for each credit; B, two points; C, one point; and D, no point. It is impossible, therefore, for applicants with grades of only C and D to secure admission. Those having a high ratio of honor points to total credits will be given preference.

The premedical academic credits must include the following:

1. Rhetoric, nine quarter (six semester) credits. At Minnesota this requirement is met by English 4-5-6.

2. Chemistry, eighteen quarter (twelve semester) credits, including general chemistry, qualitative and quantitative analysis,* and organic chemistry with laboratory work. At Minnesota, Chemistry 4-5 (or 1-2-3), 11, 20, and 31-32 are necessary. Students are advised also to take chemistry in high school.

3. Physics, twelve quarter (eight semester) credits, including proper laboratory work. At Minnesota, Physics 21 and 22, and any two of the following combinations, Physics 41 and 42, 51 and 52, and 61 and 62, meet the requirement. Students are advised to complete them all.

4. Zoology, twelve quarter (eight semester) credits, including proper laboratory work. At Minnesota, Animal Biology 5-6-7 meets this requirement.

5. Foreign Language. Sufficient high school or college training to insure a reading knowledge of French or German medical literature. For French this requirement is fulfilled (a) by passing any two of Courses 21, 22, 23 (Scientific French) at Minnesota or by presenting acceptable credits covering similar work done elsewhere; (b) by passing an

* Quantitative analysis required in 1922-23; advised for 1920-21 and 1921-22.

examination; the minimum preparation demanded for admission to this examination is fifteen credits of French. For German the language requirement is fulfilled (a) by passing Courses 31-32 (Medical German) at Minnesota or by presenting acceptable credits covering similar work done elsewhere; (b) by passing an examination in Scientific German; the minimum preparation for admission to this examination is two years of German.

6. Premedical students are advised to secure preparation in some or all of the following subjects: Latin (high school or college), higher mathematics, psychology, sociology, drawing, and comparative anatomy.

Applicants whose premedical academic work has been taken elsewhere than at the University of Minnesota must present to the registrar certified credentials of both preparatory and college work, showing subjects, credits, and grades.

The degree of Doctor of Medicine is conferred only upon those who have received the degree of Bachelor of Arts or Bachelor of Science from this or some other recognized university or college. Combined courses offered by the College of Science, Literature, and the Arts and the Medical School lead to these degrees. (See page 17.)

Special Students

Physicians and others who would profit by the work may be admitted as special students. Such students are not candidates for a degree.

School of Nursing

Graduation from an approved high school or other preparatory school on the accredited list is a prerequisite for admission. Preference, however, will be given to women of superior preliminary training. Applicants must not be less than twenty, no more than thirty-five, years of age. They must submit to the committee satisfactory evidence of physical and mental fitness and of good character and will undergo a general physical examination by the school physician.

Upon receipt of credentials at the registrar's office, applicants will be notified with regard to the details of registration.

All applicants matriculated will be required to take the preliminary course of instruction covering a period of six months, and must pass the examinations at its close. This period will be one, not only of preliminary training, but of probation. The faculty reserves the right to pass upon the general fitness of the student to enter the hospital service at the close of that time.

The course in Public Health Nursing is offered to graduate nurses or to members of senior classes of recognized schools of nursing who are recommended by their teaching staffs.

COLLEGE OF DENTISTRY

On account of the limited capacity of the college not more than ninety freshmen can be admitted. Application for admission should be in the registrar's office not later than July 15. Residents of Minnesota will be

given prior consideration for vacancies existing at the date of their application. All applications must be accompanied by a ten-dollar preliminary fee, which will be credited toward the first quarter's tuition, or returned if the applicant is not accepted.

Applicants for admission must present one year of collegiate work in science, literature, and the arts, completed at this or some other recognized college or university. (See Admission to the College of Science, Literature, and the Arts, page 27.) High-school physics or its equivalent must be completed by candidates before admission to the dental course proper.

The predental academic work must include the following:

1. Rhetoric, fifteen quarter (ten semester) credits. At Minnesota this requirement is met by Rhetoric A-B-C.

2. Biology, twelve quarter (eight semester) credits. At Minnesota this requirement is met by Animal Biology 5-6-7.

3. Chemistry, twelve quarter (eight semester) credits, including general chemistry and qualitative analysis. This requirement is met at Minnesota by Chemistry 4-5 and 11.

4. Shop Practice, six quarter (four semester) credits. At Minnesota this requirement is met by Mechanical Engineering 11-12-13.

Those whose predental work has been taken elsewhere than at the University of Minnesota must present to the registrar certified credentials of both preparatory and college work, showing the subjects completed, credits, and grades.

The requirement for admission to the School for Dental Hygienists is graduation from an accredited high school.

SCHOOL OF MINES

1. English, three units.

2. Mathematics: elementary algebra, one unit; plane geometry, one unit.

3. Enough additional work to make in all fifteen units, of which not more than four may be in Group F.

It is recommended that students who desire to enter this school take higher algebra and solid geometry in high school.

Freshmen will be divided into two classes, as follows:

A. Those entering with credits in higher algebra and solid geometry.

B. Those entering without credits in higher algebra and solid geometry. Students in Class B will carry a special course in mathematics during their freshman year.

COLLEGE OF PHARMACY

1. English, four units; or English, three units, and a foreign language, two units.

2. Mathematics: elementary algebra, one unit; plane geometry, one unit.

3. Latin, one unit.

4. Enough additional work to make in all fifteen units, of which not more than four may be in Group F.

Prospective students in pharmacy are urged to secure high-school preparation in each of physics, chemistry, botany, and physiology.

Owing to the limited capacity of this college not more than sixty freshmen can be admitted. Applications for admission should be in the registrar's office not later than August 1.

SCHOOL OF CHEMISTRY

Arts and Chemistry Course (five years)

Students entering this course matriculate in the College of Science, Literature, and the Arts and must meet the requirements for entrance to that college. (See page 27.)

Four-Year Course and *Chemical Engineering* (five years)

1. English, three units.
2. Mathematics: elementary algebra, one unit; plane geometry, one unit.
3. Enough additional work to make in all fifteen units, of which not more than four may be in Group F.

High-school students desiring to enter this college are urged to take higher algebra. If they enter the University with a deficiency in this subject, they will be required to take the course in the University without credit before they can proceed with the work that depends upon it. Physics and one-half unit of solid geometry are also recommended.

COLLEGE OF EDUCATION

Applicants for admission to this college must present credentials showing (1) the completion of a regular four-year high-school course; and (2) the completion of two full years of collegiate work (not less than ninety quarter credits) in science, literature, and arts at this or some other college or university of equal rank.

Graduation from advanced graduate normal courses (two years beyond the high school) is considered equivalent to (1) and (2) above.

Graduates of a five-year normal course, if individually recommended by the normal-school president, are allowed sixty-three quarter credits and are admitted as unclassed students pending the completion of twenty-seven additional credits.

Graduates of the three-year course in the state normal schools of Minnesota may receive not more than one hundred and thirteen quarter credits; credits earned in the three-year normal school course shall be applied, in case they are deemed of equivalent merit, in the College of Education, to courses leading to certificates for supervisors in elementary grades, as principals in state graded schools, as teachers in junior high schools or in normal school departments in high schools; students coming from the three-year course in normal schools shall not receive certificates in high-school subjects from the University without completing the prescribed courses of the University for such certificates.

SCHOOL OF BUSINESS

Candidates for admission to the degree courses offered by this school must have completed the two-year prebusiness course in the College of Science, Literature, and the Arts of this University, or its equivalent in some other recognized college or university. (See admission to the College of Science, Literature, and the Arts, page 27.)

Regularly enrolled students in other schools or colleges of the University may be admitted to courses in the school for which they have the prerequisites. Such students are urged to select their business subjects in accordance with a definite plan and as far as possible to complete a systematic course of business study.

Permission to enter as special students may be obtained from the dean in the case of mature business men and women, and of graduates of accredited high schools, with tested executive experience, who are not candidates for a degree. In order to become candidates for a degree, such students must satisfy all the requirements for admission to the degree course.

ADMISSION AS UNCLASSED STUDENTS

Only by permission of the proper officers and upon the presentation of satisfactory reasons for not taking the regular course will an applicant be admitted as an unclassed student. He must take the same examinations or present the same credentials as are required of those who enter as regular students. Exceptions can be made only upon vote of the appropriate faculty. A new application must be made each quarter to the committee in charge. No unclassed student shall be admitted to the School of Mines.

ADMISSION TO ADVANCED STANDING

1. *From Other Colleges*

This University accepts credits from all reputable colleges and universities toward advanced standing. Such credits are accepted as far as they represent courses equivalent to those offered in this institution. The certified record of courses taken in other institutions must be upon the official blank of the institution granting the certificate and should show:

(a) The subject studied, the catalog course number, and the descriptive title.

(b) The number of weeks and hours a week spent upon each subject.

(c) The value of the course expressed in credits.

(d) The result. The exact grades should be stated, accompanied by an explanation of the marking system employed.

(e) A letter or statement of honorable dismissal.

Upon receipt of the student's credentials the registrar will notify the applicant concerning his classification and will send directions for registration.

All statements concerning advanced standing and classification are provisional, subject to the satisfactory completion of one year's work at the University by the applicant.

Candidates wishing to gain advanced standing by examination are allowed examinations without charge, provided such be taken within six weeks after matriculation.

2. *From Minnesota Normal Schools*

Graduates of the Advanced Graduate Course of a Minnesota state normal school are admitted to the College of Science, Literature, and the Arts with one year (forty-five quarter credits) of advanced standing. Graduates of such advanced courses are admitted to the College of Education with an allowance of ninety quarter credits towards graduation.

Individual graduates of the Advanced Latin Course (five-year) or of the Advanced English Course (five-year) of a Minnesota state normal school who, on the basis of maturity and ability, present certificates of special fitness from the president of the normal school, will be admitted to the College of Science, Literature, and the Arts with forty-five quarter credits of advanced standing. Graduates of such courses are admitted to the College of Education with an allowance of sixty-three quarter credits towards graduation.

Graduates of the three-year course in the state normal schools of Minnesota may receive not more than one hundred and thirteen credits in the College of Education; credits earned in the three-year normal school course shall be applied, in case they are deemed of equivalent merit, in the College of Education, to courses leading to certificates for supervisors in elementary grades, as principals in state graded schools, as teachers in junior high schools or in normal school departments in high schools; students coming from the three-year course in normal schools shall not receive certificates in high-school subjects from the University without completing the prescribed courses of the University for such certificates. No credit is allowed for this course in the College of Science, Literature, and the Arts.

State normal schools at the following places are recognized: Duluth, Mankato, Moorhead, St. Cloud, Winona, Bemidji.

3. *Junior Colleges*

In accordance with the policy of the University to encourage able schools to give one or two years of college work, the University Senate has prescribed conditions under which such work may be recognized for advanced standing. Copies of these standards may be had upon inquiry at the registrar's office. The following schools in Minnesota have complied with the requirements: Concordia College, St. Paul; Hibbing Junior College; Park Region Luther College, Fergus Falls; Rochester Junior College; St. John's College, Collegeville; Stanley College, Minneapolis; Villa Sancta Scholastica, Duluth; Augsburg Seminary, Minneapolis; St. Benedict's College, St. Joseph; St. Mary's Hall, Faribault; Eveleth Junior College; Winona State Normal School; Pipestone Junior College.

4. *Miscellaneous*

Credit in shop work and drawing will be given in the College of Engineering and Architecture for work in manual training, or for practical experience, provided the applicant gives evidence of proficiency in such work, and is qualified to pursue advanced work. The student must register for the regular work and at the same time make application to the department concerned for advanced credit.

LIST OF ACCREDITED PREPARATORY SCHOOLS

Graduates of the following Minnesota state high schools will be admitted to the University of Minnesota without conditions, provided their credentials satisfy the specific requirements of the college to which entrance is desired:

Ada
Adrian
Aitkin
Akeley
Albert Lea
Alden
Alexandria
Amboy
Annandale
Anoka
Appleton
Argyle
Arlington
Atwater
Aurora
Austin
Bagley
Barnesville
Belle Plaine
Bemidji
Benson
Bird Island
Biwabik
Blackduck
Blooming Prairie
Blue Earth
Brainerd
Breckenridge
Browns Valley
Buffalo
Buhl
Caledonia
Cambridge
Canby
Cannon Falls
Carlton
Cass Lake
Chaska
Chatfield
Chisholm
Clarkfield
Cleveland
Cloquet
Cokato
Coleraine
  Greenway
  Olcott
Cottonwood
Crookston
Crosby-Ironton
Dassel
Dawson
Deer River
Delano
Detroit
Dodge Center
Duluth
  Central
  Denfeld
Eagle Bend
East Grand Forks
Elbow Lake
Elk River
Elmore
Ely
Eveleth
Excelsior
Fairfax
Fairmont
Faribault
Farmington
Fergus Falls
Fertile
Forest Lake
Fosston
Frazee
Fulda
Gaylord
Gilbert
Glencoe
Glenwood
Glyndon
Graceville
Grand Meadow
Grand Rapids
Granite Falls
Hallock
Halstad
Hancock
Harmony
Hastings
Hawley
Hayfield
Hector
Henderson
Herman
Heron Lake
Hibbing
Hinckley

Hopkins
Houston
Howard Lake
Hutchinson
International Falls
Ivanhoe
Jackson
Janesville
Jordan
Kasota
Kasson
Kenyon
Kerkhoven
Lake Benton
Lake City
Lake Crystal
Lake Park
Lakefield
Lamberton
Lanesboro
Le Roy
Le Sueur
Le Sueur Center
Lindstrom-Center City
Litchfield
Little Falls
Long Prairie
Luverne
Lyle
Mabel
McIntosh
Madelia
Madison
Mahnomen
Mankato
Mantorville
Mapleton
Marshall
Melrose
Milaca
Minneapolis
  Central
  East
  North
  South
  West
Minneota
Montevideo
Montgomery
Monticello
Moorhead
Mora
Morris
Morristown
Morton
Mound
Mountain Iron
Mountain Lake
Nashwauk-Keewatin
New Prague
New Richland
New Ulm
North St. Paul
Northfield
Norwood-Young
  America
Olivia
Ortonville
Osakis
Owatonna
Park Rapids
Paynesville
Pelican Rapids
Perham
Pine City
Pine Island
Pine River
Pipestone
Plainview
Preston
Princeton
Proctor
Red Lake Falls
Red Wing
Redwood Falls
Renville
Rochester
Roseau
Royalton
Rush City
St. Charles
St. Cloud
St. Francis
St. James
St. Louis Park
St. Paul
  Central
  Humboldt
  John A. Johnson
  Mechanic Arts
St. Peter
Sandstone
Sauk Center
Sauk Rapids
Shakopee
Sherburn
Slayton
Sleepy Eye
South St. Paul
Spring Grove
Spring Valley
Springfield
Staples
Stephen
Stewartville
Stillwater
Thief River Falls
Tracy
Two Harbors
Tyler
Villard
Virginia
Wabasha
Wadena
Walker
Warren
Waseca
Waterville
Wayzata
Welcome
Wells
West Concord
Wheaton
White Bear
Willmar
Windom
Winnebago
Winona
Winthrop
Worthington
Zumbrota

Graduates of the following private schools will be admitted to the freshman class under the regulations governing the admission of high-school graduates:

Collegeville
- St. John's College

Duluth
- Cathedral High School for Boys
- Cathedral High School for Girls
- Villa Sancta Scholastica

Faribault
- St. Mary's Hall
- Shattuck Military Academy

Fergus Falls
- Park Region Luther College

Frontenac
- Villa Maria

Graceville
- St. Mary's Academy

Hutchinson
- Hutchinson Theological Seminary

Minneapolis
- Blake School for Boys
- Northrop Collegiate Institute
- Minnehaha Academy
- Minnesota College
- St. Margaret's Academy
- Stanley Hall

Montevideo
- Windom Institute

Moorhead
- Concordia College

Owatonna
- Pillsbury Academy

Red Wing
- Academy of the Red Wing Seminary
- Luther Ladies' Seminary

St. Joseph
- Convent of St. Benedict

St. Paul
- Bethel Academy
- College of St. Catherine
- Oak Hall (Backus School for Girls)
- St. Joseph Academy
- St. Paul Academy
- St. Thomas College
- Summit School
- Visitation Convent

St. Peter
- Academy, Gustavus Adolphus College

Winona
- Cathedral High School
- Cotter High School
- St. Claire Seminary
- St. Mary's College

DESCRIPTION OF SUBJECTS ACCEPTED FOR ADMISSION

The following statements indicate in a general way the preparation which the University expects in the various subjects accepted for admission. The number of units in parentheses following each subject indicates the maximum credit accepted by any one college of the University and does not mean that all colleges will accept the maximum stated. See pages 27 to 33 for statements of the requirements of the individual colleges.

GROUP A. ENGLISH

(Three or four units)

In order to secure a definite plan of study and unity of method on the part of preparatory schools, the entrance requirement in English is outlined below somewhat in detail. To satisfy this requirement a course of not less than four hours a week must be pursued during the time specified above. The headings under which instruction will naturally fall are:

I. The principles of rhetoric.
II. Practice in written expression.
III. English classics.

I

The work in the principles of rhetoric should include the principles and technical terms of ordinary texts upon the subjects, whether acquired by the direct study of such text or mainly by the study of selected English masterpieces. It should not be forgotten that this is not an end in itself, but simply a means of teaching the student the correct use of English.

II

Not less than an hour a week in each of the four years of the course should be devoted to work in composition, which should be criticized both orally and in writing by the teacher. Such subjects should be chosen as will best make this written work an expression of the lives and interests of the students, who should be taught to observe accurately, think logically, and write correctly and forcefully.

III

The preparation in English Literature should consist in the study of a limited number of English classics and in the reading of a larger number. The following lists of books, headed respectively *reading* and *study*, are quoted from the report of the National Conference on Uniform Entrance Requirements in English. They will be found suggestive to those preparing students for the University. In connection with both lists, the student should be trained in reading aloud and be encouraged to commit to memory some of the more notable passages both in verse and in prose. As an aid to literary application, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

A. READING.—The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature, by giving him a first-hand knowledge of some of the best authors. He should read carefully the selections prescribed, but should not concentrate his attention upon details to the neglect of the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from which at least ten units are to be selected, two from each group:

Group 1. The *Old Testament*, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther; the *Odyssey*, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII; the *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; Virgil's *Aeneid*. The *Odyssey, Iliad*, and *Aeneid* should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

Group 2. *Shakespeare.—Midsummer Night's Dream; Merchant of Venice; As You Like It; Twelfth Night; The Tempest; Romeo and Juliet; King John; Richard II; Richard III; Henry V; Coriolanus; Julius Caesar;* Macbeth;* Hamlet.**

Group 3. *Prose Fiction.*—Two to be selected.—Malory's *Morte d'Arthur* (about 100 pages); Bunyan's *Pilgrim's Progress*, Part I; Swift's *Gulliver's Travels* (voyages to Lilliput and to Brobdingnag); De Foe's *Robinson Crusoe*, Part I; Goldsmith's *Vicar of Wakefield;* Frances Burney's *Evelina;* Scott's novels (any one); Jane Austen's

* If not chosen for study under (B).

novels (any one); Maria Edgeworth's *Castle Rackrent,* or *The Absentee;* Dickens' novels (any one); Thackeray's novels (any one); George Eliot's novels (any one); Mrs. Gaskell's *Cranford;* Kingsley's *Westward Ho!* or *Hereward, the Wake;* Reade's *The Cloister and the Hearth;* Blackmore's *Lorna Doone;* Hughes's *Tom Brown's School-days;* Stevenson's *Treasure Island,* or *Kidnapped,* or *Master of Ballantrae;* Cooper's novels (any one); Poe's selected *Tales;* Hawthorne's *The House of the Seven Gables,* or *Twice-Told Tales,* or *Mosses from an Old Manse;* a collection of *Short Stories* by various standard writers.

Group 4. *Essays, Biography, etc.*—Two to be selected.—Addison and Steele's *The Sir Roger de Coverley Papers,* or selections from the *Tattler* and the *Spectator* (about 200 pages); Boswell's selection from the *Life of Johnson* (about 200 pages); Franklin's *Autobiography;* Irving's *Sketch Book* (about 200 pages), or *Life of Goldsmith;* Southey's *Life of Nelson;* Lamb's *Essays of Elia* (about 100 pages); Lockhart's *Life of Scott* (about 200 pages); Thackeray's lectures on Swift, Addison, and Steele in the *English Humorists;* Macaulay's *Lord Clive, Warren Hastings, Milton, Addison, Goldsmith, Frederick the Great, Madame d'Arblay* (any one); Trevelyan's *Life of Macaulay* (about 200 pages); Ruskin's *Sesame and Lilies,* or selections (about 150 pages); Dana's *Two Years before the Mast;* selections from Lincoln, including at least the two *Inaugurals,* the speeches in Independence Hall and at Gettysburg, the *Last Public Address,* and the *Letter to Horace Greeley,* together with a brief memoir or estimate; Parkman's *The Oregon Trail;* Thoreau's *Walden,* Lowell's *Selected Essays* (about 150 pages); Holmes's *The Autocrat of the Breakfast Table;* Stevenson's *An Inland Voyage,* and *Travels with a Donkey;* Huxley's *Autobiography,* and selections from *Lay Sermons,* including the addresses on *Improving Natural Knowledge, A Liberal Education,* and *A Piece of Chalk;* a collection of essays by Bacon, Lamb, De Quincey, Hazlitt, Emerson, and later writers; a collection of letters by various standard writers.

Group 5. *Poetry.*—Two to be selected.—Palgrave's *Golden Treasury (First Series),* Books II and III with special attention to Dryden, Collins, Gray, Cowper, and Burns; Palgrave's *Golden Treasury (First Series),* Book IV, with special attention to Wordsworth, Keats, and Shelley (if not chosen for study under B); Goldsmith's *The Traveler* and *The Deserted Village;* Pope's *The Rape of the Lock;* a collection of English and Scottish *Ballads,* as, for example, some *Robin Hood* ballads. *The Battle of Otterburn, King Estmere, Young Beichan, Bewick and Grahame, Sir Patrick Spens,* and a selection from later ballads; Coleridge's *The Ancient Mariner, Christabel,* and *Kubla Khan;* Byron's *Childe Harold,* Canto III or IV, and *The Prisoner of Chillon;* Scott's *The Lady of the Lake,* or *Marmion;* Macaulay's *The Lays of Ancient Rome, The Battle of Naseby, The Armada, Ivry;* Tennyson's *The Princess,* or *Gareth and Lynette; Lancelot and Elaine,* and *The Passing of Arthur;* Browning's *Cavalier Tunes, The Lost Leader, How They Brought the Good News from Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City, The Italian in England, The Patriot, The Pied Piper, "De Gustibus"—, Instans Tyrannus;* Arnold's *Sohrab and Rustum,* and *The Forsaken Merman;* selections from *American Poetry,* with special attention to Poe, Lowell, Longfellow, and Whittier.

B. Study.—This part of the requirement is designed to insure a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. The books provided for study are arranged in four groups, from each of which one selection is to be made.

(1) Shakespeare's *Julius Caesar, Macbeth, Hamlet.*

(2) Milton's *L'Allegro, Il Penseroso,* and either *Comus* or *Lycidas;* Tennyson's *The Coming of Arthur, The Holy Grail,* and *The Passing of Arthur;* the selections from Wordsworth, Shelley, and Keats, in Book IV of Palgrave's *Golden Treasury (First Series).*

(3) Burke's *Speech on Conciliation with America;* Macaulay's *Two Speeches on Copyright* and Lincoln's *Speech at Cooper Union;* Washington's *Farewell Address* and Webster's *First Bunker Hill Oration.*

(4) Carlyle's *Essay on Burns,* with a selection from Burns's *Poems;* Macaulay's *Life of Johnson;* Emerson's *Essays on Manners.*

GROUP B. LANGUAGES

Latin

1. Work of the first year should comprise: drill in the fundamentals of grammar as contained in any good first-year Latin book; forms to be thoroly mastered; constant practice in pronunciation and training for the ear; attention called to English words derived from the Latin words studied.

2. Work of the second year should consist at first of easy passages of continuous prose such as the extracts from Eutropius and the *Viri Romae* in the Beason and Scott or any good second-year Latin book. This may be followed by extracts from Caesar judiciously selected by the teacher. The text from Caesar may be varied by selections from Nepos or Ovid. The use of a good second-year book is recommended rather than a straight text of Caesar. Elementary composition should be given during the year and the relation between Latin and English emphasized. The total amount of text for the year might approximate the amount contained in the first three books of Caesar.

3. The third year may be well spent on Cicero's *Orations* with perhaps some of his selected letters. The amount usually covered may be indicated by saying that any six from the following list seem satisfactory: *Against Cataline, Poet Archeas, Ligarius, Marcellus, Manillian Law* (to count as two), *The Fourteenth Philippic.*

4. Virgil is usually read the fourth year. If a teacher prefers to read five rather than six books the fifth may be omitted. A pupil's feeling for adequate renderings of the poetic expression of the Latin should be cultivated. Constant metrical reading of the text is advocated as soon as the mechanics of the meter have been mastered.

In place of the above, the University will accept the work recommended in the report of the Cleveland Commission on College Entrance Requirements in Latin.

Greek

Greek Grammar (one unit).—The work of the first year should include the study of forms, inflections, word formation, principles of syntax, elementary composition and reading. The contents of White's *First Greek Book* represents approximately the ground which the student is expected to cover.

Xenophon's *Anabasis* (one unit).—The work of the second year should comprise a careful reading of four books of the *Anabasis,* or an equivalent amount of Greek prose, together with the study of syntax, etymology, and the irregular verb. Emphasis should also be laid upon a correct pronunciation.

German (four units)

In the first year the student should acquire:

1. Correctness and ease of pronunciation; the ability to read from the text with the proper sentence accent.

2. A vocabulary of a thousand words in every-day use; facility in expressing his thoughts in simple sentences. As a means to this, at least 150 pages of narrative prose, and some poetry, should be read. Using the subject matter of the daily reading lesson as a basis, the teacher should, through rapid question and answer, develop the student's power of self-expression in the foreign idiom.

3. The essentials of German grammar, to be taught inductively in conjunction with the oral development of the reading lesson indicated in (2). Toward the last of the year the essentials should be reviewed with accuracy and in detail, with the help of sentences and free composition. Some free composition, or written answers to questions, should be required frequently after the first weeks.

In the second year the student should:

1. Read 200-300 pages of prose and poetry. The better students should be encouraged to private reading of simple texts. The use of classics in the second year is discouraged. A very simple text should be chosen for the first weeks to make the transition from the beginning course less abrupt. Other texts should follow of which the language is sufficiently modern to lend itself well to oral treatment of the subject matter in class. This course should continue the effort of the first year to develop,

by means of question and answer in German, the accurate and immediate knowledge of the language through direct imitation and spontaneous use of the idiom of the text. This work should be supported by frequent written exercises based upon the text read.

2. Translate selected passages of the text into idiomatic English. To translate sentences which the student already understands is a waste of time. Usually a paraphrase, or a brief explanation in German, of a difficult passage is more satisfactory than translation.

3. Review topically the essentials of German grammar, including the chief rules of orthography and syntax.

Students presenting three or four years of high-school German may enter University courses suited to their degree of advancement. The work of the third and fourth years should secure grammatical accuracy, enlarge the reading and speaking vocabulary, and provide an introduction to the literature. To this end the use of much good narrative prose and selected poetry in the third year is recommended, and the reading and discussion of several dramas including classics, in the fourth year. Selection of too difficult texts is a serious error and should be avoided.

French (four units)

Work of the first year should comprise:

1. Careful drill in pronunciation.
2. Rudiments of grammar, including inflection of the more common irregular verbs.
3. Abundant practice in turning simple English into French.
4. Reading of 100 to 175 pages of simple French, including ample practice in sight translation.
5. Writing of French from dictation.

Work of the second year should comprise:

1. Complete and thoro drill in grammar.
2. Drill in connected prose composition.
3. Reading of 250 to 400 pages of modern prose and poetry.
4. Continued practice in writing French from dictation.
5. Practice in the understanding of simple French when spoken or read.

Work of the third and fourth years: If a third and fourth year are offered, they should consist of (1) continued study of grammar, (2) advanced connected prose composition, (3) reading of more difficult French with emphasis on the literary side, and (4) oral practice.

Spanish (four units)

Courses in Spanish should follow the same plan as for French.

Scandinavian Languages

Norwegian or *Swedish* (four units).—The student should acquire the principles of grammar, ability to read and translate ordinary prose and easy poetry as well as to translate from English, and a fair acquaintance with the history of the Scandinavian countries. Two additional years' work in literature will be accepted.

GROUP C. HISTORY AND SOCIAL SCIENCES

History

Ancient History (one unit).—This study should begin with a brief survey of the oriental peoples who have most influenced European development, and should be carried down to the establishment of Charlemagne's empire.

Modern History (one unit).—From Charlemagne to the present. It is desirable to give at least one third of the year to the period from 1789.

English History (one-half or one unit).—The Saxon period should be passed over rapidly. In the remainder of the work, besides the narrative, constitutional points should receive attention, and easily accessible documents should receive careful study.

Senior American History (one-half or one unit).—No attempt should be made to cover the whole field in this time. In the study of any period in the nineteenth century special attention should be paid to economic development and the westward movement.

Social Sciences

American Government (one-half or one unit).—This should be a study of our government, national, state, and local, as it is organized and actually operated to-day. The instruction should aim to impart information essential to intelligent, active citizenship, such as the division of the government into departments, their organization and function; the methods of nominating, electing, and appointing men to office; of framing and amending constitutions, city charters, and statutes; of drawing grand and petit juries and the duty of the citizen to serve on them; the distinction between common law, state law, and constitutional law, between equity, civil, and criminal cases.

Elementary Economics (one-half unit.)—In the study of economics it is desirable to avoid two extremes, abstract theory on the one hand, and controversial questions, such as the tariff, trusts, and trade unions, on the other hand. Emphasis should be placed on historical and descriptive matter, especially relating to the economic development of England and the United States. Some good elementary textbook should be mastered and a reasonable amount of collateral reading required.

History of Commerce (one-half or one unit).—This forms the natural introduction to the study of present economic conditions. It would be well to give special attention to the economic history of England and the United States. The work should be based on a textbook, supplemented by carefully directed map work and assigned readings. This should be preceded by a year course of medieval and modern European history.

Commercial Geography (one-half or one unit).—This describes and seeks to explain the commerce of to-day. The work should cover the ways in which commerce depends on nature and on man, the development of means of transportation and communication, and a detailed study of the several commercial regions of the world with reference to resources, industries, transportation facilities, and commerce. It should be based on a textbook supplemented by map work and assigned readings.

GROUP D. MATHEMATICS

Elementary Algebra (one unit).—Positive and negative numbers; addition; subtraction; multiplication; division; factoring; highest common divisor and lowest common multiple by factoring; fractions; equations of the first degree in one, two, and three unknowns, with numerous problems involving such equations; involution (omitting the binomial theorem); evolution (omitting cube root); elementary manipulations of surds; irrational equations that lead to equations of the first degree; pure quadratic equations; affected quadratic equations by the method of completing the square and by factoring, with problems involving such equations.

Higher Algebra (one-half unit).—A review of elementary algebra with more difficult problems and with some demonstrational work; the factor theorem; the binomial theorem for positive integral exponents; cube root; fractional negative, and zero exponents; surds, radicals, and imaginaries; the solution of affected quadratic equations by formula; equations in the quadratic form; simultaneous quadratic equations; arithmetic and geometric progressions. The course in higher algebra should be taken by students in their third or fourth high-school year.

Plane Geometry (one unit).—Any of the standard texts on this subject will furnish the necessary preparation. Isoperimetry, symmetry, and maxima and minima of figures are not required. The exercises requiring solutions and demonstrations should not be omitted.

Solid Geometry (one-half unit).—Any of the standard texts on this subject will furnish the necessary preparation. The exercises requiring solutions and demonstrations should not be omitted.

GROUP E. NATURAL SCIENCES

Physics (one unit).—It is suggested that the year's work be confined to four of the seven subjects mentioned below.

(1) Mechanics of solids, (2) liquids and gases, (3) sound, (4) heat, (5) light, (6) and (7) electricity and magnetism (to count as two subjects, but not to be divided).

Chemistry (one unit).—The full year's work should include a study of both the non-metals and metals with laboratory experiments illustrating the common chemical laws and the commoner chemical reactions.

Botany (one-half or one unit).—One-half unit: The course should cover the external form and functions of the parts of the flowering plant, including its development from the seed. A part of the work should consist of becoming familiar with the common plants of the neighborhood, both cultivated and native.

One unit: In addition to the work required for one-half unit the course should embrace the microscopic structure of the parts of the flowering plant and a study of selected lower forms. The one year's course should embrace essentially what is covered by Bergen's *Elements of Botany,* Andrew's *Plants the Year Around,* and J. G. Coulter's *Plant Life and Plant Uses.*

Zoology (one-half or one unit).—Animals should be studied as living units in their relation to one another and their environments. This study should include development stages as well as the habits, general structure, and special adaptations of the adult stage. The aim of the teacher should be to foster a love for animate nature and to develop accuracy in observation and description.

Physiology (one-half unit).—A good recent text should be used. Illustrative material, such as skeleton, manikin, and charts, should be available. Single experiments should be carried out, particularly on the students themselves. Practical application and hygiene should be emphasized.

Astronomy (one-half unit).—An elementary course in general astronomy as presented in any good modern textbook will satisfy this requirement.

Geology (one-half unit).—These subdivisions should receive special attention: physiographic geology, the building of the land and the evolution of its existing contours; geodynamics, the modifying of the earth by atmosphere, water, terrestrial heat, plants, and animals, and a brief survey of historical geology.

Physiography (one-half unit).—The following topics should be emphasized: meteorology, the leading facts relating to the atmosphere and its phenomena, including some acquaintance with the work of the United States weather bureau; land sculpture, including the origin, development, and degradation of land forms; and the influence of these processes on the physical environment of man.

General Science (one unit).—The course should consist of an elementary study of the applications of science to the affairs of the every-day life. Such topics as atmosphere and the weather, house-heating and ventilation, foods, water supply, hygiene, and disease preventions are types of the topics which should make up the course. It is not intended that the course should be organized like the special science and it should not be organized with the idea of preparing students for work in the special sciences. The justification of the course must be in terms of its own intrinsic value as a training for life. This point of view is expressed in most of the late textbooks on general science.

GROUP F. VOCATIONAL AND MISCELLANEOUS SUBJECTS

The studies of Group F are no longer designated by the University. This group contains all subjects not listed in the Groups A, B, C, D, and E, which are certified by the high-school superintendent as of acceptable nature and counted towards the graduation of the student.

DEGREES

The candidate for a degree must complete the requirements for graduation in his course. Any person may undergo, at a suitable time, an examination in any subject, and if such person pass in all the studies and exercises of the course, he is entitled to the appropriate degree; provided, however, that at least one full year (the one immediately preceding the granting of the degree) is spent at the University, before such degree is granted, and provided further that the examination, in every case, is held before a committee of the faculty appointed for that purpose.

For detailed information concerning requirements, see pages 13-20; also the bulletin of the appropriate college or school.

THE UNIVERSITY STATE TEACHERS' CERTIFICATE

The University State Teachers' Certificate is granted to graduates of the College of Education. This certificate by state law authorizes students to teach in the public schools of Minnesota for two years from date of issue. After that time, upon satisfactory evidence of the student's successful teaching experience, the certificate may be made permanent by the endorsement of the commissioner of education and the president of the University.

EXPENSES

FEES

TUITION FEE

The university year, extending from October to June, is divided into three terms called quarters, the summer session of six weeks in June and July being considered as the fourth quarter. The tuition fee, which includes all laboratory charges (except in the School of Chemistry), is payable at the beginning of each quarter.

The quarterly tuition fees for the several schools and colleges of the University are as stated below:

College of Science, Literature, and the Arts:

Quarterly fee, resident	$ 20.00
Quarterly fee, non-resident	30.00
Additional quarterly fee for those electing music:	
Instrumental and vocal (one lesson a week)	25.00
Instrumental and vocal (two lessons a week)	45.00

College of Engineering and Architecture:

Quarterly fee, resident	$ 30.00
Quarterly fee, non-resident	40.00

College of Agriculture, Forestry, and Home Economics:

Quarterly fee, resident	$ 20.00
Quarterly fee, non-resident	30.00

Law School:

Quarterly fee, resident	$ 30.00
Quarterly fee, non-resident	40.00

Medical School:

Quarterly fee, resident	$ 60.00
Quarterly fee, non-resident	70.00
School of Nursing, preliminary course, tuition fee	25.00

College of Dentistry:

Quarterly fee, resident	$ 60.00
Quarterly fee, non-resident	70.00

School of Mines:

Quarterly fee, resident	$ 30.00
Quarterly fee, non-resident	40.00

College of Pharmacy:

Quarterly fee, resident	$ 30.00
Quarterly fee, non-resident	40.00

School of Chemistry:

Quarterly fee, resident ..... $ 30.00
Quarterly fee, non-resident 40.00

College of Education:

Quarterly fee, resident ..... $ 20.00
Quarterly fee, non-resident 30.00

School of Business:

Quarterly fee, resident ..... $ 30.00
Quarterly fee, non-resident 40.00

Graduate School:

Quarterly fee, resident and non-resident ..... $ 10.00

DEPOSIT FEE

At the student's first registration each year, in addition to the tuition fee, a deposit fee of five dollars ($5.00) (Medicine and Dentistry, ten dollars) is required of every student to cover the following possible charges:

Change of registration $2.50
Examination for removal of condition at set time or postponed physical examination $1.00
Rental of post-office box, University post-office (required of all) ..... $0.50 a year
Locker rental, locker key deposit ..... $0.50 to $1.00 a year
Case-book deposit (Law School), laboratory breakages, or damage to University property.
Penalties for late registration or late payment of fees.

A penalty fee of five dollars ($5.00) must be paid by all students who register or pay fees after the prescribed time. (See calendar, page 7.) After the day previous to that on which classes begin, the penalty for delay increases at the rate of one dollar a day.

The unused balance of the deposit fee will be returned at the end of each year. If, at any time during the college year, the charges against a student shall warrant a renewal of the deposit, a second fee of five dollars ($5.00) will be required.

A laboratory deposit of five dollars ($5.00) is also required of students registered for courses in Chemistry to cover the cost of materials; the unused balance will be returned at the end of the course.

SPECIAL FEES

The following special items are included in the expenses of a student:

Minnesota Union membership (required of men) ..... $0.70 a quarter
Shevlin Hall fee (required of women) ..... .50 a quarter
Health fee (required of everyone) ..... 2.00 a quarter

Gymnasium fee (required of freshman women taking gymnasium courses) ..... 2.50 a quarter
Gymnasium fee (required of upper-class women taking gymnasium courses) ..... 2.00 a quarter

The following special items may be included:

Special examination for removal of condition, at other than the set time* $5.00
Examination on subject taken out of class* 5.00
(No fee for such examination on first entering the University, if taken within the first six weeks.)
Gymnasium suit, men and women (approximately) 8.00

STUDENTS EXEMPT FROM FEES

All fellows, scholars, assistants, and instructors, and all members of the teaching staff and scientific bureaus or experiment stations when regularly enrolled as students in the Graduate School shall not be required to pay tuition fees.

FEES FOR STUDENTS OF ONE COLLEGE TAKING WORK IN ANOTHER

Where a student of a given college or school elects courses in another, such courses being accepted by the college in which the student is registered as a part of its curriculum, the tuition shall be that of the college in which he is registered.†

If, at any time, such student desires credit for this course towards the degree offered by the second college, he shall pay such additional tuition as is required by the second college, charged in accordance with the schedule indicated below.

FEE SCHEDULE FOR STUDENTS CARRYING LESS THAN FULL WORK

Students carrying less than the complete schedule of work may pay fees on a credit-hour basis. The following table indicates the charge for each college, also the minimum amount that may be paid by any student.

College or School	Credit Hour Fee	Minimum Total
Science, Literature, and the Arts	$2.50	$ 5.00
Engineering and Architecture	3.50	10.00
Agriculture, Forestry, and Home Economics	2.50	5.00
Law	4.25	10.00
‡Medicine	3.00	10.00
‡Dentistry	3.00	10.00

* Such an examination may be taken only upon approval of the appropriate committee.

† A student paying full fees in a given college, electing courses in a lower-fee college, shall pay no additional fees for the work so elected, but if electing in a higher-fee college may have the option of paying the pro rata fees of both or the full fees of the first and pro rata fees of the second.

‡ In these three colleges the prorating is on the basis of clock hours.

College or School	Credit Hour Fee	Minimum Total
Mines	3.50	10.00
‡Pharmacy	1.50	10.00
Chemistry	3.50	10.00
Education	2.50	5.00
Graduate School	1.25	5.00

LIVING EXPENSES

BOARD AND ROOM

Women

Sanford Hall.—Sanford Hall, the one dormitory for women, accommodates eighty-seven women, about one third of whom may be freshmen. The charge for room and board is three hundred dollars ($300) for the university year. The rooms are all engaged for the coming year. The addition to the dormitory, soon to be under construction, will accommodate one hundred women. This building will not be available before March, 1921.

Coöperative Cottages.—Two coöperative cottages, each in charge of a chaperone, offer comfortable homes for about twenty-six women. One cottage, the Elizabeth Northrop, is for the exclusive use of woman medical students. By assisting with the work of the houses, the students are able to keep expenses within moderate bounds. In assigning students to these cottages, preference is given to women earning a part of their expenses. These rooms are all engaged at the present time. Occasionally a vacancy occurs. Application may be made to the dean of women.

Home Management Houses.—Two residences for women, located near the Agricultural College campus, are maintained by the Division of Home Economics, furnishing accommodations for a small number of students. The charge is ninety dollars ($90) for each quarter, payable in advance. This sum covers the cost of living in the houses with the exception of luncheons for the first five days of the week. Applications should be sent to the Chief of the Division of Home Economics, University Farm, St. Paul. A deposit fee of ten dollars ($10) is required when a room is reserved.

Rooming Houses.—About one hundred houses are approved by the University as residences for women. Attention is called to the ruling of the Board of Regents that woman students are not allowed to reside in any house which is not on the approved list except by special arrangement with the dean of women. Woman students do not reside in any house where men are taken as roomers. All woman students should bring at least three sheets, two pillowcases, and towels, all to be marked with the full name of owner. No electric light stronger than forty watt is to be allowed in a student's room. No electric appliances are to be

‡ In these three colleges the prorating is on the basis of clock hours.

used except by permission of the householder. Room rent varies from eight to fifteen dollars a month; board at the present time is seven dollars a week.

Three meals on the cafeteria plan are served at Shevlin Hall daily, with the exception of Sunday.

For further information and lists of addresses, application may be made to the dean of women.

Men

A list of approved boarding and rooming houses may be had upon request at the Bureau of Information and Employment.

At the Minnesota Union, the men's club house on the campus, three meals a day are served on the cafeteria plan, at practically cost prices. Last year (1919-20) the average price paid for breakfast was twenty cents; for luncheon and dinner, thirty cents each. Board by the week varies from five to seven dollars a week.

GENERAL EXPENSES—ESTIMATED ON THE BASIS OF THREE QUARTERS

Formerly the "college year" extended from September to June, covering approximately nine months. Since the adoption of the quarter system and the introduction of the Summer Quarter, what was known as the "college year" is now embraced in *three quarters,* and as this period will for many students still be their "college year," expenses have been estimated on that basis.

The following tables give estimates of the freshman student's expenses in college, omitting clothing, railroad fare, and vacation expenditures. To live within the minimum rate, a student must forego all luxuries and economize in every expenditure.

Colleges of Science, Literature, and the Arts; Education; Agriculture, Forestry, and Home Economics

	Minimum	Average	Liberal
*Tuition	$60.00	$60.00	$60.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
†Minnesota Union fee	2.10	2.10	2.10
Gymnasium suit (approximately)	8.00	8.00	8.00
Books	20.00	25.00	30.00
Laundry	28.00	36.00	60.00
Room rent	70.00	100.00	120.00
Board	175.00	225.00	325.00
Incidentals	60.00	200.00	300.00
	$434.10	$667.10	$916.10

* Tuition fee for students residing outside of the state of Minnesota is $90.00.

† For woman students, substitute for Minnesota Union fee the Shevlin Hall fee amounting to $1.50.

Funds absolutely necessary for immediate expenses upon entering these colleges, including two weeks' board and first month's room rent in advance: minimum, $85.00; average, $90.00.

COLLEGE OF ENGINEERING AND ARCHITECTURE

	Minimum	Average	Liberal
*Tuition	$90.00	$90.00	$90.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
†Minnesota Union fee	2.10	2.10	2.10
Books and instruments	50.00	60.00	75.00
Laundry	28.00	36.00	60.00
Board	175.00	225.00	325.00
Room rent	70.00	100.00	120.00
Incidentals	60.00	200.00	300.00
	$486.10	$724.10	$983.10

* Tuition fee for students residing outside of the state of Minnesota is $120.00.

† For woman students, substitute for Minnesota Union fee the Shevlin Hall fee amounting to $1.50.

Necessary for immediate expenses upon entering this college, including two weeks' board and first month's room rent in advance: minimum, $110.00; average, $130.00.

LAW SCHOOL

	Minimum	Average	Liberal
*Tuition fee	$90.00	$90.00	$90.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
†Minnesota Union fee	2.10	2.10	2.10
Books and notebooks	10.00	16.50	18.50
Laundry	28.00	36.00	60.00
Room rent	70.00	100.00	120.00
Board	175.00	225.00	325.00
Incidentals	60.00	200.00	300.00
	$446.10	$680.60	$926.60

* Tuition fee for students residing outside of the state of Minnesota is $120.00.

† For woman students, substitute for Minnesota Union fee the Shevlin Hall fee amounting to $1.50.

Necessary for immediate expenses upon entering this school, including two weeks' board and first month's room rent in advance: minimum, $75.00; average, $80.00.

Medical School

	Minimum	Average	Liberal
*Tuition	$180.00	$180.00	$180.00
Deposit fee	10.00	10.00	10.00
Health fee	6.00	6.00	6.00
†Minnesota Union fee	2.10	2.10	2.10
Books and instruments	27.50	33.00	50.00
Laundry	28.00	36.00	60.00
Room rent	70.00	100.00	120.00
Board	175.00	225.00	325.00
Incidentals	60.00	200.00	300.00
	$558.60	$792.10	$1053.10

* Tuition fee for students residing outside of the state of Minnesota is $210.00.

† For woman students, substitute for Minnesota Union fee the Shevlin Hall fee amounting to $1.50.

Necessary for immediate expenses upon entering this school, including two weeks' board and first month's room rent in advance: minimum, $120.00; average, $145.00.

College of Dentistry

	Minimum	Average	Liberal
*Tuition	$180.00	$180.00	$180.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
†Minnesota Union fee	2.10	2.10	2.10
Books and instruments	130.00	147.50	175.00
Laundry	28.00	36.00	60.00
Room rent	70.00	100.00	120.00
Board	175.00	225.00	325.00
Incidentals	60.00	200.00	300.00
	$656.10	$901.60	$1173.10

* Tuition fee for students residing outside of the state of Minnesota is $210.00.

† For woman students, substitute for Minnesota Union fee the Shevlin Hall fee amounting to $1.50.

Necessary for immediate expenses upon entering this college, including two weeks' board and first month's room rent in advance: minimum, $220.00; average, $245.00.

School of Mines

	Minimum	Average	Liberal
*Tuition	$90.00	$90.00	$90.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00

* Tuition fee for students residing outside of the state of Minnesota is $120.00.

Minnesota Union fee	2.10	2.10	2.10
Books, etc.	22.00	27.50	27.50
Laundry	28.00	36.00	60.00
Room rent	70.00	100.00	120.00
Board	175.00	225.00	325.00
Incidentals	60.00	200.00	300.00
	$458.10	$691.60	$935.60

Necessary for immediate expenses upon entering this school, including two weeks' board and first month's room rent in advance: minimum, $100.00; average, $115.00.

Sophomores will include in the year's expenses from $100.00 to $150.00 to cover field work from May 1 to July 1. Juniors will include from $175.00 to $250.00 to cover field work from May 1 to July 1.

College of Pharmacy

	Minimum	Average	Liberal
*Tuition	$90.00	$90.00	$90.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
†Minnesota Union fee	2.10	2.10	2.10
Books and instruments	15.00	17.00	19.00
Laundry	28.00	36.00	60.00
Room rent	70.00	100.00	120.00
Board	175.00	225.00	325.00
Incidentals	60.00	200.00	300.00
	$451.10	$681.10	$927.10

* Tuition fee for students residing outside of the state of Minnesota is $120.00.

† For woman students, substitute for Minnesota Union fee the Shevlin Hall fee amounting to $1.50.

Necessary for immediate expenses upon entering this college, including two weeks' board and first month's room rent in advance: minimum, $95.00; average, $110.00.

School of Chemistry

	Minimum	Average	Liberal
*Tuition	$90.00	$90.00	$90.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
†Minnesota Union fee	2.10	2.10	2.10
Gymnasium suit	8.00	8.00	8.00
Books and instruments	15.00	17.00	19.00
Laundry	28.00	36.00	60.00
Room rent	70.00	100.00	120.00
Board	175.00	225.00	325.00
Incidentals	60.00	200.00	300.00
	$459.10	$689.10	$935.10

* Tuition fee for students residing outside of the state of Minnesota is $120.00.

† For woman students, substitute for Minnesota Union fee the Shevlin Hall fee amounting to $1.50.

Necessary for immediate expenses upon entering this school, including two weeks' board and first month's room rent in advance: minimum, $95.00; average, $110.00.

School of Business

	Minimum	Average	Liberal
*Tuition	$90.00	$90.00	$90.00
Deposit fee	5.00	5.00	5.00
Health fee	6.00	6.00	6.00
†Minnesota Union fee	2.10	2.10	2.10
Books	15.00	20.00	25.50
Laundry	28.00	36.00	60.00
Room rent	70.00	100.00	120.00
Board	175.00	225.00	325.00
Incidentals	60.00	200.00	300.00
	$451.10	$684.10	$933.60

* Tuition fee for students residing outside of the state of Minnesota is $120.00.

† For woman students, substitute for Minnesota Union fee the Shevlin Hall fee amounting to $1.50.

Necessary for immediate expenses upon entering this school, including two weeks' board and first month's room rent in advance: minimum, $95.00; average, $110.00.

SELF SUPPORT

The Bureau of Employment is maintained for the purpose of assisting all students who seek employment, and of developing in all proper ways opportunities for self-help. The opportunities for men are necessarily more varied than those for women. Communications from students

and graduates in regard to obtaining employment should be addressed to this bureau. Students or prospective students applying for the first time must appear at the office in person.

For the benefit of those who are without support of any kind it may be said that a number of students, with the aid of the money saved during the summer, are earning all their college expenses. Some are able to meet their expenses during the college year, but this can be done only by students of unusual force and adaptability, or with exceptional opportunities. The average student must meet stern competition; he must live economically; he must guard his health while preserving a fair balance between time given to studies and to outside work.

It is not a good policy to begin life in a new community entirely without resources. A prospective student should have at least one hundred and fifty dollars or the equivalent in addition to tuition fees; even then it will be necessary for him to do outside work and live very economically. Before he can place himself in a self-supporting position he may have to try again and again, and meanwhile his living expenses will be accumulating. An adequate reserve fund under such conditions will secure peace of mind, health of body, and the benefits of the college year.

The Twin Cities offer exceptional opportunities to the self-supporting student. Students are employed in housework, in the care of children, and as clerks, bookkeepers, stenographers, salesmen and saleswomen, solicitors, telegraph operators, mechanics, assistants, musicians, librarians, waiters, laborers, janitors, telephone operators, and in many other capacities. Considerable work can be secured within walking distance.

Applicants for employment should bear in mind that, while every effort is made to secure work for all who need it, positions can not be assigned in the order in which applications are made. The places available are of so varied a nature that it would be impossible to assign them in order, without regard to the ability and qualifications of different applicants. The employer must be given the best person for his particular position. This means that fitness must be the first consideration. Whenever possible, however, the order of applications is followed.

Those who find themselves without funds at the beginning of the college year should register in some of the evening extension courses and seek employment during the day rather than run the risk of not being able to finance themselves while carrying regular university work. By choosing extension courses for which university credit is allowed, students can make their future university course much easier and give themselves more time for outside work. The correspondence courses offered by the Extension Division are open to all except resident students. Students who can meet the usual requirements for college entrance are allowed university credit for the most of these courses.

SCHOLARSHIPS, LOANS, AND PRIZES

GRADUATE FELLOWSHIPS AND SCHOLARSHIPS

The Shevlin Fellowships

Four annual Shevlin Fellowships of $500 each are open to graduates of any acceptable college or university, one each in the Colleges of Agriculture, Chemistry, Medicine, and Science, Literature, and the Arts, respectively. Applications for these fellowships must be made on or before March 1. Blank applications can be obtained from the dean of the Graduate School.

The Class of 1890 Fellowship

As a gift of the class of 1890 the annual income from the sum of $2,500 is open to a graduate of the College of Science, Literature, and the Arts or the College of Engineering and Architecture of the University of Minnesota who has shown distinguished ability and initiative as a student and who desires to make further preparation for public service.

The Albert Howard Scholarship

This scholarship of $120 a year is awarded to graduates of the College of Science, Literature, and the Arts of the University of Minnesota.

United States Radiator Corporation Scholarship

A scholarship of $500 is given by the United States Radiator Corporation for special research work in heating. It is available to graduate students in engineering who have taken work in heating and ventilating, and is given for research work in these lines. The holder of this scholarship submits a thesis, and the approval of his work comes under the College of Engineering and Architecture.

The DuPont Fellowship in Chemistry

This fellowship, established by the E. I. DuPont de Nemours and Company, yields $750 annually. The holder devotes his entire time to graduate study and is not required to render any service to the University.

Minneapolis Civic and Commerce Association Scholarship

An annual scholarship of $500, given by the Minneapolis Civic and Commerce Association, is open to graduate students in engineering who have taken work in municipal engineering. The holder will devote part of his time to appropriate work with the Bureau of Municipal Research and will submit a thesis for the approval of the faculty of the College of Engineering and Architecture.

The Northern Insulating Company Scholarship

The Northern Insulating Company of St. Paul offers a scholarship of $500 for research work in heating and insulating materials. The student holding this scholarship must be a graduate of the College of Engineering

and Architecture who has shown special ability along these lines. A thesis must be submitted, the work and thesis to be approved by the College of Engineering and Architecture.

Teaching Fellowships, Assistantships, and Scholarships

The following fellowships, assistantships, and scholarships are open to graduates of any acceptable college or university. They carry stipends ranging from $225 to $1,200 with remission of tuition in the Graduate School. Applications may be made through the dean of the Graduate School on or before March 15.

Agriculture	16 Assistants
Animal Biology	2 Teaching Fellows 2 Scholars
Anthropology	1 Assistant 1 Scholar
Astronomy	1 Scholar
Botany	6 Teaching Fellows
Chemistry	22 Assistants
Comparative Philology	1 Scholar
Economics	2 Teaching Fellows 2 Scholars
Education	4 Assistants 1 Scholar
English	1 Assistant 1 Scholar
Geology and Mineralogy	2 Scholars
German	3 Teaching Fellows 2 Scholars
History	5 Teaching Fellows 2 Assistants 2 Scholars
Mathematics	1 Teaching Fellow 2 Assistants 1 Scholar
*Medicine and Surgery:	
(a) Medical School	16 Fellows 12 Assistants 5 Scholars
(b) Mayo Foundation	107 Fellows
Philosophy	1 Scholar
Physics	4 Teaching Fellows 10 Assistants
Political Science	2 Scholars
Psychology	6 Teaching Fellows 1 Scholar
Romance Languages	4 Teaching Fellows 1 Scholar
Scandinavian	1 Scholar
Sociology and Anthropology	1 Assistant 2 Scholars

* Special requirements. Address inquiries to dean of the Graduate School.

UNDERGRADUATE SCHOLARSHIPS

The Moses Marston Scholarship in English

This scholarship, the annual income from a fund of $1,000, is to be used to further English study, and is awarded by the English Department as a recognition of special capacity for literary and linguistic studies.

National City Bank Scholarships

The National City Bank of New York City offers to students of the University one or more scholarships each year for the purpose of training young men in banking and foreign trade. The arrangements will include certain periods of practical work and study in the National City Bank. Further information may be had from the office of the School of Business. Applications must be in the hands of the dean of this school by March 1.

Minnesota State Pharmaceutical Association Scholarship

A scholarship amounting to $75 is awarded annually by the Minnesota State Pharmaceutical Association to the student, a citizen of the United States and a resident of Minnesota for at least five years, who has earned the highest general rating in the work of the second year of the regular course in the College of Pharmacy. If such student should discontinue attendance at the college, the said sum is to be awarded to the student next highest in standing who meets the other requirements.

The Fairchild Scholarship

The Fairchild Scholarship, amounting to $300, is awarded to that first-year student in any of the colleges holding membership in the American Conference of Pharmaceutical Faculties who has had two years of drug store experience, is a high-school graduate, and who passes the best competitive examination to be conducted by or under the auspices of a committee made up of members appointed jointly by the American Pharmaceutical Association, the American Conference of Pharmaceutical Faculties, and the National Association of Boards of Pharmacy. Fuller particulars may be had from the dean of the college.

The Lions Club Scholarship

The Lions Club offers an annual scholarship amounting to $100 which is available for a student in the Americanization training course.

The Elizabeth Carse Scholarship

The Elizabeth Carse Scholarship, amounting to $50 each year, is awarded to a student in the senior class of the College of Education on the basis of scholarship and general efficiency.

The St. Paul College Club Scholarships

The St. Paul College Club offers annually six scholarships of $150 each to woman students. Applications may be made to the dean of women before May 1.

The Minneapolis College Women's Club Scholarship

The Minneapolis College Women's Club offers annually three scholarships of $150 each, to be awarded to women in the junior or senior class. Applications may be made to the dean of women before May 1.

The W. S. G. A. Scholarship

The Women's Self-Government Association of the University offers annually four scholarships of $100 each, to be awarded to women of the junior or senior class. Applications may be made to the dean of women before May 1.

The Faculty Women's Club Scholarship

The Student Section of the Faculty Women's Club offers annually a scholarship of $100, to be awarded to some woman student. Applications may be made to the dean of women before May 1.

The Woman's Club Scholarship

The Arts and Letters Section of the Woman's Club of Minneapolis offers annually a scholarship of $100, to be awarded to a woman student, preferably in the College of Science, Literature, and the Arts. Applications may be made to the dean of women before May 1.

The Nina Morais Cohen Scholarship

The Nina Morais Cohen Scholarship of $100 is awarded annually to a woman student of Jewish descent. Applications must be made to the dean of women before May 1.

The George H. Partridge Scholarships

Through the generosity of Mr. George H. Partridge several scholarships, amounting to $500 annually, are available for young women of high scholarship and fine character. These scholarships are awarded by selection without special application.

The Mrs. Elbert L. Carpenter Scholarships

Through the generosity of Mrs. Elbert L. Carpenter scholarships, amounting to $150 annually, are available for young women of high scholarship and fine character. These scholarships are awarded by selection without special application.

The Mrs. G. C. Christian Scholarship

Through the generosity of Mrs. G. C. Christian a scholarship, amounting to $100 annually, is available for young women of high scholarship and fine character. This scholarship is awarded by selection without special application.

The Argosy Club Scholarship

The Argosy Club offers annually a scholarship of $100 which is awarded to a woman student in the Americanization training course.

The Pathfinder Club Scholarship

The Pathfinder Club offers annually a scholarship of $50 which is awarded to a woman student in the Americanization training course.

The Get Together Club Scholarship

The Get Together Club offers a scholarship of $50, which is available to students of the Division of Home Economics. In awarding it, the character, the scholarship, and the need of the applicant will be considered. Preference will be given to students in the junior and senior classes. Applications for this scholarship may be made to the chief of the Division of Home Economics.

The Phi Upsilon Omicron Scholarship in Home Economics

The Twin City chapter of Phi Upsilon Omicron offers a scholarship of $50, which is available to students of the Division of Home Economics. Any student in the division will be eligible but preference will be given to freshmen and sophomores. The award will be in the hands of a faculty committee; applications should be made to the chief of the Division of Home Economics.

STUDENT EMERGENCY FUND

The Faculty Women's Club Emergency Fund

The Faculty Women's Club has established a small emergency fund to be used for assisting woman students. It is intended that this fund should give help to students who are embarrassed by inability to meet incidental expenses. Applications may be made to the dean of women at any time.

LOAN FUNDS

Unless otherwise stated, all applications for loans should be made to the secretary to the president.

The Gilfillan Trust Fund

The annual income from this fund of $50,000, established by Judge John B. Gilfillan of Minneapolis, is available either as a gift or a temporary loan to worthy students of the University who are residents of Minnesota.

The Elliot Scholarship Loan Fund

The annual income from this fund of $5,000, established by the will of the late Mrs. Mary H. Elliot, is loaned without interest to students in the School of Mines. The financial needs of the applicant, his scholarship, moral character, enthusiasm shown in his work, and promise of usefulness in his profession will be taken into consideration.

The Ludden Estate Loan Fund

The annual income from this fund of approximately $10,000, established by the will of the late John D. Ludden of St. Paul, is available for loans to any student of the University of Minnesota.

The Ludden Real Estate Loan Fund

An annual income of $3,000, derived from real estate willed to the University by the late John D. Ludden of St. Paul, is available for loans to any student of the University of Minnesota.

The Loan Fund for Women Students of the University

This fund was established by Mrs. George Edgar Vincent and the Faculty Women's Club, and is periodically increased by contributions from the Faculty Women's Club. Small loans from this fund are available for woman students of high scholarship and fine character. Applications may be made to the dean of women at any time.

The Minneapolis Colony of New England Women Loan Scholarship

A loan scholarship of $100 is available annually for a woman student of New England birth or ancestry who is a member of the junior or senior class. Applications, accompanied by testimonials, may be made to the dean of women before May 1.

The Minnesota Federation of Women's Clubs Loan Scholarships

The Minnesota Federation of Women's Clubs has charge of three loan scholarships which provide money to be loaned to young women who are residents of Minnesota, the sum borrowed not to exceed $250. These loan scholarships are as follows:

(a) The Lydia Phillips Williams Memorial Scholarship, to be loaned to a woman student in any department of any college of the state.

(b) The Professor Maria Sanford Scholarship, to be loaned to a woman student in some college of the University of Minnesota.

(c) The Annabelle Collins Coe Scholarship, to be loaned to a woman student at the University of Minnesota or in any college of the state.

Before making a request for these loans applicants should obtain consent of parents or guardians. Applications, accompanied by testimonials, may be made to the dean of women before May 1.

The Duluth Branch of the Association of Collegiate Alumnae Loan Scholarship

The Duluth Branch of the Association of Collegiate Alumnae loans each year a scholarship of $300 to a woman student selecting a course which leads to a bachelor's degree in arts, philosophy, science, literature, or education. This loan scholarship is not restricted to students in institutions of this state. Applications should be sent to the dean of women early in the year so that they may be forwarded to the Duluth Branch of the Association of Collegiate Alumnae.

FOR STUDENTS IN THE DEPARTMENT OF AGRICULTURE ONLY

The Ludden Trust Fund

The income from $10,000, a gift of the late John D. Ludden of St. Paul, is available for loans to students in the Department of Agriculture. Application blanks may be obtained from the dean of the Department of Agriculture.

Students' Trust Funds

The class of 1902 and the class of 1916 each has established a fund of $100 which is available for temporary loans to deserving students who are not below the junior class in the School of Agriculture. Applications may be made to the principal of the school.

The Home Economics Self-Government Association Loan Fund

The sum of $250 is available for small emergency loans to women in the Division of Home Economics whose character and scholarship recommend them for assistance. Applications may be made to the dean of women at any time.

PRIZES

The John S. Pillsbury Prize

Three prizes of $100, $50, and $25 respectively, are awarded annually for the best work in the Department of Rhetoric and Public Speaking, as evidenced finally by an oration in public.

The Frank H. Peavey Prize

This prize of $100 is awarded to the members of the team winning the annual freshman-sophomore debate.

The Freshman-Sophomore Oratorical Contest

The sum of $100 is available to furnish prizes for the winners of the first three places in the freshman-sophomore oratorical contest.

The Frank O. Lowden Prize

The annual income from $3,000 is available to orators competing in the Northern Oratorical League. A prize of $100 will be given to the orator winning the first place and $50 to the winner of second place.

The Alumni Weekly Gold Medal

This medal is awarded annually by the faculty committee on debate and oratory to that member of the graduating class who has, in the judgment of the committee, made the best record in forensics during his college course. The medal is awarded only to a student who has shown himself broad-minded, unselfish, industrious, and willing to work courteously and enthusiastically with others so as to serve the highest interests of public speaking in the University.

The '89 Memorial Prize in History

A prize of $50 each year is given for the best thesis in history, written from the sources, by a member of the graduating class.

The Journal Prizes in History

Mr. H. V. Jones of the *Minneapolis Journal* offers each year a first prize of $50 and a second prize of $25 for the two best papers in history written by undergraduates. Literary form will be taken into prominent consideration. Papers must be submitted before May 17.

The William Jennings Bryan Prize

A prize of $50 will be awarded every fourth year to the writer of the best essay upon a topic in Political Science to be announced. The essay, which is limited to ten thousand words, must be handed to one of the instructors in Political Science by May 1. The next award will be made in 1921.

Harris Political Science Prizes

Two prizes of $150 and $100 are given annually by Professor N. D. Harris of Evanston, Illinois, to the writers of the two best essays upon certain specified subjects in the fields of state and local government, foreign politics, or foreign relations. The contest is open to undergraduate men in Indiana, Illinois, Minnesota, Iowa, Michigan, and Wisconsin.

The Menorah Prize

The Intercollegiate Menorah Association, through the generosity of Mr. Arthur M. Harris of Minneapolis, offers an annual prize of $100 for the best paper written on any subject in history, literature, religion, philosophy, or sociology relating to Jews or Judaism, to be approved by a faculty committee. The prize is open to any student in the University.

The Rollin E. Cutts Prize in Surgery

The income from $500 is awarded in the form of a gold medal to that member of the senior class of the Medical School who presents the best thesis showing original work upon a surgical subject.

The Edwin Ames Jaggard Prize in Legal History

A prize of $50 is awarded each year to the student in the Law School whose contributions to the pages of the *Minnesota Law Review* during such year shall be adjudged by the Law Faculty to be most meritorious.

The American Law Book Company Prize

A complete set of the *Cyclopedia of Law and Procedure* is awarded by the Law Faculty to that student in the third-year class who shall have maintained the highest grade of scholarship throughout the three-years' course leading to the degree of Bachelor of Laws.

The Briggs Prize in Foundry Practice

Seventy-five dollars annually, in two prizes, accompanied by gold medals, will be awarded to sophomores in the College of Engineering and Architecture for the best essays relative to foundry practice. No prize will be awarded if less than five essays are submitted in competition. Essays should contain about 3,000 words, and must be submitted to the instructor in rhetoric on or before May 1.

The American Institute of Architects' Medal

This medal is awarded annually by the American Institute of Architects to the senior in each of the leading architectural colleges of the United States who has the highest scholastic standing throughout his course.

The Conference Medal

The Conference Medal is awarded each year by the Intercollegiate Conference Athletic Association to the man, graduating in the senior class of each conference university, who, through a course of four scholastic years' residence in the same university, has the highest degree of achievement in his athletic, as well as in his scholastic, work.

ORGANIZATIONS AND PUBLICATIONS

SELF-GOVERNMENT ORGANIZATIONS

The Minnesota Union was organized in the spring of 1908 "to promote the best interests and welfare of the University of Minnesota, and comradeship among its members, and to erect and maintain a suitable club house for such purposes." All man students of the University are active members of the Union and are assessed a membership fee of seventy cents a quarter, payable at the time of registration. The legislature gave the Chemistry Building for the use of the Union and appropriated $17,500 for remodeling.

The dining room, operated on the cafeteria plan, serves three meals a day at practically actual cost. Students are advised to ascertain the Union prices for board before making arrangements elsewhere.

The Minnesota Union maintains for the convenience of its members, a pool- and billiard-room, smoking-rooms, writing- and study-rooms, barber shop, game-rooms, private dining-rooms for student and faculty luncheons, ball-rooms, and the Little Theater.

The Union gives periodical social activities in the nature of an open house. Reservations for rooms are made through the manager or through the Information Bureau.

The Women's Self-Government Association is open to all woman students of the University. Its purpose is to create a sense of unity and fellowship among the women, to promote and maintain the highest standards of University life, and to regulate all matters of student conduct not falling under the jurisdiction of the faculty. The headquarters of the association are in Shevlin Hall. Members of the association will be in readiness during the opening days to meet new students and to serve them in every way possible. The dues are fifty cents a year.

The All-University Council is composed of representatives elected from the senior class of each college or school. Its function is mainly that of a student self-governing body, representing the student body in matters affecting student interest, controlling their activities to a large extent, and endeavoring to unify the spirit and promote the best possible welfare of the University.

College councils.—Several of the colleges of the University have their own councils articulating with the All-University Council and having similar functions.

MISCELLANEOUS ORGANIZATIONS

There are at the University more than two hundred student organizations representing religious, ethical, literary, scientific, dramatic, athletic, social, and other activities. A complete list of these organizations with brief statements concerning each is given in the *Minnesota Blue Book and Students' Social Register*. A copy may be obtained at the registrar's office.

PUBLICATIONS

The Bulletin of the University of Minnesota includes the *Reports* of the President and of the Board of Regents, the *Annual Register,* the *Bulletin of General Information,* the annual announcements of the individual colleges of the University, announcements of special courses of instruction, reports of University officers, etc.

Research Publications of the University of Minnesota contain the results of original investigations by members of the University. They appear in the form of several series of studies, which offer opportunity for the publication of large monographs and of papers of special importance to the people of this state.

Current Problems Series contains papers of general interest in relation to various lines of work.

Minnesota Law Review.—A legal magazine published monthly, December to June inclusive, by the faculty and students of the Law School.

School of Mines Experiment Station Bulletins contain reports of results of investigations conducted by the State Mines Experiment Station.

Bulletins of the Minnesota Geological Survey include reports of work done in Minnesota by the Minnesota Survey in coöperation with the United States Geological Survey; also, preliminary reports published independently by the Minnesota Survey in order to prevent loss by delaying the use of information of economic value. The most recent reports are: *Surface Formations and Agricultural Conditions of Northwestern, of Northeastern, and of Southern Minnesota; Preliminary Report on the Clays and Shales of Minnesota, Geology and Ore Deposits of the Cuyuna Iron Range, and Peat Deposits in Minnesota.*

Minnesota Botanical Studies.—A series of technical papers, appearing at irregular intervals, giving the reports of the Botanical Survey of Minnesota, and the results of botanical investigations by students and members of the staff of the Department of Botany.

Minnesota Plant Studies.—A series of semi-popular booklets, designed primarily for the use of students and of the people of the state who are interested in knowing the plants of their neighborhood.

Lists with prices of preceding publications will be furnished by the University Librarian.

Agricultural Experiment Station Bulletins give the results of experiments carried on at University Farm and at the substations at Duluth, Crookston, Grand Rapids, Morris, and Waseca, as rapidly as such work is completed, or as soon as conclusions of economic value are reached. At least four such bulletins are published annually. The *Annual Report of the Agricultural Experiment Station* summarizes the business and work of the Agricultural Experiment Station and substations each year.

Minnesota Farmers' Library and *Special Bulletins* are series of popular instructive bulletins issued by the Agricultural Extension Division, designed to inform the farmers of the state as to methods tried out at the Experiment Station and substations, or on demonstration farms, and

approved as good practice for Minnesota farmers. *University Farm Press News* is a semimonthly clip-sheet containing brief instructive articles, designed for reprinting by the newspapers of the state.

The Visitor is a news letter issued monthly by the Division of Agricultural Education of the College of Agriculture, Forestry, and Home Economics. It is sent principally to teachers of agriculture, superintendents of schools, and to students of education in the College of Agriculture, Forestry, and Home Economics.

The Minnesota Daily, the University newspaper, is published five times each week during the University year by the Minnesota Daily Association. Its staff is composed entirely of students.

Foolscap is the official magazine of the University, and appears monthly during the college year. It was established in 1894 as the *Minnesota Magazine,* and was consolidated with the *Minnehaha* in May, 1919. *Foolscap* is edited by the students of the University, and strives to represent the best efforts of the student body and faculty in literature, art, and humor.

The Minnesota Farm Review is a weekly operated under the direction of a committee representing the faculty, the alumni, and the students of the Department of Agriculture, and edited by the Division of Publications and Journalism, as a laboratory for students in journalism.

The Gopher, the Junior Annual, is a book published annually by the junior class of the University.

The School of Forestry Annual is a book published annually by the students of the Forestry Division.

The Agrarian is a book published annually by the senior class of the School of Agriculture.

The Minnesota Alumni Weekly is issued each Monday during the University year. It is published in the interests of the alumni and the University.

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NOTE

On account of the delay in publication of the *Annual Register* for 1919-1920, the University Senate at its meeting February 17, 1921, authorized the omission of the usual chapters on *Description of Departments; Scholarships, Loans, and Prizes; Organizations and Publications; Admission; Degrees and Teachers' Certificates;* and *Expenses.* These chapters will be found, printed in full, in the bulletin of general information for 1919-1920.

DEGREES GRANTED IN 1919

TOTAL—754

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

BACHELORS OF ARTS—253

Paul Kenneth Abrahamson
Frances Louise Ackley
Edna Horonia Akre
Doris Jessamine Allen
Rudolph Harry Anderson
Ruth Alfhild Anderson
Ruth Elsie Anderson
Eva Louise Andrews
Stanley Holte Anonsen
Harriet Katherine Apel
Erna Augusta Archambo
Louise Arosin
Elizabeth Ruth Baihly
Winifred Isabel Bailey
Frances Hall Baird
Winifred Barry
Elizabeth Bearnes
Lorna Beers
Margaret Genevieve Beggin
Ruth Evelyn Berg
Margaret Alavoisa Blanchard
Mary Thatcher Blanchard
Roland Blanchard
Alma Gladys Boehme
Agnes Helen Bolin
Ella Marcia Breed
Clara Brees
Jessie Elberta Broadwell
Ada Brown
Bernice Brown
Elizabeth Gates Brown
Frances Leone Buechler
Muriel Pierce Burdick
Genevieve Burrell
Helen Dorcas Burrows
Anna Mary Buss
Grace Margaret Challman
Mabel Virginia Coffee
Edith Cohen
Ellen Nelson Colleran
Florence Margaret Condon
Maurice Harry Cooperman
Dorothy Cousins
Alexander Robertson Cowie*
Mildred Jane Crawford
Florence Dale
Helen DeLancy Dale
Dorothy Darling
Benedict Spinoza Deinard*
Lelia Louise Delaplane
Palma Elizabeth Deringer
Lucy Elizabeth Dillon
Mae Donaldson
Isabel Downing
Annabel Drenckhahn
Margaret Drum
Paul Henry Dunnavan*
Fred Emmanuel Eastburg
Doris Edwards
Irma Lucile Egan
Lurain Eichten
Edith Empey
Floyd Emery
Agnes Erickson
Ethel Erickson
Edwin Gotfred Erlandson, LL.B.
Borghild Harriet Erling
Helen Irene Evans
Meredith Evans
Ruth Adelaide Evenson
Esther Farnham
Naomi Field
Ruth Severence Field
Bertha Fineman
Harold David Finkelstein
Kathleen Frazee
Gertrude Virginia Freeman
Jane Emily French
Gudrun Gabrielson
Alice Louise Gall
Thomas Francis Gallagher
Grace Caroline Garland
Alice Glenesk
Easer Isidor Goldberg
Ellen Marguerite Goodrich
Evelyn Katherine Graber
Charles Livingston Grandin, Jr.
Robert Gladding Green
Grace Lillian Gunlaugson
Anita Louise Hampe
John Buford Hanley
Carrie Hansen
Conrad Johan Hansen
Hazel Andren Hansen
Gilbert Erskine Harris*
Marion Elizabeth Harris
Mildred Hartsough
Katherine Hartzell
Ludwig John Hauser*
George Allen Heald

* Credit granted for war service.

Agnes Victoria Hedberg
Bessie Heimark
Esther Helgeson
Esther Hemke
Esther Hendrickson
Anita Alice Herbert
John Edgar Hoff
Lillian Hoff
Newton Edwin Holland
Gladys Marion Holt
Murlen Frances Holton
Elsa Ottilia Horn
Caroline Kathryn Horsch
Cora Emily Houghton
Maurine Hovey
Lois Neda Huney
Mary Anderson Hunter
Margaret Hurley
Dorothy Irish
Paul Jaroscak
Esther Nancy Jensen
Margaret Adelaide Johns
Cecil William Johnson
Florence Elizabeth Johnson
Margaret Louise Johnson
Edith Harriet Jones
Sara Jane Kaufman
Agnes Mary Keefe
Margaret Elizabeth Kendall
Annas Kenkel
Lydia Kleffman
Erna Regina Knocke
Roy Fred Korfhage
Erma May Krank
Lucile Marie Kranz
Frank Krey
Elsa Elizabeth Kruse
Elizabeth Lagaard
Mónica Langtry
Arthur Gordon Liddicoat
Carl John Lind
Marie Rosette Lobdell
Doris Downing Lohff
Madeline Stephenson Long
Marie Louise Low
Irwin Ludolph
Elizabeth Lynskey
Grace Lorraine McClure
Mary Laurentine McShane
Frances Marion MacKechnie
Anne Lennox MacPhail
Winifred Helen Mackay
Clarence Retz Marshall
Norine Martin
Marie Dorothea Martinez
Caroline Marie Maurek
Laura Harte Menk
Dorothy Shreve Merrill
Prudence Merriman
Gabriel Peter Meurer
Yun Tai Miao
Gladys Genevieve Miller
Ella Martha Moeller
Ada Corinne Moreland
Teresa Aurelia Morrison
Frances Julia Moynahan
Katherine Murphy
Genevieve Elaine Myers
Marie Naughton
Howard Edward Nelson*
Nina Viola Nelson
Ruth Nelson
Dixie Nickell
Paul Emmeritz Norman*
Kathleen Frances O'Brien
Minnie Marie O'Neill
Charles Elmer Olson
Esther Evangeline Olson
Roger Oscarson
Sarah Paper
Irene Patrick
Adolph Paulson
Rose Mary Pecor
Bertha Florence Peik
Luella Genevieve Pesek
Elsie Peters
Alice Maria Peterson
Mildred Irene Peterson
Ralph Arthur Peterson
Alverta Mae Phillips
Marion Frances Pickard
Gladys Eugenia Poehler
Clara Ravitch
Elsie Willimina Reetz
Annette Marie Reynaud
Nona Caryl Reynaud
Eleanor Robinson
Agnes Katherine Rooney
Coord Frederick Roosen*
Jeanne Rounds
Hertha Henriette Rumsch
Clara Bell Russell
Dorothy Marguerite Ryan
Gladys Mary Ryan
Florence Myrtle Sanders
Ruby Sanderson
Margaret Ruth Scally
Earl Oriol Gregor Schmitt
Helen Schmitt
Margaret Elizabeth Schmitt
Beatrice Schow
Emily Schulte
Ottilie Schurr
Dorothy Elizabeth Sharp
Blanche Catherine Smith
Eunice Marcia Smith
Marion Sogard
Edna Lois Sontag

* Credit granted for war service.

Rosalia Sook
Ebba Juliana Trandberg Sorensen
Meta Marie Sorenson
Raymond Jacob Spurzem
Gretchen Steinhauser
Helen Stock
Russell Losey Strang*
Dorothy Bassett Strong
Mildred Stuble
Marie Inez Sundheim
Helen Tawney
Mildred Hillevi Thelin
Agnes Mary Tomczak
Helen Toomey
Mary Agnes Tracy
Helen Hill Turner
Eva Eunice Vallentyne
Anna Marie van der Hagen
Marie van der Hagen
Esther Vig
Yuanita Dorothy von Bohland
Owen Harding Wangensteen
Ruth Rebecca Warren
Marian Helen Wash
Marsha Elizabeth Watson
Grace Evelyn Wheeler
Lydia Salome Wik
Lorna Jane Wilson
William Hart Wilson*
Claire Margaret Winzenburg
Katherine Wise
Alma Bertha Wolean
Adelaide Woolsey
Helen Elizabeth Zanger
Lucile Edith Ziegelmaier

BACHELORS OF ARTS—*In Music*—18

Signe Adolfson
Isabel Avery
Dorothy Chapman
Edith Cotton
Helen Covart
Viola Gangestad
Maybelle Greenberg
Agnes Hanson
Dorothy Meder
Nellie Robbins
Gladys Rosenberg
Ruth Ross
Cora Sather
Gertrude Schaller
Jeannette Smith
Ragni Sondergaard
Angelene Webber
Leona Will

BACHELORS OF SCIENCE—61

Lucius Franklin Badger, B.A.
Hjalmar Melanchton Berge
Alfred Nicholas Bessesen, Jr.
Daniel Holland Bessesen
Joseph Frederick Bicek
Henry Harold Blaustone
Oscar Blosmo, M.S. in Phm.
Paul Gerhard Boman, B.A.
Harold Samuel Boquist, B.A.
Earl Jeffrey Thorne Bratrude
Alexander Edward Brown
Clarence William Brunkow, B.A.
William Cantwell
Asa Glenn Churchill
Ralph Critchfield
Earl Roy Crow
Verne Chase Crowl
Raymond Joseph Dittrich
Lawrence Doyle
Raymond Martin Eppard
Albert Cole Feaman
Walter Henry Fink
Allen Richard Foss
Verne Smith Gearey
Adolph Edward Gourdeau
Nels Andrew Gunderson
Emil Daniel Hauser
Louis Arthur Hauser, B.A.
Victor Paul Hauser, B.A.
Frank Hirshfield
Robert Joseph Hodapp
Joel Carl Hultkrans
Charles Dean Humberd
David Hjalmar Johnson, B.S., M.S.
Frances Willard King
George Marius Landrock, B.A.
Leroy James Larson
John Leonard Lee
Samuel Litman
Arthur Mauritz Lundholm
Ewing Cleveland McBeath, D.D.S.
Benjamin Martin
Charles Earl Merkert
George Alfred Miners, B.A.
Ray William Monaghan
Stanley Clifford Mulholland, B.A.
Theodore Muller
Louis Julius Pankow

* Credit granted for war service.

Erling Platou
Edward Alexis Regnier
Richard Samuel Rogers
Severin Rudie
Carl Walter Rumpf
Bernard Henry Simons
David Maurice Siperstein
Clifford Edwin Sisler
Harold Conrad Stratte
Horatio Bartholomew Sweetser, Jr.
James Bradford Vail
Gregory Joseph Van Beeck
Ralph Wallace Warnock, B.S.

THE COLLEGE OF ENGINEERING AND ARCHITECTURE

MECHANICAL ENGINEERS—3

Edward Ignatius Anderson, B.S. in Eng.* George Henry Bierman, B.S. in Eng.*
Charles Boehnlein, B.S. in Eng.*

BACHELORS OF SCIENCE—*In Engineering*—44

Arthur Baker
Hiram Kenneth Briggs
Raymond Joseph Bros
Edgar William Christensen
Edward Harold Coe
Richard Alexander Cosh
Ernest Harold Cotton
Archie Joseph Dowd
John Freeman Drinkall
George Robertson Duncan
Harry Cass Elliott
Rudolph Tilden Elstad
Ross Milton Foltz
Harry James Gee
David Grimes
Walter King Hartman
Edward Maxwell Hartzberg
Henry Irwin Hawlik
Robert Heinemann
Frank William Jordan
Harvey Ernest Kapphahn
Frederick Klass
Herbert Andrew Kroeze
Harold Severin Langland
Oscar Clarence Lee
Carroll Eugene Lewis
Eugene Lilly*
Donald Eddy Marshall
George Nickol Moffat
Albertus Montgomery
Gustaf Adolph Nelson
Richard Hall Olson
William Joseph Pavek
Albert Edward Peterson
Arthur Perry Peterson
Alfred Carl Petrich
Joe Willard Pierson
Charles Hubert Reeve*
Oscar Leonard Rosenthal
Theodore Sander, Jr.
Harry Marx Sushansky
Edwin Walter Swanson
Arthur Howard Williams
Milton Sidney Wunderlich

BACHELORS OF SCIENCE—*In Architecture*—9

Edgar Walter Buenger
George Brookes Deane
David Joseph Deneen
George Chase Emery
George Fraser
Jefferson Merritt Hamilton
Ralph Warner Hammett
John Saul Schwartz
Stewart Vern Wright

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

BACHELORS OF SCIENCE—*Course in Agriculture*—23

Don Sherman Anderson
Frank Harshman Brown
Everett Allen Coe
Leslie Colby
Lloyd Coleman
Harold Glenn Davis*
Fordyce Ely
Paul Augustine Flinn
Edwin Albert Hanson
George Herbert Hardisty*

* Credit granted for war service.

Harry Howard Hill*
Milton Earle Hilliard
Louis Sylvester Kelehan
Marcellus William Knoblauch*
Ephraim John Koeneman
Andrew Anthony Kozitza
Guy Thomas Preston*
Benjamin Ives Scott*
Frederic Ackley Tripp
Warren Cleland Waite*
Millard Clarence Westgate*
Laurence Winters
Clinton Graham Worsham

BACHELOR OF SCIENCE—*Course in Forestry*—1

Romayne Lyon Backus

BACHELORS OF SCIENCE—*Course in Home Economics*—45

Edna Phyllis Amidon
Jennie Marie Anderson
Mabel Alphilde Anderson
Lucy Roberta Ashenden
Johanna Baumberger
Elna Violet Boss
Mabel Otelia Brunstad
Miriam Genevieve Close
Clara Mae Dunlop
Frances Dunning
Dora Edwards
Marion Upham Eustis
Berniece Fullerton
Christina Gaumitz
Ruth Juliette Gilbertson
Helen Goetzenberger
Sadie Liella Grimm
Dikka Hillestad
Ethel Sabena Kadlec
Helen Alma Lathrop
Hazel Jorgine Lauritzen
Lily Anne Lenhart
Theresa Ann Lucius
Marion Scott McCall
Agnes McCarthy
Laura Alice McKay
Sarah Dorothy Munson
Dorothy May Newton
Margaret Mary Alice Jane Nolan
Martha Miriam Norseen
Myrtle Dorinda Paulson
Lillian Poppitz
Blanche Sersen
Fern Marie Sewell
Elizabeth Spriestersbach
Esther Stene
Lillian Beatrice Stenseth
Marian Margaret Stewart
Anna Rebecca Thompson
Laura Amelia Timme
Harriet Elizabeth Todd
Aurel Addie Warner
Amy Mabel Wessel
Flora Dell Williams
Bessie Caroline Willis

THE LAW SCHOOL

BACHELORS OF LAWS—13

Lucas Montrose Bacon
Harry Jacob Bikson
Edward Brunsdale
Gerald Thomas Carroll
Herbert Drews
Howard Oliver Dykman, B.A.
Irving Mitchell Frisch, B.A.
Ivan Oscar Hansen, B.A., M.A.
Gilbert Erskine Harris
Arthur Wilson McMillan, B.A.
Hugh Garfield Parker
Paul Reyerson, B.A.
Metellus Thomson, Jr.

THE MEDICAL SCHOOL

DOCTORS OF MEDICINE—40

Hilding Cornelius Anderson, B.S., M.B.
Walter Stephen Broker, B.S., M.B.
Herbert Henry Charles Buscher, B.S., M.B.
Leroy Adelbert Calkins, B.S., M.B.
Wyman Charles Cole, B.S., M.B.
Solomon Fineman, B.S., M.B.
Ruben Columbus Fjellman, B.S., M.B.
Silas Waldemar Giere, B.S.
Stillman John Hathaway, B.S., M.B.
Arthur David Hawkins, B.S., M.B.

* Credit granted for war service.

Edgar Thomas Herrmann, B.S., M.B.
Hillard Herman Holm, B.S., M.B.
Arnold Larson, B.S., M.B.
Charles Louis Lick, B.S., M.B.
Roy Casper Little, B.S.
Rudolph Charles Otto Logefeil, B.S., M.B.
Theodore Christian Lund, B.S.
George Elmer McGeary, B.S., M.B.
John Charnley McKinley, B.S., M.B.
Frank Beattie Morrissey, B.S., M.B.
John Mulder, B.S., M.B.
Morris Nathanson, B.S., M.B.
Edgar Hughes Norris, B.S., M.A.
Nellie Cecilia Elaine Pederson, B.S., M.B.
John Nelson Perkins, B.S., M.B.
William Thomas Peyton, B.S., M.B.
Frieda Jeannette Radusch, B.A., B.S., M.B.
Christian Larson Roholt, B.S., M.B.,
George Elmer Runnerstrom, B.S., M.B.
Lloyd Howard Rutledge, B.A., M.A., M.B.
Virgil Joseph Schwartz, B.S., M.B.
William Raymond Shannon, B.S., M.S.
Edward Phelan Slater, B.S., M.B.†
Chester Arthur Stewart, B.A., M.A., Ph.D.††
William August Carl Sawatzky, B.A., M.B.
John Adolph Timm, B.S., M.B.
John Henry Wallinga, B.S., M.B.
Samuel Arthur Weisman, Phm.B., B.S., M.B.
Laurits Ylvisaker, B.A., M.B.
Arthur Zierold, D.D.S., B.S., M.B.

BACHELORS OF MEDICINE—68

Henry Adolph Barner
Frederick William Behmler, B.S.
Martin Bergheim, B.A., B.S.
Alloys Franklin Branton, B.S.
Earl Jeffrey Thorne Bratrude
James Bain Carey, B.S.
William Greene Crandall, B.S.
Rudolf Lennard Crook, B.S.
Donald Herbert Daniel, B.S.
Irl Davis, B.S.
Wendell Downing, B.A.
Frederick Henry Carl Dubbe, B.S.
Claude Joseph Ehrenberg, B.S.
Swan Ericson, B.S.
Herman Albert Fasbender, B.S.
Albert Cole Feaman
Henry Sumner French, B.S.
John Henry Gammell, M.E., B.S.
Silas Waldemar Giere, B.S.‡
Aloys Thomas Haas, B.S.
John Gerhardi Halland, B.S.
Manley Hewitt Haynes, B.S.
Frank Gustav Hedenstrom, B.S.
Julius Heimark, B.A.
Siegfried Frederick Herrmann, B.S.††
Robert Joseph Hodapp
Charles Hymes, B.S.
Arthur Charles Johnson, B.S.
Hugh Toland Jones, B.A., B.S.
Benjamin Karpman, B.A., M.A.††
Robert Helm Kennicott, B.A.
Thomas James Kinsella, B.S.††
Alfred Ernest Lange, B.S.
Clarence Myhren Larson, B.S.
Algot Siegfried Lineer, B.S.
Hymen Shalit Lippman, B.S.
Samuel Litman
Roy Casper Little, B.S.‡
Oscar Locken, B.A., B.S.
Theodore Lund, B.S.‡
Roger Mattson, B.S.
Harry Arthur Miller, B.A., B.S.
Harold Edward Morrison, B.S.
Russell Wright Morse, B.S.
Leo Thomas Murphy, B.S.
Orville Norman Nelson, B.S.
Anton Harry Nerad, B.S.
Edgar Hughes Norris, B.S., M.A.
Martin Daniel Ott, B.A.
Harold Edward Richardson, B.S.
Leo George Rigler, B.S.
George Elmer Runnerstrom‡
Roy Elmer St. Clair, B.A., B.S.
Leo Morton Schulman, B.S.
John Joseph Seibel, B.A.
William Raymond Shannon, B.S., M.S.
Abraham Shedlov, B.S.
Faus Peter Silvernale, Ph.B.
Adam Moffat Smith, B.S.
Arthur Francis Smith, B.S.
Joseph Michael Sprafka, B.S.
Chester Arthur Stewart, B.A., M.A., Ph.D.††
Rolla Ira Stewart, B.A.
Oscar Highland Ternstrom, B.S.
Leon Julius Tiber, B.S.
Oscar Lloyd Veach, B.S.
Oswald Silvanus Wyatt, B.S.
Thomas Otto Young, B.S.

† Died October 5, 1918. Degree of Doctor of Medicine granted *post obitum*.

†† Honorable mention is made of this candidate for his thesis involving original investigation.

‡ Degree granted as of June, 1918.

GRADUATES IN NURSING—20

Frances Andriette Anderson
Ragnhild Bertine Bjeldanes
Martha Ellen Bowser
Milre Joan Burmeister
Ione Elizabeth Corliss
Hazel Pearl Fryckman
Olga Hanson
Alma Cecelia Haupt, B.A.
Hortense Hilbert, B.A.
Dorothy Kurtzman
Alice Marie Lough
Nora Lund
Pearl Lillian McIver
Edna Mabel Magnus
Inalane Maureen Maguire
Luella Henrietta Olson
Martha Elise Saeter
Jennie Olive Schey
Helen Patricia Smitka
Florence Lavin Warner

THE COLLEGE OF DENTISTRY

DOCTORS OF DENTAL SURGERY—58‡

Albert Frank Anderson
Harry Anderson
Lloyd Anderson
Arthur Verne Aronson
Claude William Bierman
Henry Rudolph Brandt
Kenneth Earl Britzius
Fiske Irving Brooks
Earl Russel Carpenter
James Harold Conway
Maynard Edwin Cook
Leo Albert Daum
Fred Vernon Davidson
Walter Olof Dille
Newton Julian Dobson
Harry Ingman Egdahl
Virgil Elliott
James Milton Foster
Benjamin Fuller
Jalmer Gletne
Otto Ferdinand Hallum
Ralph Kimberley Hawley
Robert Lester Hedburg
August William Johnson
Roman Peter Kline
Louis Charles Krause
Frans Albin Larson
Mandel Metzger Levy
John Kenneth Lynde
Elmer Charles McGill
Samuel George Mara
William Louis Medalie
John George Meisser
Elmer Joseph Mohn
Sylvester Lawrence Murphy
Ralph Shilson Payne
Jens Philip Pederson
David Pink
Reginald Ray Reed
Oscar Rose
Herman David Rostad
Willard Louis Sahr
Ralph Theodore Searing
Michael Aloysius Sivinski
Fred Leonard Skocdopole
Orrin Stafford
Roger Burnett Swenson
Frederick Carl Thiers
Albert LeRoy Thomas
Robert Faville Thurston
Reuben Arthur Ulvestad
Ingvald Veblen
George Conrad Weiser
Harry Casper Wild
Ward Trebor Williams
Henry Douglas Wolff
Benjamin Paul Wrbitzky
Arthur Wrucke

THE SCHOOL OF MINES

ENGINEERS OF MINES—4

Sidney Augustus Frellsen
Bert Goldberg
Samuel Bernhard Goldberg
Walter Ralph Mellem

‡ The class this year is the first in America to be graduated from a four-year course.

ENGINEER OF MINES—*In Geology*—1

Joseph Orrin Hosted

METALLURGICAL ENGINEER—1

Wen Ping Pan, B.S. in Chem.

THE COLLEGE OF PHARMACY

BACHELOR OF SCIENCE—*In Pharmacy*—1

Margaret O'Connell

PHARMACEUTICAL CHEMISTS—9

Harley Ernest Anderson
Ramlal Balaram Bajpai
Howard Sidney Gross
Rose Louise Holec
James Bruce Mayo
Edna Viola Lueda Newhouse
Ethel Rasmussen
Clifford Florain Taplin
Henry Wasielewski

GRADUATE IN PHARMACY

Joseph Benjamin Sugarman

THE SCHOOL OF CHEMISTRY

CHEMICAL ENGINEERS—3

Thorfin Rusten Hogness, B.S.
Harold Kimball Hawkey
Herbert Kessel, B.S. in Chem.

BACHELORS OF SCIENCE—6

Earl Britzius Fischer
Charles Eastman Greenlaw
Harold Kimball Hawkey
Arthur Koch
Albrecht Herman Reu
Raymond Winslow

BACHELORS OF SCIENCE—*In Chemistry*—5

Arthur Charles Beckel
Leslie Carson Brooks
Leslie Gust Engstrom
Frank Joseph Heck
Stuart John Thorson

THE COLLEGE OF EDUCATION

BACHELORS OF ARTS—*In Education*—38

Gertrude Blanch Austin
Charles Bond
Myrtle Pauline Bowser
Henriette Louise Brudos
Elizabeth Ward Burbank
Marian Gertrude Drake
Roy Homer Good
Mary Guinn
Esther Hain
Bertha Hinshaw
Harold Francis Janecky
Eddis Emery Janes
Amanda Hedvig Johnson
Roland Joseph*
Helen Kingstedt
Clara Krefting
Mary Pearl Lean
Gladys Lee
Hazel Eugenie Linstrom
Paul Edward Lutz
Helen Frances Maguire
Calista Mary Miles
Afra Myron
Bernadetta Marie Paton
Edwin Maurice Pfutzenreuter
Gladys Poole

* Credit granted for war service.

Evelyn Mildred Purdy
Leone Reidenger
Joseph Edward Reinke
Lewis Rist†
Jacob Schultz
Lynn Fred Slocum
Alice Mary Smith
Louise Smith
Selmer Edvin Syvertson
Alice Howell Underwood
Glenn Farrand Varner
Wilhelm Arthur Ziegler

THE GRADUATE SCHOOL

MASTERS OF ARTS—31

Grace Mary Arthur
B.A. '17, Hamline
Major, Psychology
Minor, Education
Thesis, An Absolute Intelligence Scale, a Study in Method

Martin Henry Bertram
Concordia College
Major, German
Minor, Education
Thesis, Goethes ideale Frauengestalt

Jean Catel
B.A. '09, B.S. '11, LL. '13, Lille
Major, English
Minor, Romance (French)
Thesis, Distinctive Images in Some Modern American Poets

Wilma Emily Eustis
B.A. '18, Minnesota
Major, History
Minor, Political Science
Thesis, The Policies of France and Prussia, 1865-1870

Hugh Graham
B.A. '07, Ireland
Major, Education
Minor, English
Thesis, Early Irish Monastic Schools

John Walter Gruner
B.A. '17, New Mexico
Major, Geology
Minor, Chemistry
Thesis, Geologic Reconnaissance of the Southern Part of the Taos Range, New Mexico

Julia Frances Herrick
B.A., '15, Minnesota
Major, Physics
Minor, Mathematics
Thesis, A Method of Ascertaining the Direction of Penetrating Radiation

† Degree granted as of June, 1918.

Siegfried Frederick Herrmann
B.S. '15, Hamline
Major, Bacteriology
Minor, Pathology
Thesis, The Effect of Foreign Protein on Antibody Production

Judith Alymer Jacobs
B.A. '17, Minnesota
Major, Educational Psychology
Minor, Education
Thesis, Relation of Achievements in Army Tests to Achievements in University Subjects

John William Johnson
B.A. '98, Carleton
Major, Education
Minor, Scandinavian
Thesis, The Junior High School, with Special Reference to Its Minimum Essentials

Carl Edward Julihn
B.E. '04, Columbia
Major, Metallography
Minor, Geology
Thesis, The Occurrence and Dissociation of Martensite and Austenite in Hypereutectoid Steel

Jean Frances MacInnes
B.S. '16, Illinois
Major, Plant Pathology
Minor, Botany
Thesis, Wheat Scab

Helen Adams Mackeen
B.S. '18, Minnesota
Major, Anatomy
Minor, Pathology
Thesis, The Growth of the Abdominal Regions in the Human Fetus

Valborg Taylor Olson
B.A. '18, Minnesota
Major, Romance (French)
Minor, Romance (Spanish)
Thesis, Voltaire's *Oedipe* and Racine

Albert Erik Pearson
B.A. '13, LL.B. '16, Minnesota
Major, Education
Minor, Scandinavian
Thesis, Rights and Duties of Public School Teachers

Gladys Poole
B.A. '19, Minnesota
Major, Education
Minor, Educational Psychology
Thesis, The Relation between Ability, the Salaries Paid and the Experience of Rural Teachers of Minnesota

Samuel Ralph Powers
B.A. '12, Illinois
Major, Education
Minor, Chemistry
Thesis, The Teaching of Chemistry in Secondary Schools of the United States during the First Half of the Nineteenth Century

Frank Lester Roberts
B.A. '18, Minnesota
Major, Anatomy
Minor, Pathology
Thesis, Changes in the Mammary Gland of the Albino Rat during the Second Half of Pregnancy

Charles Kirkland Roys
B.A. '97, Princeton
M.D. '02, Columbia
Major, Anatomy
Minor, Anthropology
Thesis, Some Growth Changes in the Walls of the Thorax in the Human Fetus

Joseph Aloysius Schabert
B.A. '16, St. Thomas
Major, Psychology
Minor, Philosophy
Thesis, Individual Differences in Emotional Response as Measured by the Psycho-Galvanic Reflex

Sister Henrica Leifeld
B.A. '16, St. Catherine
Major, German
Minor, Middle High German
Thesis, Dramatic Elements in the "Novellen" of Theodor Storm

Sister Jeanne Marie Bonnett
B.A. '17, St. Catherine
Major, Educational Psychology
Minor, German
Thesis, Standard Vocabulary Tests for Mental and Educational Diagnosis

Dora Valentine Smith
B.A. '16, Minnesota
Major, English
Minor, History
Thesis, The Use of Accident in the Novels of Thomas Hardy

Harry Benjamin Smith
B.S. '97, Minnesota
Major, Education
Minor, Agricultural Education
Thesis, Organization and Presentation of an Agricultural Curriculum for a Rural Consolidated School

Teresa Mary Sweetser
B.A. '17, Trinity
Major, Sociology, Social and Civic Work
Minor, Psychology
Thesis, A Survey of the Social Service Done by Catholic Agencies in the Twin Cities

Faith Thompson
B.A. '17, Minnesota
Major, History
Minor, Political Science
Thesis, The First Half-Century of Magna Carta: Why It Persisted as a Document

Lucie Tomlinson
B.A. '18, Minnesota
Major, Romance (French)
Minor, Romance (Spanish)
Thesis, Voltaire's *Zaïre* and the Tragedies of Racine

Ruth Elinor Underwood
B.A. in Educ. '18, Minnesota
Major, Romance (French)
Minor, Romance (Spanish)
Thesis, Voltaire's *Oreste* and Racine

Ruth Margaret Van Camp
B.A. '18, Hamline
Major, Psychology
Minor, Education
Thesis, The Roman House: Its Origin and Development

Ruth Van Tuyl
B.A. '15, Minnesota
B.A. '16, Mount Holyoke
Major, Latin
Minor, History
Thesis, The Roman House: Its Origin and Development

Edna Mary Wolf
Ph.B. '11, Hamline
Major, Psychology
Minor, Chemistry
Thesis, Quantitative Studies of the Relation of Oxygen Concentration to Oxygen Consumption in the Leech Erpobdella Punctata

MASTERS OF SCIENCE—3

Frederik Waldemar Hvoslef
B.S. '17, Minnesota
Major, Mechanical Engineering
Minor, Mathematics
Thesis, A Study of the Transmission of Heat through Glass

Walter Joachim Koppen
B.S. '15, Washington State College
Major, Horticulture
Minor, Farm Management
Thesis, The Cost of Apple Production in Thirty-five Representative Orchards in Minnesota

Carl Kurtzweil
B.S. '17, Iowa State College
Major, Agronomy
Minor, Cytology
Thesis, Differentiating Characters and Their Inheritance in Marquis, Preston, and Bluestem Spring Wheat

MASTER OF SCIENCE—*In Neurology*—1

Charles Edward Nixon
B.A. '08, Pacific Union College
M.D. '15, University of Southern California
Major, Neurology
Minor, Pathology
Thesis, The Pathogenesis of the Lesions of the Nervous System Found in Cases of Pernicious Anemia

MASTER OF SCIENCE—*In Experimental Surgery*—1

Carleton Dederer
B.A. '04, Cornell
M.D. '07, Columbia
Major, Surgery
Minor, Pathology
Thesis, Transplantation of the Kidney and Ovary

MASTERS OF SCIENCE—*In Surgery*—6

Edmund Joseph Horgan
M.D. '08, George Washington
Major, Surgery
Minor, Pathology
Thesis, The Histogenesis of Carcinoma in the Islets of the Pancreas

Ivan Wodrow McDowell
M.D. '08, Medical College of Virginia
Major, Surgery
Minor, Pathology
Thesis, Cancer of the Stomach

William Oscar Ott
B.S. '10, Louisiana
M.D. '14, Chicago (Rush)
Major, Surgery
Minor, Pathology
Thesis, Surgical Aneurysms

Thaddeus Benjamin Reeves
B.S. '09, Clemson College
M.D. '14, Virginia
Major, Surgery
Minor, Pathology
Thesis, A Study of the Arteries Supplying the Stomach and Duodenum and Their Relation to Ulcer

William Joseph Tucker
B. A. '10, M.A. '12, M.D. '14, St. Louis
Major, Surgery
Minor, Pathology
Thesis, Infections of the Kidney

Edward Howland Weld
B.A. '05, M.D. '07, Michigan
Major, Surgery
Minor, Roentgenology
Thesis, Renal Absorption with Particular Reference to Pyelographic Mediums

MASTER OF SCIENCE—*In Pediatrics*—1

Albert Guy Alley†
M.D. '05, Minnesota
Major, Pediatrics
Minor, Chemistry

DOCTORS OF PHILOSOPHY—14

George Delwin Allen
B.A. '07, Oberlin
M.S. '10, Chicago
Major, Animal Biology
Minor, Physiology
Thesis, Quantitative Studies on the Rate of Respiratory Metabolism in Planaria

Clarence Carleton Bausman
B.A. '16, M.S. '17, Minnesota
Major, Botany
Minor, Plant Pathology
Thesis, Studies on the Morphology of Some Australian Algae

Lois Clark
B.A. '07, M.A. '10, Washington
Major, Botany
Minor, Micology
Thesis, The Embryology of Podolphyllum

Katherine Melvina Downey
B.A. '10, M.A. '13, Minnesota
Major, Physics
Minor, Mathematics
Thesis, The Variation of the Residual Ionization of the Air with Pressure

George Elmer Holm
B.S. '14, Carleton
M.S. '15, Minnesota
Major, Biochemistry
Minor, Organic Chemistry
Thesis, The Hydrolysis of Proteins in the Presence of Aldehydes

John Ludwig August Huchthausen
R.M. '92, Concordia
M.A. '16, Minnesota
Major, German
Minor, Comparative Philology
Thesis, Ideas of Freethinking Protestant Pastors in Modern German Novels

Arthur Monrad Johnson
B.A. '04, Minnesota
Major, Botany
Minor, Entomology
Thesis, A Revision of the Section Boraphila Eugler of the Genus Saxifraga

Willis Ernest Johnson
B.A. '18, M.A. '18, Minnesota
Major, Education
Minor, Sociology
Thesis, The Formation of Standards of Educational Achievement for a State

† Died October 23, 1918. Degrees of Master of Science in Pediatrics conferred *post obitum.*

Rivera Harding Jordan
B.A. '93, M.A. '13, Yale
Major, Education
Minor, Educational Psychology
Thesis, The Relationship between Nationality and School Progress

Frances Erma Lowell
B.A. '15, M.A. '17, Minnesota
Major, Psychology
Minor, Education
Thesis, A Group Intelligence Scale for Primary Grades

Vinnie Arah Pease
B.S. '07, Puget Sound
M.S. '16, Washington
Major, Botany
Minor, Organic and Phytochemistry
Thesis, The Taxonomy and Morphology of the Ligulate Species of the Genus Desmarestia

Adolph Ringoen
B.A. '09, M.A. '13, Iowa
Major, Animal Biology
Minor, Anatomy
Thesis, The Origin of the Eosinophil Leucocytes of Mammals

Irene Sandiford
B.A. '13, Radcliffe
Major, Medicine
Minor, Physiology
Thesis, Clinical Metabolism

Wilson Porter Shortridge
B.A. '07, Indiana
M.A. '11, Wisconsin
Major, History
Minor, Economics
Thesis, The Life of Henry Hastings Sibley

DOCTOR OF PHILOSOPHY—*In Surgery*—1

John Louis Butsch
B.S. '06, M.D. '11, M.S. '15, Johns Hopkins
Major, Surgery
Minor, Medicine
Thesis, Ulcers of the Gastro-Intestinal Tract with Special Reference to Gastro-Jejunal Ulcers

DOCTOR OF PHILOSOPHY—*In Obstetrics and Gynecology*—1

Lee Willis Barry
M.D. '11, Michigan
Major, Obstetrics and Gynecology
Minor, Anatomy
Thesis, The Effects of Inanition in the Pregnant Albino Rat with Special Reference to the Changes in the Relative Weights of the Various Parts, Systems, and Organs of the Offspring

HONORS AND PRIZES

HONORS

CONFERENCE MEDAL

Erling Platou, Md. '21

THE AMERICAN INSTITUTE OF ARCHITECTS MEDAL

Edgar Buenger

HONOR GRADUATES OF THE MILITARY DEPARTMENT TO BE REPORTED TO THE ADJUTANT GENERAL OF THE UNITED STATES ARMY AND THE ADJUTANT GENERAL OF THE MINNESOTA NATIONAL GUARD

Edward Harold Coe, E. '19
Benjamin Allen Gingold, Md. '23
Theodore Sander, Jr., E. '19
Russell Losey Strang, A. '19

DEGREES WITH HONORS

In English

Annette Reynaud

In Geology

Frank Krey

In German

Esther Hendrickson
Esther Strand

In History

Agnes Erickson
Mildred Hartsough
Elizabeth Lynskey

In Norwegian

Clara Krefting

In Rhetoric

Madeline Stephenson Long

THE MINNEAPOLIS COLLEGE WOMAN'S CLUB SCHOLARSHIP

Frances Ford, B.S., Md. '21

THE ST. PAUL COLLEGE WOMAN'S CLUB SCHOLARSHIPS

Edith Lois Brocker, A. '22
Leila Elizabeth Munson, A. '20
Lois Collinson Roberts, A. '22
Charlotte Larkin, A. '23

THE MINNEAPOLIS WOMEN'S CLUB SCHOLARSHIP

Sophie Holzheid, A. '21

THE WOMEN'S SELF-GOVERNMENT ASSOCIATION SCHOLARSHIP

Elizabeth Malerich, P. '20

THE MOSES MARSTON SCHOLARSHIP IN ENGLISH

Alexander Robertson Cowie

THE ALBERT HOWARD SCHOLARSHIP

James Christian Lindberg, M.A. '05, Nebraska

CLASS OF 1890 FELLOWSHIP

Edith Harriet Jones

THE SHEVLIN FELLOWSHIPS

Science, Literature, and the Arts

Theodore Christian Blegen, B.A. '12, M.A. '15

Agriculture

Marshall Hertig, B.S. '16

Medicine

Hawthorn Collins Wallace, B.A. '14, Muskingum, M.D. '19, Rush Medical

Chemistry

Elden Bennett Hartshorn, B.S. '12, Dartmouth

THE GEORGE H. PARTRIDGE SCHOLARSHIPS

Winifred Bailey, A. '19
Marie Bauduin, C.U.
Jaqueline Bertillon, S.L. '21
Minnie Carlson, A. '21
Cora Emily Houghton, A. '19
Margaret Johnson, A. '19
Eunice Tollifson, A. '21

THE NINA MORAIS COHEN SCHOLARSHIP

Bessie Kasherman, A. '21

THE FACULTY WOMEN'S CLUB SCHOLARSHIP

Vere Kinney, A. '20

THE GET TOGETHER CLUB SCHOLARSHIP

Minerva Kellogg, Ag. '20

MINNESOTA STATE PHARMACEUTICAL ASSOCIATION SCHOLARSHIP

Elizabeth Malerich, P. '20

THE CIVIC AND COMMERCE ASSOCIATION SCHOLARSHIP

Addison Henry Douglass, B.S. in Eng.

THE NORTHERN INSULATING COMPANY SCHOLARSHIP

Milton Sidney Wunderlich, B.S. in Eng.

PRIZES

THE BRIGGS PRIZE IN FOUNDRY PRACTICE

First Place

Alexander Walker Luce, E. '21

Second Place

Lloyd Armstrong Elmer, E. '21

THE ROLLIN E. CUTTS PRIZE IN SURGERY

Thomas James Kinsella, Md. '20

THE FRANK H. PEAVEY PRIZE

First Place

Rose Feigelman, A. '21

Second Place

Charles Arthur Irwin, A. '21

Third Place

Milton Kodas, A. '21

THE JOHN S. PILLSBURY PRIZE

First Place

Samuel Maslon, A. '20

Second Place

George Percy Hough, L. '20

Third Place

Glenn Varner

THE JOURNAL PRIZES IN HISTORY

First Place

No award

Second Place

Mabel Grover, A. '20

THE '89 MEMORIAL PRIZE IN HISTORY

Mildred Lucile Hartsough

THE EDWIN AMES JAGGARD PRIZE

Herbert H. Drews

STUDENTS, 1919–20

THE GRADUATE SCHOOL

ENROLMENT—557

Resident Students—411

Adams, Arlon Taylor, St. Paul — Comparative Philology
B.A., Wesleyan, 1903; M.A., Wesleyan, 1

Agnew, Allen Tindolph, Minneapolis — Anatomy
M.D., Minnesota, 1917

Ahlers, Harriet Howe, St. Cloud
B.A., Minnesota, 1915

Albjerg, Victor Lincoln, Fergus Falls — Education
B.A., Minnesota, 1918

Alexander, Jean Hamilton, Findlay, Ohio — Education
B.S., Ohio State, 1915; M.A., Ohio State, 1916

Amunds, Marion, Hudson, Wis. — Americanization Training and Anthropology
B.A., Minnesota, 1920

Anderson, Arthur von Krogh, Minneapolis — Agricultural Biochemistry
B.S. in Agr., Minnesota, 1913; M.S., Minnesota, 1915

Anderson, Edla Victoria, De Kalb, Ill. — Agricultural Biochemistry
B.S., Illinois, 1918

Anderson, Hilding Edward, Madison, Wis. — Agricultural Economics
B.S., Wisconsin, 1917

Anderson, Rudolph Harry, Foley — Economics
B.A., Minnesota, 1919

Anderson, Tena, Farmington — Education
B.A., St. Olaf, 1910

Ankeney, John Velte, St. Paul — Agricultural Education
B.S. in Educ., Miami, 1915

Armstrong, Ellery Leslie, Park Rapids — Ophthalmology and Oto-Laryngology
B.S., Minnesota, 1916; M.D., Minnesota, 1916

Atwood, Olive, Trempealeau, Wis. — Mathematics
B.A., Carleton, 1917

Arny, Albert Cedric, St. Paul — Farm Crops
B.S. in Agr., Minnesota, 1909; M.S., Minnesota, 1917

Arthur, Mary Grace, St. Paul — Psychology
B.A., Hamline, 1917; M.A., Minnesota, 1919

Augustine, Donald Leslie, Kasson — Parasitology
B.S., Macalester, 1918

Babcock, Mrs. Emily Atwater, Minneapolis — Latin
B.A., Minnesota, 1918

in attempting to handle the problem adequately may be understood. Less than one third of the students now in attendance can get into the Armory at one time.

Despite all the other pressing needs of the institution, which your committee fully recognizes, it nevertheless urges most vigorously that steps be taken promptly to insure for the University an auditorium that will seat comfortably at least the major portion of t e student body under conditions of esthetic value and inspiration[illegible] vironment in keeping with the size, dignity, and purpose of the f[illegible] character-building institution of the state.

3. *Relationshi[illegible] nts.*—One of the constant problems of a l[illegible]sity is [illegible] establishment and maintenance of the right [illegible]onship bet[illegible] teachers and students. On February 18, 1920. a group of stu[illegible] upon their own initiative, appeared befor[illegible] the Administrati[illegible]mittee of the senate to present thei[illegible]onvictions upon th[illegible]t. Their point of view was extre[illegible]ly interesting and val[illegible] from their own personal experie[illegible], they recognized and c[illegible] that it was always possible to enjoy the most helpful [illegible]ships with the faculty. Nevertheless, they were disturbed with the prevalence of the feeling among large numbers of students that it was quite impossible to know personally the teachers of the University. The subject was discussed at length by the deans and later a most valuable and illuminating gathering was held at the Minnesota Union. This group consisted of all the members of the Administrative Committee and the Student Council, with the addition of various representative students. It was generally agreed that better relationships between students and faculty were possible and desirable. The most definite and constructive suggestion growing out of these discussions was that here, as at other universities, it would be wise to have an officially recognized council or conference committee, where faculty members and students meet regularly to discuss their common problems and to arrive at a mutual understanding of many subjects which are frequently misunderstood through lack of knowledge.

STATISTICS OF REGISTRATION

Collegiate students.—Table I records the attendance of students of collegiate grade, i.e., those in courses leading to degrees. All students in this group must present for admission evidence

of at least the completion of a four-year high-school course. It is this group that must be kept most in mind in comparing the University of Minnesota with other colleges and universities.

The net gain of 1,648 students over the year 1918-19 represents [illegible] of 22 per cent, but it should be remembered that 1918 was the year of the Students' Army Training Corps. During that year 3,252 students were enrolled in the S.A.T.C. Upon demobilization 1,233 of these left college, and therefore, in one sense may be counted as an extraneous group. Omitting the count of that part of the former group that left college November 11 upon the signing of the armistice, we have 6,146 for the total collegiate enrolment of 1918-19, and comparing the 1920 registration with this figure we find a net gain of 46 per cent which more really indicates the actual working conditions. Distinct gains are shown in all departments, except where the enrolment has been artificially limited as in Medicine, Dentistry, and Pharmacy.

This unusual at[illegible]e may be attributed to the following causes:

1. The Unive[illegible]w getting the cumulative effect of what would hav[illegible]ormal increase in the past few years, had not the We[illegible]errupted the natural course of events.

2. An impetu[illegible]as been given to higher education by the war itself. The young men have not been slow to note that those who most readily won preferment were fellows with college training.

3. The educ[illegible]all service men who were residents of Minnesota at the time of enlistment.

TABLE I. COLLEGIATE STUDENTS BY SCHOOLS AND COLLEGES, 1918–1920

College or School	Year 1918-19			Year 1919-20			Gain	Loss
	Men	Women	Total	Men	Women	Total		
Science, Literature, and the Arts:								
Seniors	48	261	309	81	234	315	6	.....
Juniors	94	233	327	162	191	353	26	.....
Sophomores	211	303	514	555	406	961	447	.....
Freshmen	452	428	880	1238	684	1922	1042	.....
Unclassed	34	84	118	75	120	195	77	.....
Total	839	1309	2148	2111	1635	3746	1598	.....

TABLE I—*Continued*

College or School	Year 1918-19			Year 1919-20			Gain	Loss
	Men	Women	Total	Men	Women	Total		
Engineering and Architecture:								
Post-seniors	3	.....	3	10	.....	10	7	.....
Seniors	55	.....	55	108	.....	108	53	.....
Juniors	86	.....	86	153	3	156	70	.....
Sophomores	151	4	155	264	1	265	110	.....
Freshmen	647	2	*649	646	2	648	.....	1
Unclassed	8	1	9	18	8	26	17	.....
Total	950	7	957	1199	14	1213	256	.....
Agriculture, Forestry, and Home Economics:								
Seniors	24	51	75	64	59	123	48	.....
Juniors	39	68	107	79	67	146	39	.....
Sophomores	40	49	89	77	70	147	58	.....
Freshmen	52	70	122	183	99	282	160	.....
Unclassed	9	13	22	9	17	26	4	.....
Total	164	251	415	412	312	724	309	.....
Law:								
Third-year	21	.....	21	51	2	53	32	.....
Second-year	38	3	41	65	1	66	25	.....
First-year	79	4	83	142	5	147	64	.....
Unclassed	1	1	2	1	.....	1	.....	1
Total	139	8	147	259	8	267	120	.....
Medical:								
Seventh-year	38	2	40	53	.....	†53	13	.....
Sixth-year	61	1	62	87	6	93	31	.....
Fifth-year	60	6	66	54	2	56	.....	10
Fourth-year	72	2	74	76	7	83	9	.....
Third-year	75	8	83	80	4	84	1	.....
Unclassed	12	3	15	2	1	3	.....	12
Special	....	.....	.....	11	2	13	13	.....
Total	318	22	340	363	22	385	45	.....
Nursing	....	126	126	....	156	156	30	.....
Dentistry:								
Seniors	60	.....	60	79	3	82	22	.....
Juniors	74	1	75	90	4	94	19	.....
Sophomores	86	3	89	132	2	134	45	.....
Freshmen	116	2	118	87	2	89	.....	29
Unclassed	5	.....	5	1	.....	1	.....	4
Total	341	6	347	389	11	400	53	.....
Mines:								
Seniors	7	.....	7	16	.....	16	9	.....
Juniors	13	.....	13	20	.....	20	7	.....
Sophomores	17	.....	17	36	.....	36	19	.....
Freshmen	43	.....	43	86	.....	86	43	.....
First-year	26	.....	26	....	.....	.....	.....	26
Unclassed	1	.....	1	....	.....	.....	.....	1
Total	107	.....	107	158	.....	158	51	.....
Pharmacy:								
Fourth-year	2	1	3	....	2	2	.....	1
Third-year	10	3	13	15	12	27	14	.....
Second-year	11	10	21	19	8	27	6	.....
First-year	59	17	76	52	9	61	.....	15
Total	82	31	113	86	31	117	4	.....

TABLE I—*Continued*

College or School	Year 1918-19			Year 1919-20			Gain	Loss
	Men	Women	Total	Men	Women	Total		
Chemistry:								
Post-seniors	3	.....	3	7	.....	7	4	.....
Seniors	11	1	12	19	1	20	8	.....
Juniors	20	.....	20	26	.....	26	6	.....
Sophomores	35	3	38	38	6	44	6	.....
Freshmen	65	7	72	78	.....	78	6	.....
Unclassed	5	1	6	....	1	1	.....	5
Total	139	12	151	168	8	176	25	.....
Education:								
Seniors	13	26	39	16	45	61	22	.....
Juniors	8	36	44	13	140	153	109	.....
Sophomores	....	10	10	....	21	21	11	.....
Freshmen	....	19	19	....	37	37	18	.....
Unclassed	25	149	174	81	143	224	50	.....
Total	46	240	286	110	386	496	210	.....
Business:								
Seniors	....	.....	.....	20	1	21	21	.....
Juniors	....	.....	.....	45	12	57	57	.....
Unclassed	....	.....	.....	9	1	10	10	.....
Total	....	.....	.....	74	14	88	88	.....
Graduate	206	110	316	422	135	557	241	.....
War specials	....	.....	.....	31	.....	31	31	.....
Summer session	453	806	1259	787	809	1596	337	.....
Students' Army Training Corps, collegiate section	3252	.....	‡3252	....	.....	.....	.....	3252
Grand total	7036	2928	9964	6569	3541	10110	146	.....
Less duplicates	2352	233	2585	680	403	§1083	−1502	.....
Net grand total	4684	2695	7379	5889	3138	9027	1648	.....

* Of this number 387 were registered in the Students' Army Training Corps only.

† Of this number 43 are students *in absentia,* completing the internship requirement for the Doctor of Medicine degree.

‡ Students pursuing approved war programs under the direction of the United States War Department during the fall quarter.

§ This total comprises 239 transfers between the various schools and colleges and 844 students registered for the summer session of 1919 who were enrolled during the fall, winter, or spring quarters of 1919-20.

Collegiate enrolment by quarters.—Table II merely records the totals of Table I by quarters, showing the peak load of attendance in the fall quarter. Very few opportunities for beginning students were offered during the second and third quarters.

TABLE II. COLLEGIATE ENROLMENT BY QUARTERS, 1919–1920

	Men	Women	Total
Summer Session, 1919	787	809	1,596
Fall quarter	5,221	2,419	7,640
Winter quarter	4,981	2,228	7,209
Spring quarter	4,368	2,082	6,450
Total (individual) registrations	5,889	3,138	9,027

Subcollegiate students.—Table III records the enrolment in departments which do not require high-school graduation for admission. The loss of 2,287 for this group is explained by the disappearance of the S.A.T.C. which had 2,931 students enrolled in the vocational section during 1918-19. The thresherman's short course and the boy scout short course were offered in 1919-20 for the first time.

No special comment concerning the subcollegiate group appears necessary, except perhaps for the following divisions:

1. Discharged wounded soldiers: These students were registered in a special course during 1918-19, but during 1919-20 were included with the regular students in the School of Agriculture. The number has actually increased to something over 200, altho it appears at a loss of 34 in the tabular statement.

2. Journalism: The short course in journalism no longer appears in the Annual Register figures, since no fee is charged by the University for this course. The short course is held at the same time as the conference of editors.

3. Teachers' training school: The marked losses in registration in the teachers' training school held at the Central School, the Northwest School, and the West Central School are due to the fact that only students who have had one year of previous work at one of these schools were permitted to register during the summer of 1919. The others were sent to one of the normal schools where the work was entirely transferred during the summer of 1920. All of the teachers' training school work in the University has been discontinued.

TABLE III. SUBCOLLEGIATE STUDENTS, 1918–1920

School or course	Year 1918-19			Year 1919-20			Gain	Loss
	Men	Women	Total	Men	Women	Total		
Central School of Agriculture:								
Three-year course:								
Seniors	57	34	91	85	28	113	22	.....
Juniors	100	37	137	134	47	181	44	.....
Freshmen	190	47	237	382	91	473	236	.....
Unclassed	26	2	28	238	.....	238	210	.....
Total	373	120	493	839	166	1005	512	.....
Discharged wounded soldiers	34	.....	34	....	.....	....	.....	34
Intermediate course	....	.....	....	10	3	13	13	.....
Normal course	....	7	7	....	9	9	2	.....
Total	407	127	534	849	178	1027	493	.....
Northwestern School of Agriculture, Crookston:								
School enrolment	147	51	198	229	72	301	103	.....
West Central School of Agriculture, Morris:								
School enrolment	142	85	227	179	79	258	31	.....
University High School	93	118	211	92	133	225	14	.....
Total, schools	789	381	1170	1349	462	1811	641	.....
Short courses:								
Embalming	15	4	19	34	1	35	16	.....
Dairy school	34	2	36	120	.....	120	84	.....
Gymnasium extension classes	84	30	114	102	23	125	11	.....
Consolidated school principals	42	29	71	69	18	87	16	.....
Grain elevator accounting and management	15	.....	15	7	.....	7	.....	8
Journalism	3	3	6	....	.....	....	.....	6
Home nursing	....	110	110	....	85	85	.....	25
Thresherman's short course	....	.....	.....	39	.....	39	39	.....
Forestry short course, Itasca Park	....	.....	.....	12	.....	12	12	.....
Traction engineering	....	.....	.....	21	.....	21	21	.....
Boy scout short course, Itasca Park	....	.....	.....	19	.....	19	19	.....
Teachers' training school:								
Central	2	346	348	5	232	237	.....	111
Crookston	3	103	106	....	.....	....	.....	106
Morris	....	70	70	2	47	49	.....	21
Junior short course:								
Crookston	69	54	123	93	89	182	59	.....
Morris	99	171	270	127	145	272	2	.....
Farm women's short course:								
Morris	....	71	71	....	74	74	3	.....
Total, short courses	366	993	1359	650	714	1364	5	.....
Less duplicates	2	.....	2	1	.....	1	—1	.....
Net total, short courses	364	993	1357	649	714	1363	6	.....
Students' Army Training Corps, vocational sections	2931	.....	2931	....	.....	....	.....	2931
Grand total	4084	1374	5458	1998	1176	3174	.....	2284
Less duplicates	....	2	2	1	4	5	.....	—3
Net grand total	4084	1372	5456	1997	1172	3169	.....	2287

Extension students.—Table IV shows two types of students (a) general, those who pursue courses in classrooms under the personal direction of instructors, and (b) correspondence, those who take study courses through the medium of written directions sent by mail.

The very noticeable gain of 112 per cent in this department is very likely due to the widespread interest in education following the war. Many persons in business and other callings are eagerly seizing the opportunities offered by the Extension Division to increase their capacity for effective work and advancement.

TABLE IV. EXTENSION STUDENTS, 1918–1920

Course	Year 1918-19			Year 1919-20			Gain	Loss
	Men	Women	Total	Men	Women	Total		
General	1130	976	2106	2526	2103	4629	2523	.....
Correspondence	190	210	400	451	301	752	352	.....
Total	1320	1186	2506	2977	2404	5381	2875	.....
Less duplicates	....	.....	.....	16	34	50	50	.....
Net total	1320	1186	2506	2961	2370	5331	2825	.....

Summary.—Table V summarizes Tables I, III, and IV under the headings: collegiate, subcollegiate, and extension students. When it is remembered that of the subcollegiate students of 1918-19, 2,931 were in the vocational section of the S.A.T.C., and under normal conditions would not have attended the University at all, it makes the increase of the past year all the more striking. The figure of 17,326 actually registers the number of

TABLE V. SUMMARY, 1918–1920

Division	Year 1918-19			Year 1919-20			Gain	Loss
	Men	Women	Total	Men	Women	Total		
Collegiate students	4684	2695	7379	5889	3138	9027	1648	.....
Subcollegiate students	4084	1372	5456	1997	1172	3169	.....	2287
Total	8768	4067	12835	7886	4310	12196	.....	639
Less duplicates	13	16	29	12	4	16	.....	13
Net total	8755	4051	12806	7874	4306	12180	.....	626
Extension students	1320	1186	2506	2961	2370	5331	2825	.....
Grand total	10075	5237	15312	10835	6676	17511	2202	.....
Less duplicates	19	50	69	80	105	185	116	.....
Net grand total	10056	5187	15243	10755	6571	17326	2083	.....

men and women who during the past year received instruction at the hands of members of the University teaching staff. It is by far the largest enrolment in the history of the institution.

Table VI is another summary giving the registration by departments. Agriculture in this table includes college, school, and short courses. By resident students is meant those who were in day classes in the University building as differentiated from those who attended evening classes in the Twin Cities or who took work by correspondence.

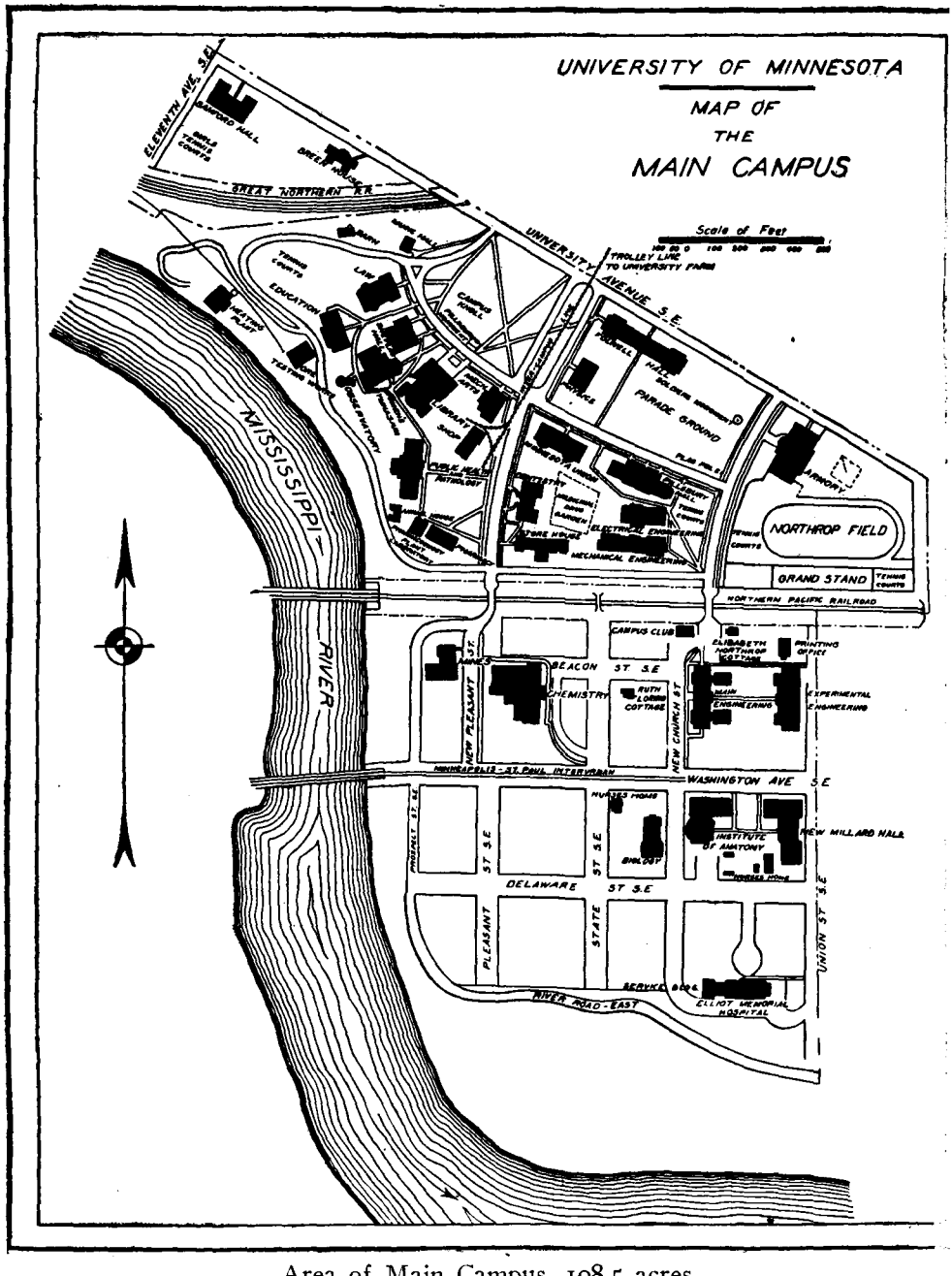
TABLE VI. COMPARATIVE REGISTRATION FIGURES, 1918-1920

College or school	Year 1918-1919			Year 1919-1920			Gain		Loss....	
	Men	Women	Total	Men	Women	Total	Men	Women	Men	Women
Science, Literature, and the Arts.....	839	1309	2148	2111	1635	3746	1272	326	....	.....
Engineering and Architecture	950	7	957	1199	14	1213	249	7	....	.....
Agriculture	1213	1572	2785	2299	1402	3701	1086	.....	....	170
Law	139	8	147	259	8	267	120	.....	....	.....
Medical (including Nursing and Embalming)	333	152	485	396	179	575	63	27	....	.....
Dentistry	341	6	347	389	11	400	48	5	....	.....
Mines	107	.....	107	158	.....	158	51	.....	....	.....
Pharmacy	82	31	113	86	31	117	4	.....	....	.....
Chemistry	139	12	151	168	8	176	29	.....	....	4
Education (including University High School)....	139	358	497	202	519	721	63	161	....	.....
Graduate	206	110	316	422	135	557	216	25	....	.....
Business	....	.....	.....	74	14	88	74	14	....	.....
War specials.....	....	.....	.....	22	.....	22	22	.....	....	.....
Summer session, Minneapolis campus (net)....	182	516	698	259	420	679	77	.....	....	96
S. A. T. C. (net)..	4164	.....	4164	.....	.....	.....	....	.....	4164	.....
Total	8834	4081	12915	8044	4376	12420	....	295	790	.....
Less duplicates....	79	30	109	170	70	240	....	40	—91	.....
Net total.....	8755	4051	12806	7874	4306	12180	....	255	881	.....
Extension:										
General	1130	976	2106	2526	2103	4629	1396	1127	....	.....
Correspondence .	190	210	400	451	301	752	261	91	....	.....
Total	1320	1186	2506	2977	2404	5381	1657	1218	....	.....
Less duplicates....	....	.....	.....	16	34	50	16	34	....	.....
Net total.....	1320	1186	2506	2961	2370	5331	1641	1184	....	.....
Summary:										
Total, residence students	8755	4051	12806	7874	4306	12180	....	255	881	.....
Total, extension students	1320	1186	2506	2961	2370	5331	1641	1184	....	.....
Grand total...	10075	5237	15312	10835	6676	17511	760	1439	....	.....
Less duplicates.....	19	50	69	80	105	185	61	55	....	.....
Net grand total	10056	5187	15243	10755	6571	17326	699	1384	....	.....

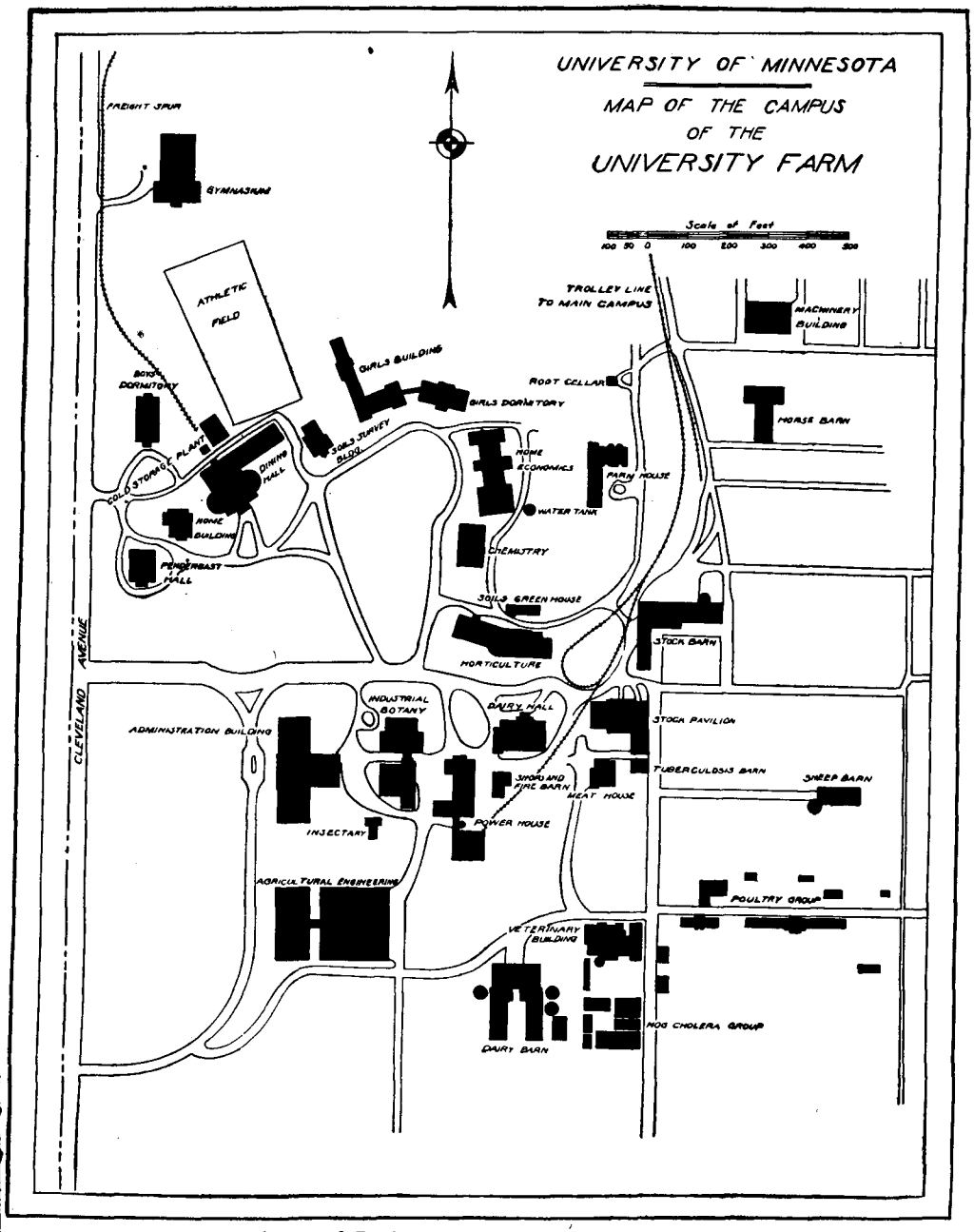
THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

ANNOUNCEMENT OF COURSES
FOR THE YEAR

1920-1921



Area of Main Campus, 108.5 acres



Area of University Farm, 422.56 acres

1920

JULY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
..	..	..	..	..	..	..

AUGUST

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..
..	..	..	..	..	..	..

SEPTEMBER

..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	**29**	**30**	..	..
..	..	..	..	..	..	..

OCTOBER

..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

NOVEMBER

.	1	**2**	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	**25**	26	27
28	29	30	..	..	..	..
..	..	..	..	..	..	..

DECEMBER

.	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	**23**	**24**	**25**
26	**27**	**28**	**29**	**30**	**31**	..
..	..	..	..	..	..	..

1921

JANUARY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	..	**1**
2	**3**	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	..	..	..	..	..

FEBRUARY

..	..	1	2	3	4	5
6	**7**	8	9	10	11	**12**
13	14	15	16	17	18	19
20	21	**22**	23	24	25	26
27	28	..	..	..	..	..
..	..	..	..	..	..	..

MARCH

..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	**25**	**26**
27	**28**	**29**	30	31	..	..
..	..	..	..	..	..	..

APRIL

..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
..	..	..	..	..	..	..

MAY

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	**30**	31	..	..	..	..
..	..	..	..	..	..	..

JUNE

..	..	..	1	**2**	3	4
5	6	7	8	9	10	11
12	13	14	**15**	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	..	..
..	..	..	..	..	..	..

JULY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2
3	**4**	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	.

AUGUST

..	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	..	..	..
..	..	..	..	..	..	..

SEPTEMBER

..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	**21**	**22**	23	24
25	26	27	**28**	29	30	..
..	..	..	..	..	..	..

OCTOBER

..	..	..	..	..	..	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	**20**	21	22
23	24	25	26	27	28	29
30	31	..	..	..		..

NOVEMBER

..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	**14**	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	..	..	..
.		.	..	..	..	..

DECEMBER

..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
..	..	..	..	..	..	..

UNIVERSITY CALENDAR

1920-1921

1920			
September	18	Saturday	Payment of fees closes except for new students
September	20-25		Registration of new students
September	21-28		Entrance examinations and examinations for the removal of conditions
September	27-28		Changes in registration
September	29	Wednesday	Fall quarter begins, 8:30 a.m.
October	21	Thursday	Senate meeting, 4:30 p.m.
November	2	Tuesday	Election day, a holiday
November	25	Thursday	Thanksgiving Day, a holiday
December	16	Thursday	Senate meeting, 4:30 p.m.
December	22	Wednesday	Fall quarter closes, 5:20 p.m.
December	31	Friday	Registration of new students
1921			
January	4	Tuesday	Winter quarter begins, 8:30 a.m.
February	12	Saturday	Lincoln's Birthday, a holiday
February	17	Thursday	Senate meeting, 4:30 p.m.
February	21 to March 5		Condition examinations
February	22	Tuesday	Washington's Birthday, a holiday
March	24	Thursday	Winter quarter ends, 5:20 p.m.
March	28	Monday	Registration of new students
March	30	Wednesday	Spring quarter begins, 8:30 a.m.
May	16-28		Condition examinations
May	19	Thursday	Senate meeting, 4:30 p.m.
May	30	Monday	Memorial Day, a holiday
June	12	Sunday	Baccalaureate service
June	14	Tuesday	Spring quarter closes, 9:00 p.m.
June	15	Wednesday	Forty-ninth annual commencement
June	17-18		Registration days for summer session
June	20	Monday	Summer session begins, 8:30 a.m.
July	4	Monday	Independence Day, a holiday
July	30	Saturday	Summer session closes

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

FACULTY

MARION LEROY BURTON, Ph.D., D.D., LL.D., President[1]
LOTUS DELTA COFFMAN, Ph.D., President-elect
WILLIAM WATTS FOLWELL, LL.D., President Emeritus
CYRUS NORTHROP, LL.D., President Emeritus
JOHN B. JOHNSTON, Ph.D., Dean, Professor of Neurology
EDWARD E. NICHOLSON, M.A., Dean of Student Affairs, Assistant Professor of Chemistry
JOSEPH M. THOMAS, Ph.D., Assistant Dean for the Senior College, Professor of Rhetoric, and Head of the Department of Rhetoric and Public Speaking
WILLIAM H. BUSSEY, Ph.D., Assistant Dean for the Junior College, Professor of Mathematics, and Chairman of the Department of Mathematics
ROYAL R. SHUMWAY, B.A., Assistant Dean for Students' Work and Associate Professor of Mathematics
CEPHAS D. ALLIN, LL.B., M.A., Professor of Political Science, Chairman of the Department of Political Science
WILLIAM ANDERSON, Ph.D., Assistant Professor of Political Science
LEON ARNAL, Architecte Diplômé Government France, Professor of Architecture
FRANCIS B. BARTON, Docteur de l'Université de Paris, Assistant Professor of Romance Languages
RALPH M. BARTON, B.A., Assistant Professor of Mathematics
JERE BAXTER, Major, U. S. A., Assistant Professor of Military Science and Tactics
JOSEPH W. BEACH, Ph.D., Associate Professor of English
RICHARD O. BEARD, M.D., Associate Professor of Physiology
LUTHER L. BERNARD, Ph.D., Associate Professor of Sociology
GUY R. BISBY, B.S., Assistant Professor of Plant Pathology and Botany
JOHN D. BLACK, Ph.D., Professor of Agricultural Economics
ROY G. BLAKEY, Ph.D., Professor of Economics
GISLE C. BOTHNE, M.A., Professor of Scandinavian Languages and Literatures, and Head of the Department of Scandinavian Languages
RAYMOND W. BRINK, Ph.D., Associate Professor of Mathematics
[2]THOMAS M. BRODERICK, Ph.D., Assistant Professor of Geology
CARLETON BROWN, Ph.D., Professor of English and Chairman of the Department of English
SOLON J. BUCK, Ph.D., Associate Professor of History

[1] Resigned, July 1, 1920.
[2] Absent on leave, 1920-21.

Oscar C. Burkhard, Ph.D., Assistant Professor of German
Richard Burton, Ph.D., Professor of English
Samuel C. Burton, M.A., Assistant Professor of Architecture
Frederic K. Butters, Ph.D., Associate Professor of Botany
Royal N. Chapman, Ph.D., Assistant Professor of Animal Biology
Lillian Cohen, Ph.D., Assistant Professor of Chemistry
Louis Joseph Cooke, M.D., Director of Physical Education for Men
William S. Cooper, Ph.D., Assistant Professor of Botany
William W. Cumberland, Ph.D., Associate Professor of Economics
Robert E. Cushman, Ph.D., Associate Professor of Political Science
James Davies, Ph.D., Assistant Professor of German
William Stearns Davis, Ph.D., Professor of Ancient History
Hermione L. Dealey, Ph.D., Assistant Professor of Educational Psychology
Z. Clark Dickinson, Ph.D., Assistant Professor of Economics
Hal Downey, Ph.D., Professor of Animal Biology
George W. Dowrie, Ph.D., Professor of Economics, Head of the Department of Economics
Elias J. Durand, D.Sc., Professor of Botany
Richard M. Elliott, Ph.D., Associate Professor of Psychology and Chairman of the Department of Psychology
Manuel C. Elmer, Ph.D., Associate Professor of Sociology
William H. Emmons, Ph.D., Professor of Geology, Head of the Department of Geology and Mineralogy
Charles A. Erdmann, M.D., Associate Professor of Applied Anatomy
Henry Anton Erikson, Ph.D., Professor of Physics, Chairman of the Department of Physics
Donald N. Ferguson, B.A., Assistant Professor of Pianoforte
Mabel R. Fernald, Ph.D., Assistant Professor of Psychology
Ben W. Field, Captain U. S. A., Assistant Professor of Military Science and Tactics
Ross L. Finney, Ph.D., Assistant Professor of Educational Sociology
[1]Oscar W. Firkins, M.A., Professor of English
Daniel Ford, M.A., Assistant Professor of Rhetoric
Guy Stanton Ford, Ph.D., Professor of History, Chairman of the Department of History
James H. Forsythe, M.A. in Arch., Assistant Professor of Architecture
William K. Foster, LL.M., Assistant Professor of Physical Education for Men
William S. Foster, Ph.D., Associate Professor of Psychology
George Bell Frankforter, Ph.D., Professor of Chemistry
Edward M. Freeman, Ph.D., Professor of Plant Pathology and Botany
Jules T. Frelin, B.A., Assistant Professor of Romance Languages
Robert W. French, B.S. in C.E., Assistant Professor of Drawing and Descriptive Geometry

[1] Absent on leave, 1920-21.

FREDERICK B. GARVER, Ph.D., Associate Professor of Economics
ISAAC W. GEIGER, Ph.D., Assistant Professor of Chemistry
[1]HARRIET I. GOLDSTEIN, Associate Professor of Drawing and Design
ALBERT G. GOODWYN, Lieutenant-Colonel, U. S. A., Professor of Military Science and Tactics
[2]JOHN E. GRANRUD, Ph.D., Professor of Latin
NORMAN SCOTT BRIEN GRAS, Ph.D., Professor of Economic History
JOHN HENRY GRAY, Ph.D., Professor of Economics
FRANK F. GROUT, Ph.D., Professor of Geology and Mineralogy
MELVIN E. HAGGERTY, Ph.D., Professor of Educational Psychology, Chairman of the Department of Educational Psychology
ALVIN HARVEY HANSEN, Ph.D., Associate Professor of Economics
WILLIAM L. HART, Ph.D., Associate Professor of Mathematics
LAWRENCE M. HENDERSON, Ph.D., Assistant Professor of Chemistry
ARTHUR T. HENRICI, M.D., Assistant Professor of Bacteriology and Immunology
PEDRO HENRÍQUEZ UREÑA, Abogado, Ph.D., Assistant Professor of Romance Languages
JAMES T. HILLHOUSE, Ph.D., Assistant Professor of Rhetoric
CLARENCE L. HOLMES, M.A., Assistant Professor of Agricultural Economics
RALPH E. HOUSE, Ph.D., Associate Professor of Romance Languages
NED L. HUFF, M.A., Assistant Professor of Botany
WILLIAM H. HUNTER, Ph.D., Associate Professor of Chemistry
CLARENCE MARTIN JACKSON, M.S., M.D., Professor of Anatomy and Director of the Department of Anatomy
DUNHAM JACKSON, Ph.D., Professor of Mathematics
ALBERT C. JAMES, B.A., M.B.A., Assistant Professor of Economics
ALBERT ERNEST JENKS, Ph.D., Professor of Anthropology, Chairman of the Department of Anthropology and Director of the Americanization Training Course
A. WALFRED JOHNSTON, M.A., Assistant Professor of Geology and Mineralogy
[3]LAUDER W. JONES, Ph.D., Professor of Chemistry, Head of the Department of Chemistry
ROY C. JONES, M.S. in Arch., Assistant Professor of Architecture
OSCAR W. JUNEK, Ph.D., Assistant Professor of Americanization
FRANCIS B. KINGSBURY, Ph.D., Assistant Professor of Physiologic Chemistry
WILLIAM H. KIRCHNER, B.S., Professor of Drawing and Descriptive Geometry and Head of the Department of Drawing and Descriptive Geometry
[4]MAY S. KISSOCK, B.A., Assistant Professor of Physical Education for Women

[1] Absent on leave, winter and spring quarters, 1920-21.
[2] Died March 29, 1920.
[3] Resigned, June 30, 1920.
[4] Absent on leave, 1920-21.

FREDERICK KLAEBER, Ph.D., Professor of Comparative and English Philology, Head of the Department of Comparative Philology
LEE I. KNIGHT, Ph.D., Professor of Botany
ALFRED E. KOENIG, M.A., Dr. Theol., Assistant Professor of German
LEONARD V. KOOS, Ph.D., Professor of Secondary Education
AUGUST CHARLES KREY, Ph.D., Associate Professor of History
SAMUEL KROESCH, Ph.D., Assistant Professor of German
WINFORD P. LARSON, M.D., Professor of Bacteriology and Immunology, Head of Department of Bacteriology and Immunology
KARL S. LASHLEY, Ph.D., Assistant Professor of Psychology
FRANCIS P. LEAVENWORTH, M.A., Professor of Astronomy, Head of the Department of Astronomy
IRVILLE C. LECOMPTE, Ph.D., Professor of Romance Languages
THOMAS G. LEE, B.S., M.D., Professor of Comparative Anatomy
ALBERT J. LOBB, Ph.B., L.L.B., Assistant Professor of Political Science
RUPERT C. LODGE, M.A., Assistant Professor of Philosophy
ELMER J. LUND, Ph.D., Associate Professor of Zoology
GUSTAV A. LUNDQUIST, M.A., Assistant Professor of Rural Sociology
ELIAS P. LYON, M.D., Ph.D., Professor of Physiology and Director of the Department of Physiology
JESSE F. MCCLENDON, Ph.D., Associate Professor of Physiology
FRANK H. MACDOUGALL, Ph.D., Associate Professor of Chemistry
FREDERICK M. MANN, M.S. in Arch., Professor of Architecture, Chairman of the Department of Architecture
EDGAR B. MOOMAU, First Lieutenant, U. S. A., Assistant Professor of Military Science and Tactics
CECIL A. MOORE, Ph.D., Associate Professor of English
WILLIAM MOORE, B.A., Associate Professor of Entomology
JOHN J. B. MORGAN, Ph.D., Assistant Professor of Psychology
BRUCE D. MUDGETT, Ph.D., Associate Professor of Economics
WALTER R. MYERS, Ph.D., Assistant Professor of German
HENRY F. NACHTRIEB, B.S., Professor of Animal Biology, Head of the Department of Animal Biology and Director of the Zoological Museum
CHARLES W. NICHOLS, Ph.D., Assistant Professor of Rhetoric
HOWARD S. NOBLE, B.A., M.B.A., Assistant Professor of Accounting
J. ANNA NORRIS, M.D., Professor of Physical Education for Women, Director of Health and Physical Education for Women
[1]GEORGE N. NORTHROP, M.A., Assistant Professor of English
[1]WALLACE NOTESTEIN, Ph.D., Professor of History
OSCAR W. OESTLUND, Ph.D., Assistant Professor of Animal Biology
EVERETT W. OLMSTED, Ph.D., Lit.D., Professor of Romance Languages, Head of the Department of Romance Languages
EUGENE F. PARKER, Ph.D., Assistant Professor of Romance Languages
E. MAUD PATCHIN, B.S., Assistant Professor of Textiles and Clothing

[1] Resigned, June 30, 1920.

CHAUNCEY J. V. PETTIBONE, Ph.D., Assistant Professor of Physiological Chemistry
ANNA A. H. PHELAN, Ph.D., Assistant Professor of Rhetoric
RUTH S. PHELPS, M.A., Associate Professor of Romance Languages
JOSEPH B. PIKE, M.A., Professor of Latin, Head of the Department of Latin
CHESSLEY J. POSEY, M.S., Assistant Professor of Geography
HAROLD QUIGLEY, Ph.D., Assistant Professor of Political Science
GEORGE H. PRUDDEN, Instructor in Architecture
NORMAN J. RADDER, B.A., Assistant Professor of Journalism
[1]ALBERT WILLIAM RANKIN, B.A., Professor of Education
FRANK M. RARIG, M.A., Associate Professor of Public Speaking
ANDREW T. RASMUSSEN, Ph.D., Associate Professor of Neurology
WILLIAM A. RILEY, Ph.D., Professor of Entomology
THOMAS S. ROBERTS, M.D., Professor of Ornithology and Associate Director of the Zoological Museum
CARL O. ROSENDAHL, Ph.D., Professor of Botany, Chairman of the Department of Botany
ARTHUR G. RUGGLES, M.A., Associate Professor of Entomology
MARTIN B. RUUD, Ph.D., Assistant Professor of Rhetoric
THOMAS H. SANDERS, M.Com., Assistant Professor of Accounting
CHARLES ALBERT SAVAGE, Ph.D., Professor of Greek, Chairman of the Department of Greek
RICHARD E. SCAMMON, Ph.D., Professor of Anatomy
CARL SCHLENKER, B.A., Professor of German, Chairman of the Department of German
CARLYLE M. SCOTT, Professor of Music, Chairman of the Department of Music
FREDERICK H. SCOTT, Ph.D., M.B., D.Sc., Professor of Physiology
COLBERT SEARLES, Ph.D., Professor of Romance Languages
LESTER B. SHIPPEE, Ph.D., Assistant Professor of History
CHARLES F. SIDENER, B.S., Professor of Chemistry
CHARLES P. SIGERFOOS, Ph.D., Professor of Zoology
EDWARD H. SIRICH, Ph.D., Assistant Professor of Romance Languages
M. CANNON SNEED, Ph.D., Associate Professor of Chemistry
ELVIN C. STAKMAN, M.A., Professor of Plant Pathology
CLINTON R. STAUFFER, Ph.D., Professor of Geology
J. WARREN STEHMAN, M.A., Assistant Professor of Economics
ELMER E. STOLL, Ph.D., Professor of English
ANDREW A. STOMBERG, M.S., Professor of Scandinavian Languages and Literatures
WILLIAM F. G. SWANN, Ph.D., Professor of Physics
DAVID F. SWENSON, B.S., Professor of Philosophy
FLETCHER H. SWIFT, Ph.D., Professor of Education
JOHN T. TATE, Ph.D., Professor of Physics

[1] Retired, June 30, 1920.

HARVEY G. THOMAS, First Lieutenant, U. S. A., Assistant Professor of Military Science and Tactics

JOSEPHINE E. TILDEN, M.S., Professor of Botany

[1]ARTHUR J. TODD, Ph.D. Professor of Sociology, Chairman of the Department of Sociology and Director of the Social and Civic Training Course

MASON W. TYLER, Ph.D., Assistant Professor of History

ANTHONY L. UNDERHILL, Ph.D., Associate Professor of Mathematics

MARVIN J. VAN WAGENEN, Ph.D., Assistant Professor of Educational Psychology

ELIZABETH VERMILYE, B.A., Assistant Professor of Home Management

LAWRENCE T. WALKER, Captain U. S. A., Assistant Professor of Military Science and Tactics

FREDERIC L. WASHBURN, M.A., Professor of Economic Vertebrate Zoology

LEE R. WATROUS, Jr., Captain U. S. A., Assistant Professor of Military Science and Tactics

MILDRED WEIGLEY, B.S., Professor of Home Economics and Chief of the Division of Home Economics

MARION WELLER, B.A., Associate Professor of History

LARS A. WELO, M.S., Ph.D., Assistant Professor of Physics

ALBERT B. WHITE, Ph.D., Professor of History

M. RUSSEL WILCOX, M.D., Assistant Professor of Physiology

NORMAN WILDE, Ph.D., Professor of Philosophy, Head of the Department of Philosophy

[1]HERBERT WOODROW, Ph.D., Associate Professor of Psychology

HOLBROOK WORKING, M.A., Assistant Professor of Agricultural Economics

QUINCY WRIGHT, Ph.D., Assistant Professor of Political Science

JEREMIAH S. YOUNG, Ph.D., Professor of Political Science

ANTHONY ZELENY, Ph.D., Professor of Physics

FRANK J. BRUNO, B.D., Lecturer in Sociology, Acting Chairman of the Department of Sociology

OTTO W. DAVIS, B.A., Lecturer in Sociology

J. FRANKLIN EBERSOLE, M.A., Ph.B., Professorial Lecturer in Economics

STANLEY GILLAM, M.A., Lecturer in Political Science

ANTONIO HERAS, Bachiller, Licenciado en Derecho, Professorial Lecturer in Romance Languages

C. O. JOHNSON, Lecturer in Architecture

LOUALLEN F. MILLER, M.A., Professorial Lecturer in Physics

ARTHUR R. NICHOLS, B.S., Special Lecturer in Architecture

JOHN H. SHERMAN, B.A., Professorial Lecturer in Economics

MABEL S. ULRICH, M.D., Lecturer in Social and Civic Work

EDWARD F. WAITE, LL.B., LL.M., Lecturer in Social and Civic Work

JEAN H. ALEXANDER, M.A., Instructor in Education

ROBERT ANTHONY, B.A., Instructor in Public Speaking

[1] Absent on leave, 1920-21.

LEON ARCHIBALD, B.Sc., Instructor in Drawing and Descriptive Geometry
OLIVE M. ATWOOD, B.A., Instructor in Mathematics
[1]GERTRUDE A. BAKER, Instructor in Physical Education for Women
HELEN A. BARR, B.A., Instructor in Physical Education for Women
WILLIAM O. BEAL, M.A., M.S., Assistant Astronomer
CECIL C. BEAN, M.A., Ph.B., Instructor in Rhetoric
CAROLINE BEDFORD, B.A., Supervisor of Practice Field Work in Social and Civic Work
ANNE BENTON, M.A., Instructor in Bacteriology
LOUIS A. BOETTIGER, M.A., Instructor in Sociology and Social Work
E. S. BROWN, M.D., Instructor in Physical Education for Men
THOMAS S. BUSSOM, B.A., Instructor in Romance Languages
ELIZABETH CAREY, M.A., Instructor in Rhetoric
JOHN O. CEDERBERG, Jr., Instructor in Drawing and Descriptive Geometry
CLYDE R. CHAMBERS, B.A., Instructor in Research in Agricultural Economics
HELEN S. CHAPMAN, B.A., Laboratory Instructor in Animal Biology
ALICE M. CHILD, Instructor in Home Economics
BERTHA W. CLARK, M.A., Instructor in Americanization
ELBRIDGE COLBY, M.A., Instructor in Rhetoric
ROBERT V. CRAM, Ph.D., Instructor in Latin
JOSEPH E. CUMMINGS, M.A., Instructor in Economics
ROBERT C. DAHLBERG, B.S., Instructor in Agricultural Botany
SOLOMON M. DELSON, Ph.B., Instructor in Romance Languages
K. VINA DOWNEY, M.A., Instructor in Physics
LYNWOOD G. DOWNS, M.A., Instructor in German
CHARLES B. DRAKE, M.A., Instructor in Romance Languages
CARL O. DUNBAR, Ph.D., Instructor in Geology
WILLIAM P. DUNN, B.D., M.A., Instructor in Rhetoric
GEORGE H. FAIRCLOUGH, Instructor in Music
WANDA FRAIKEN, M.A., Instructor in Rhetoric
THADDEUS P. GIDDINGS, Instructor in Public School Music
PERCY C. GLIDDEN, Instructor in Physical Education for Men
VETTA GOLDSTEIN, Instructor in Drawing and Design
ESTHER M. GREISHEIMER, B.S. in E., Ph.D., Instructor in Physiology
MARGUERITE GUINOTTE, Brevet Supérieur, Certificat d'Aptitude Pédagogique, Instructor in Romance Languages
JEFFERSON M. HAMILTON, Instructor in Architecture
LEWIS B. HESSLER, Ph.D., Instructor in Rhetoric
GERTRUDE R. HULL, Instructor in Voice
SIGURD B. HUSTVEDT, Ph.D., Instructor in Rhetoric
ELIZABETH JACKSON, Ph.D., Instructor in Rhetoric
RICHARD JENTE, Ph.D., Instructor in German
ARTHUR M. JOHNSON, Ph.D., Instructor in Botany
HARRISON W. JOHNSON, Instructor in Music

[1] Absent on leave, 1920-21.

PAUL KRAMER, B.A., Instructor in Romance Languages
VALERIA G. LADD, B.A. Instructor in Physical Education for Women
ALVIN H. LARSON, B.S., in Agr., Instructor in Plant Pathology and Botany
RUTH M. LINDQUIST, B.S., Instructor in Foods Management
CHARLES F. LINDSLEY, M.A., Instructor in Rhetoric
CHARLES E. LIVELY, M.A., Instructor in Sociology and Social Work
FRANCES E. LOWELL, Ph.D., Instructor in Psychology
DOROTHY LOYHED, M.A., Instructor in Rhetoric
MABEL C. MCDOWELL, B.S., Instructor in Home Economics
MALCOLM S. MACLEAN, B.A., Instructor in Rhetoric
ARIEL MACNAUGHTON, M.A., Instructor in Public Speaking
THOMAS R. MATHER, M.A., Instructor in Rhetoric
ROBERT M. MATHEWS, B.A., Instructor in Mathematics
ROBERT V. MERRILL, B.A., Instructor in Romance Languages
MARGARET K. MUMFORD, B.A., Instructor in Home Management and Nutrition
ALLEN G. NEWHALL, B.S., Instructor in Botany and Plant Pathology
HELEN PAINTER, B.A., Instructor in Rhetoric
BENJAMIN W. PALMER, M.A., LL.B., Instructor in Business Law
VICTOR H. PELZ, M.S., Instructor in Economics
ABE PEPINSKY, Instructor in Violin
JAMES T. PETERKIN, B.S., Instructor in Architecture
ETHEL L. PHELPS, B.S., Instructor in Textiles and Clothing
ARCHIE D. POWERS, M.A., Instructor in Physics
GERTRUDE REEVES, Instructor in Pianoforte
LLOYD H. REYERSON, Ph.D., Instructor in Chemistry
ADOLPH RINGOEN, Ph.D., Instructor in Animal Biology
HARRY W. ROBBINS, M.A., Instructor in Rhetoric
CARL B. ROEMER, Instructor in Physical Education for Men
OSWALD ROGNLEY, M.A., Instructor in Physics
STANLEY I. RYPINS, Ph.D., Instructor in Rhetoric
KARL SCHEURER, Instructor in Music
MINNA SCHICK, M.A., Instructor in Mathematics
GERTRUDE B. SCHILL, B.A., Instructor in Physical Education for Women
GEORGE M. SCHWARTZ, M.A., Instructor in Geology and Mineralogy
GEORGE M. STEPHENSON, Ph.D., Instructor in History
LAVINIA STINSON, B.A., Instructor in Home Economics
EMERSON G. SUTCLIFFE, Ph.D., Instructor in Rhetoric
MARION A. TEBBETTS, B.A., Supervisor of Practice Field Work in Social and Civic Work, Director of Hospital Social Service Department
GEORGE A. THIEL, B.A., Instructor in Geology and Mineralogy
ELLA A. M. THORP, B.A., Instructor in Mathematics
ARTHUR J. TIEJE, Ph.D., Instructor in Geology
ALICE J. H. TOLG, M.D., Instructor in Physical Education for Women
JOSEPH VALASEK, B.S., Instructor in Physics
GUSTAVE L. VAN ROOSBROECK, M.A., Instructor in Romance Languages
SAMUEL VASCONCELOS, LL.B., Abogado, Instructor in Romance Languages

HOWARD T. VIETS, M.A., Instructor in Rhetoric
GEORGE B. WATTS, M.A., Instructor in Romance Languages
GUY H. WOOLLETT, Ph.D., Instructor in Chemistry
PAUL T. YOUNG, Ph.D., Instructor in Psychology

ASSISTANTS AND SCHOLARS

1919-20

ANIMAL BIOLOGY

JOHN A. CEDERSTROM, Ph.B., Assistant
GEORGE H. CHILDS, M.A., Laboratory Assistant
ROLAND F. HUSSEY, B.A., Teaching Fellow
BRAND A. LEOPARD, Scholar
LEWIS E. NELSON, Laboratory Assistant
EMILY PAYNE, M.A., Assistant
ETHEL M. SLIDER, B.A., Technician
EDNA M. WOLF, M.A., Laboratory Assistant
CAROL YOUNG, Assistant

ANTHROPOLOGY

ALONZO GRACE, B.A., Scholar
EDWARD J. MATHIE, M.A., Assistant

BACTERIOLOGY AND IMMUNOLOGY

ROBERT G. GREEN, B.A., Assistant in Bacteriology and Immunology

BOTANY

ANNA P. FESSENDEN, B.A., Teaching Fellow
VINNIE A. PEASE, Ph.D., Technician
EDNA SONTAG, B.A., Assistant
EARL B. WORKING, M.A., Teaching Fellow

ECONOMICS

HAROLD R. KING, Student Helper in Economics

ENGLISH

ALEXANDER COWIE, B.A., Scholar
ADA M. BING, B.A., Scholar
DOROTHY HUDSON, B.A., Assistant
HELEN M. SCURR, M.A., Assistant

GEOLOGY

WILLIAM O. GEORGE, B.A., Scholar

GERMAN

ESTHER HENDRICKSON, B.A., Teaching Fellow
OTTO F. KUHLMAN, M.A., Assistant
EMILY SCHULTE, B.A., Scholar

FLORENCE SCHWARTZ, B.A., Assistant
ESTHER STRAND, B.A., Teaching Fellow

HISTORY

ALEXANDER AAS, B.A., Scholar
JOHN BARNHARD, B.A., B.D., Assistant
JOHN P. DAVISON, B.A., Teaching Fellow
GEORGINA DROITCOUR, B.A., Teaching Fellow
CHARLOTTE FARRINGTON, B.A., Teaching Fellow
OLIVER P. FIELD, B.A., Scholar
BERTHA HINSHAW, B.A., Assistant
GERTRUDE JACOBSON, M.A., Teaching Fellow
LOUISE LEONARD, B.A., Teaching Fellow
LILLIAN LUEHRS, Ph.B., Teaching Fellow
ELIZABETH M. LYNSKY, B.A., Teaching Fellow
ARTHUR J. NELSON, B.A., Scholar
MARION RUBINS, B.A., Teaching Fellow
EDITH P. STICKNEY, B.A., Teaching Fellow
FAITH THOMPSON, M.A., Teaching Fellow
ALICE FELT TYLER, M.A., Assistant

MATHEMATICS

ELIZABETH CARLSON, M.A., Assistant
CHA CHIEN, Scholar
CAREY M. JENSEN, M.A., Assistant
J. H. RHODES, B.S., Assistant

MUSIC

HELEN SCHMIDT, B.A., Assistant

PHYSICS

JAMES W. BROXON, B.A., Assistant
AUGUST DVORAK, B.A., Scholar
GERHARD ELLESTAD, B.A., Teaching Fellow
IWAS FUKUSHIMA, Assistant
CHRISTINA JOY HAMRIN, B.A., Teaching Fellow
FRANCES JOHNSON, M.A., Teaching Fellow
FRANK KRACEK, Assistant
CARL E. ROLLEFSON, Assistant
JENS M. RYSGAARD, B.A., B.S., Assistant
CHARLOTTE ZIMMERSCHEID, Assistant

PHILOSOPHY

LILLIAN GREENLEAF, M.A., Scholar

PSYCHOLOGY

Dorothy H. Brown, M.A., Teaching Fellow
Raymond O. Filter, M.A., Teaching Fellow
Eva Fillmore, B.A., Scholar
Josephine C. Foster, Ph.D., Assistant
Margaret Kincaid, M.A., Teaching Fellow
Oscar P. Pearson, B.A., Teaching Fellow
Lois C. Pelz, B.S., Scholar
Calvin P. Stone, M.A., Teaching Fellow

RHETORIC

Mary Ellen Chase, M.A., Assistant
Donald Countryman, Assistant
Guy L. Diffenbaugh, M.A., Assistant
Frances Kelley, M.A., Assistant
Tracy Peycke, B.A., Assistant
Alfred J. Schweppe, M.A., Assistant

ROMANCE LANGUAGES

Lucille Babcock, B.A., Assistant
Anna Cherry, B.A., Teaching Fellow
Ethel Elliott, B.A., Assistant
Camila Henríquez Ureña, M.A., Teaching Fellow
Josef A. Kindwall, Assistant
O. K. Lundeberg, B.A., Teaching Fellow
Andrew Morehouse, Assistant
Elizabeth Nissen, Teaching Fellow

SCANDINAVIAN

Carl E. Nordberg, M.A., Scholar

SOCIOLOGY

Ernest J. Meili, B.A., Scholar
Edwin F. Morse, Scholar
Andrew N. Wray, Teaching Fellow
Anne Van der Hagen, B.A., Scholar

GENERAL INFORMATION

ADMISSION

To the freshman year.—Admission is either by certificate or by examination. Candidates must have completed the equivalent of a four-year high-school course and must present:

1. Four units of English; or three units of English and four units of a foreign language; or three units of English and two units of each of two foreign languages.
2. One unit of algebra and one unit of plane geometry.
3. Enough additional work to make in all fifteen units, of which not more than four may be in Group F (vocational and miscellaneous subjects).

A detailed statement of admission requirements may be found in the bulletin of general information.

To advanced standing.—Attention is called to the following rules governing students entering with advanced standing.

Credits of advanced standing are provisional and are finally adjusted upon the following basis: Any student who, after one year's residence, has failures in nine credits or more shall lose all advanced credit except in those courses which have been continued in this college with a grade of at least C. Credits forfeited in this way can be recovered only by special examination.

Students entering with advanced standing must earn an average of one honor point per credit for all work in this college which is to be counted toward a degree.

A student admitted to the Senior College and failing to meet this requirement may be excluded from the Senior College at any time after the first quarter.

CLASS ROUTINE AND SCHOLASTIC REQUIREMENTS

Schedule.—Classes are held every week-day, ending for the week at 12:20 p.m. on Saturday. Class periods begin at 8:30, 9:30, 10:30, 11:30 a.m., 1:30, 2:30, 3:30, and 4:30 p.m., and continue fifty minutes. A convocation of faculty and students is held at 11:30 on certain Thursdays.

In the Junior College, courses are normally five-credit courses; in the Senior College, three-credit courses. There are also three-credit courses in the Junior College and one, two, four, and five-credit courses in the Senior College.

Examinations and grades.—Examinations are held at the close of each quarter. A student's grade is based on class work and examinations. Four grades, A, B, C, and D are given for work done satisfactorily. Work not done satisfactorily is marked E (condition) or F (failure). Work of a satisfactory character but not completed is marked I (incomplete). For rules governing the removal of incompletes and conditions, see the faculty regulations.

Credits and honor points.—Requirements for graduation are expressed in credits, indicating amount of work, and in honor points, indicating grade of work. Each credit demands on the average three hours a week of the student's time; that is, one recitation with two hours of preparation, or three hours of laboratory work. Honor points are computed as follows; each credit with the grade of A carries three honor points; each credit with the grade of B, two honor points; each credit with the grade of C, one honor point.

Reasonable advance toward graduation.—Continued residence in the college is conditioned upon reasonable advance toward graduation. The Students' Work Committee may at any time drop from the rolls of the college any student who does not make such reasonable advance. A student so dropped will not be allowed to reënter the University until a full quarter has elapsed.

No student will be considered to have a wholly satisfactory standing who fails to secure, in the course of any year, the normal advance of one honor point for each credit for which he is registered. Students who fall below this normal standard will be subject to special consideration as individual cases by the Students' Work Committee.

Habitual bad English.—Any student who, either in speaking or in writing, habitually uses bad English will be reported by his instructor to the dean with all available evidence. If the dean considers this evidence sufficient, he will require the student to take without credit such further work in rhetoric as the head of the Department of Rhetoric shall specify.

THE JUNIOR AND SENIOR COLLEGES

1. The college distinguishes between the Junior College, consisting of the first two years, and the Senior College, consisting of the third and fourth years.

2. Courses which are intended primarily for freshmen and sophomores are designated Junior College courses; those intended primarily for juniors and seniors are designated Senior College courses.

3. Senior College courses appear in the announcement as open to "juniors and seniors" or to "juniors, seniors, and graduates." The prerequisites for these courses are governed by the following rule: If the prerequisite courses are open to freshmen in their first and second quarters, they must amount to at least fifteen credits; if not, they must amount to at least ten credits.

Senior College courses may be taken by sophomores who have had one honor point per credit in their previous work, and have completed with a grade of C the prerequisites for the courses desired; but courses which carry graduate credit may not be taken earlier than the third quarter of the students' sophomore year.

4. Students registered in combined courses shall secure forty-five credits and forty-five honor points per year (three quarters) of work required in this college before being recommended for entrance to the

work of the professional school. In order that such students may receive the Bachelor's degree after completion of the required professional work, the faculty of the professional school shall certify that they have maintained an equivalent standing in the work of the professional school which is counted toward the degree given by this college.

5. Any student who fails to complete the Junior or Senior College requirements within the normal period will, in order to complete the work, be required to continue in that college for one or more University sessions. During this period, he will be required to secure an average of one honor point for every credit of work for which he is registered.

FACULTY ADVISERS FOR STUDENTS

In the Junior College.—Every freshman is assigned to a class officer whose general purpose is to help the student to get the best out of his college course, to develop his responsibility for planning his work, and to encourage him to make the most of his own powers. The student should go to his class officer for information and help in all matters pertaining to his college work.

The class officer discusses with the student the selection of studies and approves his program and registration; gives information or sends the student to the best source of information about the choice of a vocation and the preparation for it; helps the student to understand the proper sequence of studies and the relationship of various fields of study to the main purpose toward which the student is aiming. Living conditions, methods of study, and the other activities of the student strongly influence college work and are subjects for consideration by the class officers.

The efforts made to aid and advise the student call for prompt response on his part. Every student is required to attend conferences when notified and to follow the instructions of his class officer.

In the sophomore year the class officer gives especial attention to the completion of the requirements of the Junior College and the preparation for the major study in the Senior College.

In the Senior College.—When the student has chosen his major subject, he is assigned by the department in charge of that subject to a major adviser who has oversight of all his scholastic work in the Senior College.

AUDITORS

Persons who wish to hear lectures and class discussions regularly are registered as auditors and pay a prescribed fee. They must first secure the permission of the instructor in charge of the course and of the dean. Admission of auditors may be denied in case of classes which are crowded or in which the work is of such a nature that the presence of visitors would be a detriment. Regularly enrolled students are not admitted as auditors.

COURSES OF STUDY

A student may, while registered in the College of Science, Literature, and the Arts, pursue one of the following courses:

Courses given within this college:

1. A general course leading to the degree of Bachelor of Arts.

2. A four-year course leading to the degree of Bachelor of Music.

3. A four-year course in Architecture and Decoration leading to the degree of Bachelor of Science.

4. A four-year course in Americanization Training Work leading to the degree of Bachelor of Science.

5. A five-year course in Training for Social and Civic Work leading to the degree of Bachelor of Science.

6. A five-year course in Training for Diplomatic and Consular Service leading to the degree of Bachelor of Arts.

7. A five-year course in Training for State and Federal Administration leading to the degree of Bachelor of Arts.

8. A five-year course in Training for Municipal Administration and Engineering leading to the degree of Bachelor of Science.

9. A two-year course prescribed for admission to the School of Business.

10. A two-year general course entitling him to admission to the College of Education, on the completion of the Junior College requirements.

11. A two-year general course entitling him to admission to the Law School, on the completion of the Junior College requirements.

12. A one-year course prescribed for admission to the College of Dentistry.

In each of the five-year courses the student may become a candidate for the Master's degree under the regulations of the Graduate School.

Combined arts and professional courses:

A five-year course leading to the degrees of Bachelor of Arts and Bachelor of Science in Chemistry.

An eight-year course leading to the degrees of Bachelor of Arts and Doctor of Medicine.

A seven-year course leading to the degrees of Bachelor of Science and Doctor of Medicine.

A six-year course leading to the degree of Bachelor of Arts and Doctor of Dental Surgery.

A five-year course leading to the degree of Bachelor of Science and Certificate in Nursing.

A four-year course leading to the degree of Bachelor of Arts with special training in military science and tactics.

A six-year course leading to the degree of Bachelor of Science and the appropriate degree in architecture.

A six-year course leading to the degrees of Bachelor of Arts and Bachelor of Laws.

REGULATIONS APPLYING TO ALL COURSES

Military drill is required of all freshman and sophomore men and physical education of all freshman men and all freshman and sophomore women.

Rhetoric-English A-B-C (or in some courses Rhetoric 4-5-6) is required of all students in their freshman or sophomore year.

No student may elect work in any quarter in more than five departments.

Students must elect at least 13 credits of work a week. Permission to take less than that number must be secured from the Administrative Board.

Students ordinarily may not elect more than 17 credits. After the freshman year a student who has an average of 1½ honor points per credit for the previous quarter, or the previous two quarters, and who has no condition or failure the previous quarter may elect 18 credits.

All freshmen and sophomores are required to elect one third of their credit hours in the afternoon.

I. GENERAL COURSE LEADING TO THE DEGREE OF BACHELOR OF ARTS

The requirements for the degree of Bachelor of Arts are stated below. For the year 1920-21, seniors will complete their work in accordance with either curriculum. Students entering the Senior College in the fall of 1920 or thereafter will follow the new Senior College curriculum. Students enrolled in the Junior College in 1919-20 may complete the Junior College requirements on either the new or the old plan, at their option.

GENERAL REQUIREMENTS

1. The student must earn 180 credits and 180 honor points.

2. The student may not receive credit for beginning courses (two quarters, 10 credits) in more than one of the foreign languages, except Greek and Italian, unless his major adviser approves such courses as necessary for the proper development of the student's major work.

3. Not later than the end of his sophomore year, each student must elect the department in which he intends to do his major work. He will then be assigned to a major adviser by that department.

4. The student must earn at least 45 credits in residence at this college. If the term of residence is only one year, that year must be the senior year; and in any case, he must spend at least two "quarters" of the senior year in residence.

NEW CURRICULUM

Junior College

(Required for students entering the Junior College in September, 1920; optional for students who entered the Junior College before September, 1920.)

Departments offering Junior College courses are grouped as follows:

Group A English, Rhetoric, Public Speaking.
Group B Foreign languages: German, Greek, Latin, Romance Languages, Scandinavian.
Group C Social sciences: Anthropology, Economics, History, Political Science, Sociology.
Group D Natural sciences: Animal Biology, Astronomy, Bacteriology and Immunology, Botany, Chemistry, Geology and Mineralogy, Human Physiology, Physics, Psychology.
Group E Mathematics, Philosophy.

REQUIREMENTS FOR THE JUNIOR COLLEGE

1. Group A 15 credits in English-Rhetoric.
Group B The student must present for entrance four years of one foreign language, or he must complete 20 credits in one language in college, or he must continue a language, which he presented for entrance, according to the following schedule:

Amount Presented for Entrance	*Amount Required in Junior College*
Four years of one language	None
Three years of one language	5 credits in same language
Two years of one language	10 credits in same language
Less than two years of one language	20 credits in one language

Group C 10 credits in one subject
Group D 10 credits in one subject (courses in physiography and geography do not meet this requirement)
Group E No requirement

2. Two of these required subjects must be begun the first quarter and the others not later than the fourth quarter of a student's course. A subject taken to meet one of these requirements must be continued for at least two quarters.

3. The student must earn 15 additional credits in each of two of the five groups, A, B, C, D, E.

4. The student must earn a total of 90 credits and 90 honor points.

Senior College

(Required for students entering the Senior College in September, 1920; optional for students who entered the Senior College before September, 1920.)

Admission.—For admission to the Senior College a student must have satisfied the requirements of the Junior College. In September, 1920, any student will be admitted to the Senior College if he has satisfied the requirements of the Junior College as stated in the bulletin for 1918-19, or as given here under New Curriculum, or as given below under Old Curriculum. The new curriculum demands 90 credits and 90 honor points; the other two demand 84 credits and 84 honor points.

Requirements.—1. A major sequence, 27 to 36 credits. Each student must complete a coherent and progressive sequence of courses, known as a major sequence, which shall include, as specified by the department which offers it, from 27 to 36 credits in Senior College courses. Such

major sequences are offered by the following departments: Animal Biology, Astronomy, Bacteriology, Botany, Chemistry, Economics, English, Rhetoric, and Public Speaking, Geology and Mineralogy, German, Greek, History, Human Anatomy, Human Physiology, Latin, Mathematics, Philosophy, Physics, Political Science, Psychology, Romance Languages, Sociology. The courses constituting a major sequence in any department are announced in the departmental statement.

2. A minor sequence, 9 credits. A student must secure in some department other than his major department and in addition to his major sequence, 9 credits in Senior College courses.

OLD CURRICULUM

Junior College

(Optional for students who entered the Junior College before September, 1920.)

During the first two years the student must complete the following required subjects:

a. Rhetoric-English, 15 credits.

b. History, 10 credits.

c. Laboratory science (chemistry, physics, botany, animal biology), 10 credits.

d. A foreign language, 10 to 15 credits according to the amount of high-school preparation as follows:

High-school work less than two units of one foreign language; college requirements, 15 credits. High-school work two or more units of one foreign language; college requirements 10 credits if the same language is pursued in college, otherwise, 15 credits.

Two of these required subjects must be begun the first quarter and the other two not later than the fourth quarter of a student's course.

When a required subject is begun, it must be continued for at least two quarters.

Senior College

(Optional for students who entered the Senior College before September, 1920.)

The work of the Senior College must include at least 45 credits in Senior College courses, with at least 18 credits in Senior College courses in one department.

SPECIAL REGULATIONS

Bachelor of Arts with Honors.—Students already registered for the Honors Course will find the requirements stated on page 23 of the bulletin for 1919-20.

Election of subjects in other colleges or schools.—In the senior year, any student registered in the College of Science, Literature, and the Arts may elect not to exceed 6 credits per quarter in any other college or school of this University, provided that (1) the courses are indicated by the dean of the college or school in question and approved by

the Advisory Committee of this college as suitable for such election; (2) no duplication of subjects occurs; and (3) the subjects so elected are specifically approved by the major adviser. Courses so taken are counted toward the Bachelor of Arts degree on the same terms as those taken in the College of Science, Literature, and the Arts.

By resolution of the Board of Regents students in any college electing work in any other college must complete the work so elected before they are allowed to come up for the degree for which they are candidates.

Seniors desiring further information regarding courses open should consult the assistant dean for the Senior College.

Extension courses.—Credits received in University extension courses are counted as credits in this college only after the student has completed one year of work in the college and has met the requirements of the department concerned.

Correspondence courses.—The equivalent of some of the introductory courses in various departments is offered by correspondence under the auspices of the General Extension Division. Those desiring information regarding such courses should consult the General Extension Division.

II. FOUR-YEAR COURSE IN ARTS AND MUSIC LEADING TO THE DEGREE OF BACHELOR OF MUSIC

The University of Minnesota offers a four-year course leading to the degree of Bachelor of Music. The aim of this course is two-fold: to provide the best available training in practical music, and to lay the foundation for a true understanding of music as literature—that is, as a vital element in modern culture. For the attainment of the first end, thoro courses in the theory, history, and the appreciation of music are required; to achieve the second, the student is given a background of history, literature, and science, these courses being in many cases especially arranged by the faculties of the various departments to parallel and supplement the work given by the Department of Music. The course is designed to meet the requirements of students who wish the cultural benefits of a college education, but whose aptitude in music would lead them to forego these benefits if music were not made a primary interest in their work.

In the field of practical music the greatest pains are expended in developing the individual student's talent. But the University recognizes the fact that many students who have neither the desire nor the capacity for the arduous career of concert performers are much better fitted than the average practical musician for the work of teaching. For such students unique opportunities for study in the special fields of public-school music are provided together with practical instruction in instrumental teaching. The University thus, at a charge considerably smaller than is asked by private instructors of the first rank or by conservatories of

music, not only offers every facility for practical music study, but prepares its students to occupy the position of broadly educated and influential members of the musical community in which they shall find themselves after graduation.

The requirements for admission are the same as for admission to the freshman class in the General Course, together with one of the following requirements in music, according to the instrument selected:

Pianoforte: Candidate must be able to play Czerny's *School of Velocity,* and the easier Haydn and Mozart sonatas.

Violin: Candidate must be able to play the first ten studies of the Kreutzer *Etudes.*

Voice: Candidate must possess good natural equipment, and have some previous musical training.

Orchestral instruments: Candidate must pass entrance examinations equal to the grade required of candidates who wish to select violin. Students from high schools granting credit in music toward graduation may present four units in music for entrance.

The number of credits required for the degree in music is 180, not counting military drill or physical education, which are required the same as for the Bachelor of Arts degree. During the four years the student must earn 180 honor points, including 48 honor points in applied music.

The one-half hour lessons, plus twelve to fifteen hours' practice a week for one quarter, are required in order to gain 4 credits in applied music.

Students who elect voice as their major study must earn 30 credits and, by special permission of the faculty of the department, may be allowed to earn 36 credits in voice during the four years. During each of the first two years 6 credits must be earned in voice and 6 in piano. In the junior year the student may be permitted, and in the senior year will be expected, to take additional work in voice in place of the instrumental work.

Students who elect other subjects than voice as their major must earn 36 credits in the chosen subjects, specializing in the junior and senior years.

OUTLINE OF COURSE

Freshman Year

(Not less than 15 credits each quarter)

1. Elect 4 credits from A, or 4 from B, including Voice

A		B	
Piano	(4)	Piano	(2)
Violin	(4)	Violin	(2)
Cello	(4)	Voice	(2)
Organ	(4)	Cello	(2)
		Organ	(2)

2. Harmony (3)
3. Rhetoric (5)
4. History (3)
5. Physical Education (no credit)
   Elective, Orchestra (1), Choir (1)

Sophomore Year

Beginning with the sophomore year, students are divided into three groups: I, Normal piano; II, Public-school music; III, General.

Group II, Public-school music, register in the College of Education their junior year.

(Not less than 15 credits each quarter)

All groups. 1. Elect 4 credits from A, or 4 credits from B, including Voice.

A		B	
Piano	(4)	Piano	(2)
Violin	(4)	Violin	(2)
Cello	(4)	Voice	(2)
Organ	(4)	Cello	(2)
		Organ	(2)

2. Counterpoint (2)
3. (Groups I and III) History of Music (3)

   or

   (Group II) Psychology (3) first and second quarters: Acoustics (3) third quarter.
4. Modern language (5)
5. Appreciation of Music (1)
6. Ear-Training (no credit)
   Elective, Orchestra (1), Choir (1)

Junior Year

(Not less than 16 credits each quarter)

All groups. 1. Elect 4 credits from A, or 4 from B, including Voice

A		B	
Piano	(4)	Piano	(2)
Violin	(4)	Violin	(2)
Voice	(4)	Voice	(2)
Cello	(4)	Cello	(2)
Organ	(4)	Organ	(2)

Group I. 2. Romantic Movement (3)
3. Normal Piano (3)
4. Ear-Training (no credit)
5. Introduction to Sociology (5) first quarter; Problems of Philosophy (5) second quarter; Esthetics (3) third quarter.
6. Psychology (3) first and second quarters; Acoustics (3) third quarter.

Group II. 2. Romantic Movement (3) or elective (3)
3. Public-School Music (3)
4. History of Education (3) first quarter; Educational Psychology (3) second quarter; Technique of Teaching (3) Educational Sociology (3) third quarter.
5. History of Music (3)

Group III. 2. Romantic Movement (3)
3. Introduction to Sociology (5) first quarter; Problems of Philosophy (5) second quarter; Esthetics (3) third quarter.
4. Advanced Harmony (2)
5. Elective (3 or 5)

Senior Year

(Not less than 14 credits each quarter)

All groups. 1. Elect 4 credits from A, or 4 credits from B, including Voice.

A		B	
Piano	(4)	Piano	(2)
Violin	(4)	Violin	(2)
Voice	(4)		
Cello	(4)		
Organ	(4)		

Groups I and II. 2. Bach and Beethoven, first and second quarters; Wagner and Brahms, third quarter (2)
3. Normal Piano (3) or Public-School Music (3)
4. Ensemble (1)
5. Analysis (1)
6. Elective (3)
Elective, Orchestra (1), Choir (1)

Group III. 2. Bach and Beethoven (2)
3. Ensemble (1)
4. Analysis (1)
5. Advanced Counterpoint (2)
6. Elective (5 or 6)

III. FOUR-YEAR COURSE IN ARCHITECTURE AND DECORATION LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

This course offers to students of the College of Science, Literature, and the Arts the opportunity to prepare themselves for certain lines of work such as domestic architecture and interior decoration without taking the full technical course in Architecture.

Students registering in this course should secure the approval of the staff in Architecture, and the advice of the staff should be sought with regard to the choice of electives and of special courses in architecture.

FRESHMAN YEAR

Fall	Credits	Winter	Credits	Spring	Credits
Mathematics	5	Mathematics	5	Med. history	5
Rhetoric	5	Rhetoric	5	English	5
Language	5	Language	5	Language	5

SOPHOMORE YEAR

	Credits		Credits		Credits
Med. history	5	Elective	5	Elective	5
English	5	Physics	5	Physics	5
Architecture	5	Architecture	5	Architecture	5

JUNIOR YEAR

	Credits
Architecture	27
Electives	18

SENIOR YEAR

	Credits
Architecture	36
Electives	9

IV. FOUR-YEAR COURSE IN AMERICANIZATION TRAINING WORK LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

FRESHMAN YEAR

Required	Credits
Rhetoric-English	15
Modern European History (1-2)	10
American History	5
General Zoology	10
Introduction to Anthropology	5

SOPHOMORE YEAR

Required	Credits	Electives
Modern language	9 or 15	Public Speaking
American History (continued)	5	Modern language
American Government	5	Geography
General Anthropology	3	Modern Social Reform Movements
General Immigration	3	Cultural Anthropology
General Psychology	9	Elements of Educational Psychology
Electives	9 to 18	Food Preparation
		Elementary Dietetics
		Ethnology

JUNIOR YEAR

In the Senior College (junior and senior years) the electives of individual students will vary much, depending on the phases of work and the groups of peoples in which the student is specializing. All electives must be approved by the director.

Required	Credits	Electives
American People	9	Supervised Americanization Work
Technique, Methods, and Organization of Americanization Work	9	Municipal Government
General Economics	10	State and Local Government
Electives	18 to 23	Immigrant Woman
Aliens' Viewpoints		Race Leaders and Programs
Special lectures by race leaders		Labor Problems
		Statistics
		Elementary Dietetics
		Housing Problems
		Home Management
		Social Psychology
		History of Education
		Educational Sociology
		Physical Anthropology
		Political and Social Ethics

SENIOR YEAR

Required	Credits	Electives
American Negro	3	Negro and Immigrant Adjustments
Government and the Immigrant	3	Slavic Culture
Supervised Americanization Work (if not previously elected)	9	Slavic Oral Language[1]
Race Leaders and Programs (if not previously elected)	6	Genetics and Eugenics
		Social Statistics
		Socialism
		Child Welfare
		Philippine Peoples
		Municipal Problems
		Mental Diagnosis

For the requirements for teachers' certificate in americanization training, see bulletin of College of Education.

For courses in home economics open to students in americanization course, see statement of Department of Home Economics.

V. FIVE-YEAR COURSE IN SOCIAL AND CIVIC WORK LEADING TO THE DEGREES OF BACHELOR OF SCIENCE AND MASTER OF ARTS

This course is organized in response to a demand for distinctive technical training for professional social service. It covers both undergraduate and graduate work. Satisfactory completion of the four-year course leads to the degree of Bachelor of Science. A fifth year's work is designed leading primarily to a special certificate of proficiency; but students whose programs satisfy the requirements of both the training course and the Graduate School may receive the degree of Master of Arts in addition to the special certificate.

[1] This course is open only to students who are specializing in the americanization work.

The organization of the course of study aims to give the undergraduate the fundamentals of a broad modern education with considerable emphasis upon history, economics, political science, psychology, and language. To this end all intensive specialization is reserved for the fourth and later years of study.

The fourth year includes comparatively few required courses, but a long list of advised electives, for which other electives may be substituted according to the individual student's needs. While the four-year course as arranged should confer upon the student a certain degree of familiarity with the problems of social and civic work, really adequate professional preparation demands at least one year of graduate study. With this professional instruction in view, during the fifth and later years of study only an irreducible minimum of specified courses is required; the emphasis is laid upon providing individual programs to meet the student's special inclination, aptitudes, or need.

FIRST AND SECOND YEARS

Required	Elective
Sociology	Sociology
Introduction to Sociology	Modern Social Reform Movements
Economics	Animal Biology
Principles of Economics	General Zoology
Political Science	Anthropology
American Government	Cultural Anthropology
Psychology	Philosophy
General Psychology	Logic
Additional courses to satisfy the Junior College requirements	Ethics

THIRD YEAR

Required	Elective
Sociology	Sociology
Background of Dependency and Defectiveness	Rural Sociology
Treatment of Defectives and Dependents	Social Control
Treatment of Delinquents	Social Organization
Child Welfare	Social Psychology
Housing	[State Care of Dependents, Defectives, and Delinquents][1]
Legal Protection of the Child	Anthropology
Economics	Physical Anthropology
Labor Problems	The American Negro
Political Science	Bacteriology
Municipal Government	General Bacteriology
	Economics
	Labor and Reform Movements
	Trade Unionism
	Education
	Educational Sociology
	History of Education
	Pathology and Public Health (Medical School)
	Preventive Medicine and Hygiene
	Philosophy
	History of Philosophy
	Political Science
	State and Local Government
	Elementary Law

[1] Courses in brackets not offered in 1920-21.

FOURTH YEAR AND GRADUATE WORK

REQUIRED

Sociology
- Social Psychology (if not already elected)
- Methods of Social Investigation
- The Family
- Social Progress

Methods of Community Organization and Social Work in Small Towns and Country

ELECTIVE

Sociology
- Medical Social Service
- Social Statistics
- Mental Case Work
- Charitable Administration, Finance, and Publicity
- Supervised Field Practice Work
- Technique of Family Treatment
- Juvenile Courts and Probation
- [Settlement and Community Center Work][1]
- [Elements of Social Hygiene and Community Protective Work]
- Rural Social Institutions
- History of Social Theory
- Contemporary Social Theory
- Seminars in Sociology

Animal Biology
- Genetics and Eugenics

Anthropology
- Older Immigrants
- Newer Immigrants
- General Immigration

Civil Engineering
- Sanitary Engineering

Economics
- Public Finance
- Principles of Accounting
- Industrial Relations

Home Economics
- Food Preparation in Relation to Social Work
- Elementary Dietetics for the Social Worker
- Home Management Problems for the Social Worker
- Child Training

Physical Education
- Hygiene of the Family
- Folk Dancing and Organized Games

Political Science
- Constitutional Law
- Legislative Power and Methods
- Police Power

Psychology
- Abnormal Psychology
- Mental Tests and Mental Diagnosis

Philosophy
- Political and Social Ethics

Agricultural Education
- History of Agriculture

NOTE: For a fifth year's work consisting of 9 hours' class work and 12 hours of supervised field work per week for three quarters the student will receive a special certificate. He will be eligible for the Master's degree if his program is approved by the Graduate School and if he prepares a satisfactory thesis in addition to the work required for the special certificate.

[1] Courses in brackets not offered in 1920-21.

VI. A FIVE-YEAR COURSE IN TRAINING FOR DIPLOMATIC AND CONSULAR SERVICE

The degree of Bachelor of Arts is conferred at the end of four years. Students whose programs satisfy the requirements of the Graduate School may receive the degree of Master of Arts at the end of the fifth year.

JUNIOR COLLEGE

First Year

	Credits
Rhetoric-English	15
Modern language	15
History	10
American Government	5
	45

Second Year

Comparative European Government	5
Language	10
Economics	10
Natural science	10
Electives	10
	45

SENIOR COLLEGE

In the Senior College the student will take major sequence E in political science and such additional work in economics, history, and law, not exceeding 30 credits, as may be prescribed by the major adviser and the committee in charge of the course.

In foreign languages, 15 credits, or at least a minor sequence. A speaking knowledge of one language is required and a thoro reading knowledge of a second.

Electives to make up a total of not less than 90 credits in this college.

The selection of these courses will be made under the direction of the major adviser and the committee in charge of the course.

GRADUATE SCHOOL

In the fifth year the student will take the following work:

Research in economics or political science for the consular service.

Research in history or political science for the diplomatic service.

Additional Senior College courses in history, economics, law, or political science, to be selected by the student under the direction of the Graduate School and the committee in charge of the course.

VII. A FIVE-YEAR COURSE OF TRAINING FOR STATE AND FEDERAL ADMINISTRATION

The degree of Bachelor of Arts is conferred at the end of four years. Students whose programs satisfy the requirements of the Graduate School may receive the degree of Master of Arts at the end of the fifth year.

JUNIOR COLLEGE

First Year

	Credits
Rhetoric-English	15
History	10
American Government	5
Modern language sufficient to fulfill the Junior College requirements	15
Electives sufficient to make up 45 credits for the first year	15
	45

Second Year

Natural science	10
General Economics	10
State and Local Government or Municipal Government	5
Electives	20
	45

SENIOR COLLEGE

In the Senior College the student will take major sequence A or F in Political Science.

In economics 18 credits selected from the following courses: Public Finance, State and Local Taxation, Labor Problems, Economics of Transportation, Statistics, Business and Government, Public Utilities and Financial History of the United States.

In history 9 credits selected from Economic History of the United States, Recent American History, History of Minnesota, and Constitutional History of the United States.

Electives to make up a total of not less than 90 credits in this college.

The selection of these courses will be made under the direction of the major adviser and the committee in charge of the course.

GRADUATE SCHOOL

In the fifth year the student will take the following work:

Research in the field of American government or administration.

Additional Senior College courses in history, economics, law, or political science, to be selected by the student under the direction of the Graduate School and the committee in charge of the course.

VIII. A FIVE-YEAR COURSE OF TRAINING FOR MUNICIPAL ADMINISTRATION AND ENGINEERING

The degree of Bachelor of Science is conferred at the end of four years. Students whose programs satisfy the requirements of the Graduate School may receive the Master's degree at the end of the fifth year.

FIRST YEAR

	Credits
Rhetoric-English	15
Modern language	10
Engineering mathematics	10 or 15
American Government	5
Electives	5 or 0
	45

SECOND YEAR

	Credits
Municipal Government	5
General Economics	10
History	10
Physics	10
Drawing	5
Electives	5
	45

THIRD AND FOURTH YEARS

Political Science
- Municipal Corporations[1]
- Municipal Problems[1]
- Research in Municipal Administration[1]
- Business Law
- Police Power
- Government of Minnesota
- State Constitutional Law

Economics
- Principles of Accounting[1]
- Public Finance[1]
- State and Local Taxation[1]
- Public Utilities[1]
- Labor Problems
- Business Organization and Management
- Government and Business
- Transportation
- Statistics

Engineering
- Surveying[1]
- Highways and Pavements[1]
- Water Supply[1]
- Sanitary Engineering[1]
- Applied Electricity (51-52)
- Heat and Ventilation for Architects

Other courses
- General Bacteriology[1]
- Public Health[1]

Other electives
- Sociology
  - Introduction to Sociology
  - Housing Problems
  - Social Statistics and Survey

FIFTH YEAR

In this year the student will carry such courses as have not been completed in the preceding years and which seem in the opinion of his adviser to be necessary for the completion of his training. In addition to this he will conduct in the Twin Cities or vicinity a practical research in municipal government and administration, supplemented by work in the library and in the research bureau. The year will thus consist of about equal proportions of class work and research and reference bureau work. If desirable, the student will be allowed to take courses not mentioned above.

IX. PRE-BUSINESS COURSE

The pre-business course in the College of Science, Literature, and the Arts, required for admission to the School of Business, is made up as follows:

1. 10 credits in Economic History
2. 15 credits in English-Rhetoric
3. 10 credits in *one* of the following social sciences: anthropology, history, political science, sociology
4. 10 credits in mathematics or in *one* of the laboratory sciences: animal biology, botany, chemistry, physics
5. Four years of one language in preparatory school or 20 credits in one language in college, or the continuance of a language begun in preparatory school according to the following schedule:

Amount presented for entrance	*Amount required in the pre-business course*
4 years of one language	None
3 years of one language	5 credits in same language
2 years of one language	10 credits in same language
Less than 2 years of one language	20 credits in one language

[1] Required work.

6. 6 credits in psychology
7. 10 credits in the Principles of Economics
8. 8 credits in the Principles of Accounting
9. 5 credits in Business Organization
10. 5 credits in Statistics
11. A total of at least 90 credits and an average of one honor point per credit.

NOTE: Students preparing to follow lines of business relating to agriculture may substitute for items 1, 7, and 10 the equivalent courses in the Department of Agricultural Economics. In lieu of items 3 and 4, they are expected to take 5 credits in American Government, 20 credits in chemistry and animal biology or botany, and a minimum of 5 credits in technical agricultural courses.

X. GENERAL COURSE PRELIMINARY TO THE COLLEGE OF EDUCATION

The requirements for admission to the College of Education are identical with those for admission to the Senior College. All students who expect to receive the teacher's certificate from the University of Minnesota at the end of a four-year college course must register in the College of Education their junior year.

XI. GENERAL COURSE PRELIMINARY TO THE LAW SCHOOL

The requirements for admission to the Law School are identical with those for admission to the Senior College.

XII. THE PRE-DENTAL COURSE

This course consists of one year of prescribed work, during which the students are registered in this college and are subject to its regulations. The required courses are as follows:

Animal biology, three quarters (12 credits)
General Chemistry, two quarters (10 credits)
Qualitative Chemistry, one quarter (5 credits)
English, A-B-C (15 credits)
Shop practice in the engineering shops, three quarters (6 credits)

NOTE: This course assumes that pre-dental students enter with both high-school physics and high-school chemistry.

OTHER VOCATIONAL COURSES

For information and advice regarding the selection of studies in preparation for various vocations, the student should consult the heads of the departments concerned. The studies offered by the college are so varied and the opportunities for election are so great that the student who first forms an intelligent plan can usually find an excellent combination and sequence of courses serving his particular purpose. It is important in preparation for a vocation, not only to secure training in the major subjects, but also in the related subjects.

A considerable collection of literature and other information bearing upon the choice of a vocation and especially upon occupations open to women is available for the use of class officers and students.

COMBINED ARTS AND PROFESSIONAL COURSES

For the benefit of those who wish to begin a professional course before completing the four-year course in Science, Literature, and the Arts, the following combination courses and short courses are offered.

XIII. THE FIVE-YEAR COURSE IN ARTS AND CHEMISTRY

The degree of Bachelor of Arts is given at the end of the fourth year and the degree of Bachelor of Science in Chemistry at the end of the fifth year.

FRESHMAN, SOPHOMORE, AND JUNIOR YEARS

During the first three years of the course the student is registered in the College of Science, Literature, and the Arts, and is subject to its rules. He must complete the requirements of the Junior College and 45 credits in the Senior College, and must secure 135 honor points. This work must embrace the following subjects and their prerequisites:

Advanced Chemical German (German 28-29)
General Inorganic Chemistry and Qualitative Analysis
Quantitative Chemistry, two quarters
Physics with laboratory, one year
Technical Drawing, one year
Mathematics, 50 and 51

SENIOR YEAR

During his fourth year he must complete the work required in the junior year of the four-year course in Chemistry of the School of Chemistry and must maintain a standing equivalent to that required by this college for graduation.

The degree of Bachelor of Arts is voted by the College of Science, Literature, and the Arts at the end of the fourth year, and the student must present a total of not less than 180 credits and 180 honor points, including the required work mentioned above.

POST-SENIOR YEAR

The fifth year is the same as the fourth year of the four-year course in Chemistry, and upon its completion the student will be entitled to the degree of Bachelor of Science in Chemistry.

PROGRAM[1]

Freshman Year

Fall	Credits	Winter	Credits	Spring	Credits
Rhetoric-English	5	Rhetoric-English	5	Rhetoric-English	5
Chemistry	5	Chemistry	5	Chemistry	5
Mathematics	5	Mathematics	5	Mathematics	5

[1] For students entering with two years of high-school German. Students entering without either chemistry or German will require extra time to complete their work.

Sophomore Year

Fall	Credits	Winter	Credits	Spring	Credits
German	5	German	5	Social science	5
Physics	4	Physics	4	Physics	4
Chemistry	5	Chemistry	5	Chemistry	5
Drawing	2	Drawing	2	Drawing	2

Junior Year

	Credits		Credits		Credits
Mathematics	5	Mathematics	5	Chemistry	5
German	3	German	3	Electives	10 to 12
Social science	5	Chemistry	5		
Electives	3	Electives	3		

XIV. EIGHT-YEAR COURSE IN ARTS AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND DOCTOR OF MEDICINE

During the first three years of this course, the student does his work in the College of Science, Literature, and the Arts subject to the regulations governing other arts students, and must secure 135 credits including 22 credits in Senior College courses. The first year of the course in the Medical School counts as the equivalent of the fourth year (45 credits) of the arts course. During this year, the student must maintain a standing equivalent to that required by this college for graduation. During the four years the student must earn 180 honor points.

FRESHMAN AND SOPHOMORE YEARS

The following subjects must be included:

Rhetoric-English, 15 credits

Zoology, 12 credits

Qualitative Analysis, Quantitative Analysis,[1] and Medical Organic Chemistry, with the elementary courses prerequisite to them.

French or German sufficient to secure a reading knowledge.

Three quarters of work in physics (including laboratory) with prerequisite work in mathematics.

The following subjects are recommended as electives: economics, free-hand drawing, Latin, a fourth quarter of physics, psychology, and sociology.

JUNIOR YEAR

The work of the junior year is elective, subject to the requirement of 22 credits in Senior College courses.

SENIOR YEAR

This year is taken in the Medical School, and is counted toward the degree of Bachelor of Arts.

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[1] Quantitative analysis required in 1922; recommended for 1920-21.

XV. SEVEN-YEAR COURSE IN SCIENCE AND MEDICINE, LEADING TO THE DEGREES OF BACHELOR OF SCIENCE AND DOCTOR OF MEDICINE

To be eligible for admission to the Medical School, students in this course must secure in the College of Science, Literature, and the Arts not less than 90 credits and 90 honor points, and must complete the subjects prescribed above for the eight-year course in Arts and Medicine, substituting 9 credits in rhetoric for 15 credits in rhetoric-English.

The arrangement of the work is given below.

Ten credits must be selected from the social science group and psychology.

Three quarters of physics are required; a fourth quarter is strongly advised but the student may take an elective instead.

Students who enter with higher algebra elect trigonometry the first quarter.

Students must select such language work as will enable them to pass an examination demonstrating a reading knowledge of medical French or medical German before entering the Medical School. They may meet this requirement by passing two quarters' work in scientific French or scientific German, or by taking a special examination after completing 15 credits of French or two years of German. This examination is conducted by the department concerned.

Electives in the second year or summer quarter may be taken from any courses open to sophomore students in the College of Science, Literature, and the Arts.

A. FOR THOSE WHO ENTER WITH TWO YEARS OF EITHER FRENCH OR GERMAN

First Year

Fall	Credits	Winter	Credits	Spring	Credits
Chemistry	4	Chemistry	4	Chemistry	4
French	3	French	3	French	3
or		or		or	
German	4	German	3	German	3
Algebra or		Trigonometry	5		
Trigonometry	5	or		Physics	4
Zoology	4	Physics	4	Zoology	4
		Zoology	4		

Second Year

	Credits		Credits		Credits
Chemistry	4	Chemistry	4	Chemistry	4
Rhetoric	3	Rhetoric	3	Rhetoric	3
Physics	4	Physics	4		
		or		Elective	5
Elective	4-6	Elective	5	Elective	4-5
		Elective	4-5		

B. FOR THOSE WHO ENTER WITHOUT LANGUAGE AND WITHOUT HIGHER ALGEBRA

First Year

Fall	Credits	Winter	Credits	Spring	Credits
Chemistry	4	Chemistry	4	Chemistry	4
French	5	French	5	French	5
or		or		or	
German	5	German	5	German	5
Algebra	5	Trigonometry	5	Physics	4
Zoology	4	Zoology	4	Zoology	4

Summer Quarter

	Credits
Physics	4
Electives	10 to 12

Second Year

	Credits		Credits		Credits
Chemistry	4	Chemistry	4	Chemistry	4
German	5	French	3	French	3
or		or		or	
Elective	3 or 5	German	3	German	3
Physics	4	Physics	4	Electives	4 to 6
Rhetoric	3	or		Rhetoric	3
		Electives	4 to 6		
		Rhetoric	3		

JUNIOR AND SENIOR YEARS

The work during these two years is taken in the Medical School, and is credited toward the degree of Bachelor of Science. To secure this degree the student must have 180 credits and 180 honor points.

Students who have completed elsewhere two or more years of collegiate or university work which includes the required subjects specified above and which is in other respects the full equivalent of the two years of academic work required in the seven-year combined course, will be awarded the degree of Bachelor of Science on recommendation of the faculty of the College of Science, Literature, and the Arts, provided they meet the scholarship requirements stated above. The credit value of work done elsewhere shall be determined by the Students' Work Committee of the College of Science, Literature, and the Arts, but such credits shall not become effective until the student shall have completed, with the required standing, two full years of work in the Medical School of the University of Minnesota.

XVI. SIX-YEAR COURSE IN ARTS AND DENTISTRY, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND DOCTOR OF DENTAL SURGERY

During the first three years of this course the student does his work in the College of Science, Literature, and the Arts, subject to the regulations governing other Arts students and must secure 135 credits, including 22 credits in Senior College courses. The final year of the course in the College of Dentistry counts as the equivalent of the fourth year (45 credits) of the Arts course. During this year the student

must maintain a standing equivalent to that required by this college for graduation. During the four years the student must earn 180 honor points.

XVII. COMBINED ARTS AND NURSING COURSE

FRESHMAN YEAR

	Credits
Rhetoric-English	15
Foreign language	15
Chemistry	15
	45

SOPHOMORE YEAR

Fall	Credits	Winter	Credits	Spring	Credits
Psychology	3	Psychology	3	Psychology	3
History	5	History	5	Human physiology	5
Economics 3	5	Economics 4	5	Elem. bacteriology	5
Rhetoric 15	3	Rhetoric 15	3	Human anatomy	3
	16		16		16

THIRD YEAR—FALL QUARTER

	Credits
Elem. pharmacology	3
Bacteriology	4
Home economics	5
Sociology 1	5
	17

THIRD YEAR—WINTER QUARTER

Theoretical and practical work during this quarter includes lettering, history and ethics of nursing, hospital economy, personal hygiene, nursing practice, and practical dietetics.

During this quarter the student spends a portion of each day in the wards under supervision.

At the completion of this quarter's work, the student enters the junior class of the School of Nursing and continues her work in theory and practice with the students taking the three-year course.

FOURTH YEAR

Practical and theoretical work at hospital.

FIFTH YEAR

Two quarters in the hospital.

Two quarters in class work during which the student must elect courses carrying 25 credits in the College of Science, Literature, and the Arts, and must complete the requirements stated above for three years' work in this college.

XVIII. MILITARY SCIENCE AND TACTICS

REQUIRED WORK

All physically fit male students are required to take military training during the first two undergraduate years of their course unless they have

secured such training at an approved institution endorsed by the Military Department. When this course is entered upon it must be carried to completion as a prerequisite for graduation. No credits are allowed for this work.

All students, of any class, registered for military training, are members of the Reserve Officers' Training Corps, and as such are issued all necessary uniform clothing and equipment by the government free of charge.

After completing the two years required students may discontinue military work if they wish.

ELECTIVE WORK

Students who have completed the Basic Course, R.O.T.C., and are selected for advanced work by the professor of Military Science and Tactics, and who sign an agreement with the government to continue this work for the remainder of their college course (not to exceed two years) and to attend one summer training camp, are eligible for the Advanced Course, R.O.T.C., prescribed in Special Regulations No. 44, War Department, 1919.

The faculty will recommend for graduation any student who has satisfactorily completed the work of the Advanced Course, R.O.T.C., and has completed 174 college credits with 174 honor points, including all other specific requirements for graduation.

Students enrolled in the Advanced Course, R.O.T.C., are furnished with the necessary uniforms and equipment, and receive from the Government an allowance of forty cents per day while enrolled in this course, except during the period in which they are actually at a training camp.

All students who complete the Advanced Course, R.O.T.C., and who graduate from the University will, if recommended by the professor of military science and tactics and the president of the University, be commissioned in the Officers' Reserve Corps of the United States Army.

XIX. SIX-YEAR COURSE IN ARTS AND ARCHITECTURE

Preliminary announcement is made of a course designed to combine with the full technical course in Architecture the broad cultural training recognized as most desirable in preparation for the practice of this profession. The course will lead to the degree of Bachelor of Science at the end of four years, and to either Master of Science or an appropriate degree in architecture at the end of six years.

Students wishing to elect this course should consult the Department of Architecture. For the first two years the requirements will not differ materially from those laid down in the course in Architecture and Decoration on page 27 of this bulletin.

XX. SIX-YEAR COURSE IN ARTS AND LAW, LEADING TO THE DEGREES OF BACHELOR OF ARTS AND BACHELOR OF LAWS

The work of the first three years of this course is done in the College of Science, Literature, and the Arts and is subject to the regulations which govern the work of other Arts students. During these three years the student must secure not less than 135 credits, including 22 credits in Senior College courses. The first year of the course in the Law School counts as the equivalent of the fourth year (45 credits) of the Arts course. During this year the student must maintain a standing equivalent to that required by this college for graduation. During the four years the student must earn 180 honor points.

DEPARTMENTAL STATEMENTS

EXPLANATIONS

A dagger (†) indicates that all quarters of the course must be completed before credit is received for any quarter.

Course numbers.—Junior College courses (primarily for freshmen and sophomores) are numbered from 1 to 49. Senior College courses are numbered as follows: courses primarily for juniors and seniors, from 50 to 99; for juniors, seniors, and graduates, from 100 to 199; for graduates only, from 200 up. This system is not uniformly followed by departments in other colleges than Science, Literature, and the Arts.

ANIMAL BIOLOGY

Professors HENRY F. NACHTRIEB, Head; HAL DOWNEY, JOHN B. JOHNSTON, WILLIAM A. RILEY, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Associate Professor ELMER J. LUND; Assistant Professors ROYAL N. CHAPMAN, OSCAR W. OESTLUND; Instructors DWIGHT E. MINNICH, ADOLPH RINGOEN; Teaching Fellow GEORGE H. CHILDS; Assistants JOHN A. CEDERSTROM, MARION IRWIN, BRAND A. LEOPARD, LEWIS E. NELSON, EMILY H. PAYNE, EDNA M. WOLFE.

Major Advisers

Professors Nachtrieb, and Downey; Associate Professor Lund; Assistant Professor Chapman.

Major Sequences

A. In ecology, 109-110, 183; 117-118-119; 197-198-199. Prerequisites, 1-2, 37-38-39.)

B. In embryology, 181-182, 183; 197-198-199 or Mammalian Embryology and at least 9 additional credits in approved courses. (Prerequisite 1-2, 9-10, 23 or 47.)

C. In entomology, 125-126-127 or 139-140; 144-145-146 or 197-198-199; 197-198-199 or 9 more credits in approved courses. (Prerequisite 1-2, 37-38-39, 23 or 11 or 9-10.)

D. In physiology, 109-110, 183; 197-198-199. In addition the student should get 10 or 12 credits early in his course in one of the following: Physiological Chemistry 100-101-102, Physical Chemistry 140-141-142, Organic Chemistry 35-36, Physiology 103-104. (Prerequisite 1-2, 9-10, 43 or 47.)

E. In hematology, 109-110 or Human Physiology 103-104 or 181-182; 149-150-151; 153-154-155 or 197-198-199. (Prerequisite 1-2, 9-10, Anat. 5.)

NOTE: Any of the above sequences may be modified with the approval of the adviser, who will also suggest related courses offered in this and other departments.

Courses in human anatomy and Mammalian Embryology may be arranged for with the head of the Department of Anatomy.

Courses in human physiology may be arranged for with Dean Lyon.

COURSES

1-2†. General Zoology. A survey of the animal kingdom, emphasizing the principles of development and structure in relation to functions and habit, heredity and evolution, and the animals of economic importance. Lectures, quizzes, and laboratory. Sigerfoos, Ringoen, Minnich.

5-6-7†. General Zoology. Same as 1-2, for pre-medical students. Sigerfoos.

9-10. Histology. A comparative microscopic study of the origin and structure of the tissues of vertebrates and invertebrates, and of the organs of mammals. Textbook, lectures, and laboratory. Downey.

11. General Histology. A survey of the differentiation and specialization of the animal tissues and the construction of organs. Lectures, reference and laboratory work.

17-18. General Physiology. Physical and chemical properties of living protoplasm and cells. Various organisms which show to the best advantage the nature of physiological processes and introduce the student to quantitative experimental methods in biology. Laboratory, lectures, reading. Lund.

23. Morphogenesis and the Behavior of Organisms. Physiology of development of the egg. Regeneration. Production of heat, light, and electricity in animals. Comparative physiology of the nervous system, sense organs, and reactions in lower animals. Laboratory, lectures, and reading. Lund.

37-38-39. General Entomology. Elements of entomology leading up to discussion of the principles of taxonomy and their application to the classification of insects. Oestlund.

43. Introductory Entomology. The structure, development, and classification of insects. An introductory course in entomology and preparatory for courses in economic entomology. Oestlund.

44. Animal Parasites and Parasitism. An introductory course treating of the origin and biological significance of parasitism and of the structure, life history, and economic relations of parasites exclusive of the insects. Riley.

45-46. Ornithology. Study of the structure, classification, and habits of birds with special reference to birds of Minnesota. Considerable

time devoted to field study. Bird or field-glasses and handbook required. Laboratory, lectures, and quizzes. Class limited to ten. ROBERTS.

47. GENERAL ECOLOGY. A general course covering the relationships of animals, animal societies, and faunas to the inorganic and organic factors of the environment. The course consists of lectures, assigned reading, recitations, laboratory and field work. CHAPMAN.

75. NATURE STUDY. Discussions, references, field and laboratory work. Especially for the fitting of teachers in the secondary schools. SIGERFOOS.

102. MORPHOLOGY OF INVERTEBRATES. An intensive study of the crustacea and some of the smaller phyla of the animal kingdom. Mainly reference and laboratory work. SIGERFOOS.

107. PROTOZOOLOGY. Lectures, reference, and laboratory work on the structure and life histories of Protozoa, with special reference to the relation of the Protozoa to diseases of animals. SIGERFOOS.

109-110. GENERAL PHYSIOLOGY. A thoro survey of fundamental physiological processes in organisms. Based on Bayliss's *Principles of General Physiology*. Laboratory, lectures, and reading. LUND.

117-118-119. ECOLOGY OF INSECTS. General principles of ecology with special reference to the insects of Minnesota. Lectures, laboratory, assigned reading, and field work. CHAPMAN.

124. ADVANCED ECOLOGY. Similar to Course 117-118-119 with special field work. CHAPMAN.

125-126-127. ADVANCED ENTOMOLOGY. Advanced work in the lines of morphology and classification of insects, with lectures on the history of entomology. OESTLUND.

130. BIOLOGY AND TAXONOMY OF THE APHIDIDAE. Intensive study of the natural history, bibliography and classification of the Aphididae. OESTLUND.

139-140. HISTOLOGY AND DEVELOPMENT OF INSECTS. Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. RILEY.

144-145-146. ANIMAL PARASITES AND PARASITISM. Lectures and laboratory work. A consideration of the origin and biological significance of parasitism, and the structure, life history, and economic relations of representative parasites. The second half of the work will be devoted primarily to the relation of insects to diseases of man and animals. RILEY.

149-150-151. BLOOD OF VERTEBRATES. A comparative study of blood and blood-forming organs of vertebrates. A portion of time to be devoted to research. DOWNEY.

153-154-155. HEMATOLOGY. Primarily for medical students, but open to others with proper qualifications. Lectures and laboratory work on the blood and blood-forming organs of man and mammals. DOWNEY.

181-182. EMBRYOLOGY. A survey of the principles of animal development and a detailed study of the development of the circulatory or urinogenital system of a vertebrate. Lectures, reference and laboratory work. NACHTRIEB.

183. GENETICS AND EUGENICS. Facts and theories of heredity and the application of the laws governing natural inheritances for the improvement of the race. Lectures, references, quizzes, and demonstrations.

197-198-199. PROBLEMS. Advanced work in some special line. NACHTRIEB, DOWNEY, JOHNSTON, RILEY, SIGERFOOS, LUND, CHAPMAN, OESTLUND.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

COURSES

The courses in this department are closely correlated with those of the Department of Animal Biology. Courses 37-38-39, 44, 117-118-119, 125-126-127, 130, 139-140, 144-145-146 are offered under these numbers in both departments. In addition the following courses in entomology and economic zoology are available:

1. INTRODUCTORY ENTOMOLOGY. Lectures and laboratory work on the characteristics and habits of insects. OESTLUND, RILEY.

2. ECONOMIC ENTOMOLOGY. The life histories, habits, and methods of control of the insect pests of orchard, field, and garden. Laboratory work in the determination of the more important forms. RUGGLES.

3. ELEMENTARY ECONOMIC ENTOMOLOGY. A brief course dealing with the characteristics and habits of insect pests and beneficial insects and methods of control. Not open to students planning to specialize in entomology. GRAHAM.

4. ECONOMIC VERTEBRATE ZOOLOGY. Relation of birds and wild animals to agriculture. Lectures, laboratory, and field work. Identification and study of Minnesota birds and wild animals affecting the horticulturist and agriculturist, methods of combating injurious and conserving useful forms. WASHBURN.

12. FOREST ZOOLOGY. Forest animals. Relation of birds and of various four-footed animals to forest protection. Habits, range, usefulness; the manner of protecting the important large and small game, fish, and birds; fish culture. WASHBURN.

16. PLANT PEST CONTROL. The theory and practice of control of insect and fungous pests of crop plants. Practical applications. Not open to those who have completed Plant Pathology 14. Same as Plant Pathology 6. STAKMAN, BISBY, RUGGLES.

150. INSECTICIDES AND THEIR ACTION. A study of the chemical composition, the physical properties, and the physiological action of standard, of little-known, and of new insecticides. MOORE.

197. INTRODUCTION TO RESEARCH. Preparation for investigational work in lines of entomology, parasitology, or economic zoology. Advanced laboratory, field, and library work; training in the preparation of bibliographies and manuscripts; special problems. Summer work should be planned when possible. OESTLUND, systematic entomology; RUGGLES, general economic entomology; CHAPMAN, insect ecology; MOORE, insecticides; RILEY, parasitology; insect morphology; WASHBURN, economic vertebrate zoology.

ANTHROPOLOGY AND AMERICANIZATION TRAINING

Professor ALBERT ERNEST JENKS, Chairman; Assistant Professor OSCAR W. JUNEK; Instructors RUTH M. LINDQUIST (Home Economics), MARGARET K. MUMFORD (Home Economics); Assistant Instructor ALONZO G. GRACE.

COURSES

1. INTRODUCTION TO ANTHROPOLOGY. Origin and development of mankind; activities, organization, and institutions of society; determinants of social types; the bearing of anthropology and sociology on present-day problems and thought. JENKS, JUNEK, GRACE.

2. GENERAL ANTHROPOLOGY. Theories, facts, and factors in the origin and distribution of human races. Early world migrations. Important anthropological problems. JENKS, GRACE.

4. CULTURAL ANTHROPOLOGY. Origin and early development of the most important activities and institutions which had their beginning among primitive man. (Not offered in 1920-21.) JENKS.

5. GENERAL IMMIGRATION. Facts of recent world migrations. Chief causes of emigration from old nests, and of immigration to the United States; federal and state problems of immigrant legislation, control, and distribution. JUNEK, GRACE.

12. ETHNOLOGY. The different so-called races of men; their historical classifications; determinance of ethnic types; important ethnic problems. JENKS.

57-58-59. RACE LEADERS AND PROGRAMS. Studies of racial or national leaders. Preparation of programs, in English, from racial data as means of contact for mutual understanding between Americans and various racial groups in America.

60. SLAVIC CULTURE. The basic Slavic institutions. Characteristics of Slavic culture. JUNEK.

61-62.[1] SLAVIC ORAL LANGUAGE. Slavic linguistic families. A speaking knowledge of a Slavic language is taught, illustrating the methods and technique of teaching our language to adult foreigners in America. JUNEK.

70. FOOD PREPARATION IN RELATION TO SOCIAL WORK. A study of the principles underlying cookery with special emphasis on the preparation of foods to be used in homes with limited incomes. LINDQUIST.

71. ELEMENTARY DIETETICS FOR THE SOCIAL WORKER. Involves principles underlying adequate feeding. Food habits of different economic and racial groups forming the basis for actual planning and preparation of meals. MUMFORD.

72. HOME MANAGEMENT PROBLEMS. Involves the making of sound budgets. Studies are based upon racial groups and the size of the family, together with the income. LINDQUIST.

108. PHILIPPINE PEOPLES. Comparative study of the four large ethnic and cultural groups of people in the Philippine Islands; policy of the insular government as it affects American home interests in the Orient. (Not offered in 1920-21.) JENKS.

110. PHYSICAL ANTHROPOLOGY AND AMALGAMATION. Theory of evolution as applied to natural and cultural man. Eugenics in theory, law, and practice. Studies in the amalgamation of races. (Not offered in 1920-21.) JENKS.

112. THE AMERICAN NEGRO. Development of the American Negro; his characteristics, conditions, and developing tendencies, Negro and immigrant adjustments. (Not offered in 1920-21.) JENKS.

113. THE OLDER IMMIGRANTS. Characteristics, contributions, and distribution of the older immigrant peoples in America; their modification and importance to us. JENKS.

114. THE NEWER IMMIGRANTS. Characteristics, contributions, and distribution of the newer immigrant peoples in America; their modification and importance to us. JENKS.

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[1] Open only to students who are specializing in americanization work.

115. AMERICANISMS AND ASSIMILATION. Essential and unique historical americanisms, and their value and virility for the future in America. Conditions and facts of assimilation. JENKS.

117. THE IMMIGRANT WOMAN. The peculiar problems of the woman immigrant in personal service, in industrial groups, in the home, and out of regular employment. (Not offered in 1920-21.)

118. GOVERNMENT AND THE IMMIGRANT. Legal and administrative aspects of americanization. Federal and state laws affecting immigration, citizenship, and naturalization; practical administration of these laws through governmental agencies; political experiences of the foreign-born. (Not offered in 1920-21.)

123-124. PROBLEMS IN ANTHROPOLOGY. An advanced course of method and independent research. JENKS.

128. TECHNIQUE OF TEACHING ADULTS. Technique of teaching adults—the foreign-speaking, the illiterate, the fatigued—in keeping with the dignity of mature years, and the mental processes of mature minds of foreigners. JUNEK.

129. METHODS OF AMERICANIZATION. Practical methods of americanization in use in the United States, together with facts and conditions of their success and failure. JENKS, JUNEK.

130. ORGANIZATION OF AMERICANIZATION WORK. Existing americanization organizations of federal, state, municipal, and neighborhood groups. Methods of organizing new groups, and of interorganic coöperation. JENKS, JUNEK.

131-132-133. SUPERVISED AMERICANIZATION WORK. Practical field work among foreign peoples in our vicinity. JUNEK.

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

Professors FREDERICK M. MANN, Chairman; LEON ARNAL; Assistant Professors SAMUEL C. BURTON, JAMES H. FORSYTHE, ROY C. JONES; Special Lecturer ARTHUR R. NICHOLS; Instructor GEORGE H. PRUDDEN.

NOTE: All courses open to students in the course in Architecture and Decoration are open to all juniors and seniors who have the prerequisites.

COURSES

4-5-6†. ELEMENTS OF ARCHITECTURE. Beginning study for students in the Science, Literature, and the Arts course in Architecture and Decoration with addition of instrumental and freehand drawings. BURTON, FORSYTHE, PRUDDEN.

10-11-12†. FREEHAND DRAWING. Drawing with charcoal, pencil, pen and ink, and color from architectural ornament and details of the figure; drawing from memory. The course is arranged to give an appreciation of balance in light and shade. BURTON.

15-16-17†. ARCHITECTURAL DESIGN. Original problems dealing in general with elements of elevation and their composition into simple architectural units. Sketch problems dealing with elementary plan compositions. Individual criticism and library research. JONES.

21-22-23†. SPECIFICATIONS AND WORKING DRAWINGS. Preparation of plans and detailed working drawings of small frame and small masonry buildings. Specifications, measured drawings of important details of construction. Written reports from buildings under construction. JONES.

51-52-53†. FREEHAND DRAWING. Drawing from the antique in charcoal, pen and ink, pastel, and pencil. Painting from still life in oils and water-color. Study of the elementary principles of composition and of color arrangement. BURTON.

55-56-57†. ARCHITECTURAL DESIGN. INTERMEDIATE. Original problems dealing in buildings. Sketch problems dealing with plain composition. Individual and general criticism and library research. ARNAL.

61-62-63†. FREEHAND DRAWING. Drawing and painting from the antique and from life; figure composition. Study of draperies in preparation for work in decoration, figure composition; and of the application of the figure to mural decoration. Modeling in clay. BURTON.

65-66. MATERIALS OF CONSTRUCTION. The properties and processes of manufacture of building materials, and their uses in construction. MANN.

71-72-73†. ARCHITECTURAL DESIGN. Original problems dealing with composition of single buildings or groups of buildings and those of special character. Subjects of decorative or imaginative interest. Sketch problems. JONES.

81. BUSINESS PRACTICE. Relations of the architect, owner, and builder; forms of contracts, professional ethics, and office administration. MANN.

82. LANDSCAPE DESIGN. Theory and practice of landscape design. Lectures and design problems. NICHOLS.

83. DECORATION AND THE ALLIED ARTS. Color theory. History of decoration and ornament, furniture, weaving, glass-making, etc. MANN.

85. ARCHITECTURAL HISTORY. Technical study of the architecture of ancient Egypt, Assyria, Persia, and Greece, with emphasis on the latter. Study of political, social, and economic conditions affecting

the architecture of this period. Illustrated lectures and library research. FORSYTHE.

86. ARCHITECTURAL HISTORY. Technical study of the architecture of ancient Rome and of the Renaissance in Italy to the end of the fifteenth century. Study of political, social, and economic conditions. Illustrated lectures and library research. FORSYTHE.

87. ARCHITECTURAL HISTORY. Technical study of the architecture of the Renaissance of the sixteenth and seventeenth centuries in Italy. Technical study of the architecture of the Renaissance in Spain. Illustrated lectures and library research. FORSYTHE.

88. ARCHITECTURAL HISTORY. Technical study of the architecture of the Middle Ages in Italy, France, and England; sources and influences in the development of the Romanesque and Gothic styles, particularly in France. Lectures and library research. MANN.

89. ARCHITECTURAL HISTORY. Technical study of developed Gothic architecture in France and England. Early Renaissance architecture in France and England, its sources and affecting influences. Lectures and library research. MANN.

90. ARCHITECTURAL HISTORY. Technical study of the development of architecture from the seventeenth century to and including the present time, particularly in France, England, and America. Lectures and library research. MANN.

91. HISTORY OF SCULPTURE AND PAINTING. Historical study of ancient, Renaissance, and modern sculpture and of the Renaissance and modern schools of painting. BURTON.

ASTRONOMY

Professor FRANCIS P. LEAVENWORTH, Head; Assistant Astronomer WILLIAM O. BEAL.

Major Adviser

Professor Leavenworth.

Major Sequence

Courses 51-52-53, 101-102-103, and Mathematics 50, 51, 52.

COURSES

4-5. INTRODUCTION TO ASTRONOMY.[1] Lectures and recitations on the elements of astronomy. Illustrated by lantern slides, simple apparatus, equipment at observatory, diagrams, and telescopic observations. Questions, exercises, problems, and naked-eye observations are assigned. LEAVENWORTH, BEAL.

[1] This course will satisfy the Junior College requirement for science (new curriculum).

7. NAVIGATION. A study of the principles of piloting, dead reckoning, nautical astronomy, rules of the road, etc. This course prepares men for positions as ensigns and as officers in the merchant marine. LEAVENWORTH.

11.[1] DESCRIPTIVE ASTRONOMY. Lectures and recitations on the general principles and fundamental facts of astronomy, with particular emphasis on the solar system. Illustrated by lantern slides, simple problems, naked-eye and telescopic observations. LEAVENWORTH, BEAL.

25.[1] STELLAR ASTRONOMY. Review of present state of knowledge concerning the stars. Positions, proper motions, parallaxes, spectra, radial velocities, group and stream motions, brightness, color, and temperatures of the stars. Binaries. Variables. Clusters. Nebulae. Theories of stellar evolution. LEAVENWORTH, BEAL.

51-52-53. GENERAL ASTRONOMY. A thoro study of the general principles of astronomy, illustrated by lantern slides, simple, problems, and telescopic observations. LEAVENWORTH, BEAL.

62. ELEMENTS OF PRACTICAL ASTRONOMY. Theory and use of astronomical instruments in determining time, latitude, longitude, azimuth, and positions of heavenly bodies. BEAL.

101-102-103. PRACTICAL ASTRONOMY. Theory and use of astronomical instruments in determining time, latitude, longitude, positions of heavenly bodies; astronomical photography, with measures of plates; study of the method of least squares. LEAVENWORTH.

140. METHOD OF LEAST SQUARES. The combination and adjustment of observations and the discussion of their precision as applied especially to engineering, physics, astronomy, and psychology. LEAVENWORTH.

111-112-113. CELESTIAL MECHANICS. Analytical study of the motion of two bodies. General view of the theory of perturbations. BEAL.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

Professor WINFORD P. LARSON, Chairman; Associate Professor ARTHUR T. HENRICI; Instructor ANNE BENTON; Assistant ROBERT G. GREEN.

Major Advisers

Professor Larson; Associate Professor Henrici.

Major Sequences

Sequence A. For work in medical or public health bacteriology. Courses 101, 114, 116, 117, 119, 120, 150, 151. (Prerequisites: besides the

[1] This course does not satisfy the Junior College requirement for science (new curriculum).

necessary courses in this department, Animal Biology 44 and 107 and Physiology 100-101 or Biochemistry 111-112.)

Sequence B. For work in industrial bacteriology. Courses 103, 105, 114, 118, 119, 120, 150, 151. (Prerequisites: besides the necessary courses in this department, Physiology 100-101 or Biochemistry 111-112.)

COURSES

1. General Bacteriology. The preparation of culture media; the morphology of bacteria; methods of staining and identification; anaerobic bacteria; principles of sterilization and disinfection; examination of air, water, milk; relation of bacteriology to the industries.
Special division for medical students: Larson and Assistants.
Special division for dental students: Henrici and Assistants.
Divisions for other students: Benton and Assistants.

101. Special Bacteriology for Medical Students. The study of pathogenic bacteria, especially in relation to definite diseases; bacteriological methods in clinical diagnosis; principles of infection and immunity, with practical application of serum reactions. Larson and Assistants.

103. Special Bacteriology for Students of Agriculture. Bacteriology of the soil in relation to fertility; the nitrogen-fixing bacteria of legumes; bacteria that cause plant diseases; bacterial diseases of domestic animals; the bacteriology of milk and dairying. Henrici and Assistants.

105. Household Bacteriology. The decay, fermentation, and putrefaction of foodstuffs; molds; canning; bacterial food poisoning; bacteriology of the cleansing processes. Benton.

114. The Higher Bacteria. Study of morphology, cultivation and classification of actinomycetes, yeasts, and molds. Study of the mycoses. Henrici.

116. Course in Immunity. Laws of hemolysis. Quantitative relationship between antigen and antibody. Wassermann reaction. Opsonins. Vaccines. Precipitin reaction. Blood grouping. Abderhalden reaction. Anaphylaxis. Larson.

117. Pathogenic Protozoa. Study of parasitic protozoa of man, including spirochaets; their morphology and life histories; intermediate hosts as agents in the spread of disease; cultural methods. Larson.

118. Morphology and Taxonomy of Bacteria. Cytology of bacteria; their origin and systematic position; consideration of morphological, biochemical, and immunological characters as data for classification; variations and mutations in bacteria; the biometrical method as applied to bacteriology. Henrici.

119. BACTERIOLOGICAL CHEMISTRY. Chemical analyses of bacteria; physical agents influencing bacterial metabolism (salinity, hydrogen-ion concentration, surface tension, etc.); factors stimulating enzyme production; protein, carbohydrate, and fat metabolism of bacteria; nitrogen fixation. GREEN and Assistants.

120. BACTERIOLOGICAL CHEMISTRY. Continuation of 119. Bacterial toxins; "split proteins"; bacterial activity in the alimentary tract; pigment production; autolysis of bacteria; immuno-chemistry; permeability of bacterial cells; behavior of bacteria toward electricity. GREEN and Assistants.

150-151. ADVANCED BACTERIOLOGY. An advanced course giving additional work in bacteriology and the opportunity of working out special problems. LARSON, HENRICI.

BOTANY

Professors CARL O. ROSENDAHL, Chairman; ELIAS J. DURAND, LEE I. KNIGHT, JOSEPHINE E. TILDEN; Associate Professor FREDERICK K. BUTTERS; Assistant Professors WILLIAM S. COOPER, NED L. HUFF; Instructor ARTHUR M. JOHNSON.

Major Advisers

Professors Rosendahl and Knight; Associate Professor Butters.

Major Sequences

Sequence A. In morphology of algae. Courses 52, 54, 62, 63, 105, and any one of 123, 124, 125, and 126. (Prerequisites: 1-2 and 7.)

Sequence B. In morphology of land plants. Courses 52, 54, 62, 63, and ten credits from 107, 108, and 110. (Prerequisites: 1-2 and 7.)

Sequence C. In morphology of fungi. Courses 52, 54, 62, 63, 105-106-107 in the Department of Botany and Plant Pathology. (Prerequisites: 1-2 and 7.)

Sequence D. In taxonomy. Courses 52, 54, 62, 63, 110, 113-114-115. (Prerequisites: 1-2 and 7.)

Sequence E. In physiology. Courses 52, 53 or 63, 54, 141; Chemistry 35-36. (Prerequisites: 15 credits of botany; Chemistry 6-7-8 or its equivalent.)

Sequence F. In ecology. Courses 52, 54, 113-114-115, and 10 credits from 131, 132, and 133. (Prerequisites: 1-2 and 7, and Geology 1-2 or 29.)

Sequence G. In cytology. Courses 51, 52, 54, 62, 63, 118-119. (Prerequisites: 1-2, 7, and 15.)

COURSES

1-2†.[1] GENERAL BOTANY. Principles of subject. Survey of organs of flowering plant followed by study of internal structure and physiology.

[1] Students entering college with a year of high-school botany satisfactory to the department may be admitted directly into Course 2. All such must present to the department before registration, their high-school notebook and a statement from their teacher showing the amount and proficiency of their work.

Representatives of algae, fungi, liverworts, mosses, gymnosperms, and angiosperms examined with reference to tracing evolution of vegetable kingdom. DURAND, BUTTERS, HUFF, and Assistants.

7. TAXONOMY OF FLOWERING PLANTS. A general study of the classification and relationships of flowering plants. Laboratory and field practice in the determination of species, together with lectures and quizzes. ROSENDAHL.

11. GENERAL MORPHOLOGY OF ALGAE AND FUNGI. A general survey of the structure, evolution, and classification of the algae and fungi. Lecture, laboratory, and field work. TILDEN.

15. ANATOMY OF VASCULAR PLANTS. A study of the miscroscopic structure of vascular plants, the cell, tissues, and tissue systems with particular attention to the development and evolution of the vascular system in the root, stem, and leaf. BUTTERS.

51. HISTOLOGICAL METHODS. Training in methods used in the preparation and preservation of class material. Special attention is given to methods of killing, imbedding, sectioning, staining, and mounting. DURAND.

52. PLANT PHYSIOLOGY. An introductory course giving a general survey of plant functions. KNIGHT.

53. BOTANY OF ECONOMIC PLANTS. A survey course treating the most important botanical features of the common economic plants. KNIGHT.

54. ELEMENTARY ECOLOGY. An introduction to the study of plants and their environment; investigation of the habitat; its effects upon plants as individuals and in mass; plant communities; plant successions. Laboratory and field work, lectures, and discussions. COOPER.

62. GENERAL MORPHOLOGY OF BRYOPHYTES AND PTERIDOPHYTES. A general survey of the structure, evolution, and classification of the liverworts, mosses, and ferns. HUFF.

63. GENERAL MORPHOLOGY OF GYMNOSPERMS AND ANGIOSPERMS. A general survey of the structure, evolution, and classification of seed plants. BUTTERS.

105. ALGAE. A study of freshwater forms, based on collections made by the class. Lectures, laboratory, and field work. TILDEN.

107. MORPHOLOGY AND TAXONOMY OF THE BRYOPHYTES. A special study of the structure and classification of the liverworts and mosses. (Not given in 1920-21.) DURAND.

108. MORPHOLOGY AND TAXONOMY OF THE PTERIDOPHYTES. An intensive study of lycopods, ferns, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. BUTTERS.

110. MORPHOLOGY AND TAXONOMY OF THE GYMNOSPERMS. An intensive study of cycads, conifers, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. (Not given in 1920-21.) BUTTERS.

113-114-115. ADVANCED TAXONOMY. An advanced course in which special attention is given to the taxonomy of difficult natural groups, involving systematic principles and practice, rules of nomenclature, systems of classification, etc. ROSENDAHL.

118-119. CYTOLOGY. A survey of cell structure and the various phenomena of division, fusion, and metamorphosis, together with a review of the history of cytological investigation. Methods of cytological research indicated in the laboratory. ROSENDAHL.

123. MORPHOLOGY AND TAXONOMY OF THE ALGAE: BLUE-GREEN. Advanced studies in selected groups of the blue-green algae. Lectures, reports, discussions of current literature, and laboratory work. TILDEN.

124. MORPHOLOGY AND TAXONOMY OF THE ALGAE: GREEN. Advanced studies in selected groups of the green algae. Lectures, reports, discussions of current literature, and laboratory work. TILDEN.

125. MORPHOLOGY AND TAXONOMY OF THE ALGAE: BROWN. Advanced studies in selected groups of the brown algae. Lectures, reports, discussions of current literature, and laboratory work. TILDEN.

126. MORPHOLOGY AND TAXONOMY OF THE ALGAE: RED. Advanced studies in selected groups of the red algae. Lectures, reports, discussions of current literature, and laboratory work. TILDEN.

131. FIELD ECOLOGY. A careful study of the local plant communities and successions, followed by written report, and by a study of the general principles of plant association and succession. COOPER.

132. ECOLOGICAL ANATOMY. The individual plant and its parts as related to environment: greenhouse and microscopic study of special plant forms and structures, their causes and significance. COOPER.

133. FOREST GEOGRAPHY OF NORTH AMERICA. Principles of plant distribution discussed, followed by detailed study of forest regions of North America, through reading, discussion, lantern slides, distribution maps, microscopic work, written reports. Should be preceded by Field Ecology, but not necessarily. COOPER.

ADVANCED PLANT PHYSIOLOGY

141. PHYSICAL PHASES OF PLANT PHYSIOLOGY. A course dealing with the intake of materials and their translocation, also the energy relations of the plant. KNIGHT.

142. PLANT METABOLISM. A course dealing with the synthesis of plant food, its transformation and utilization by the plant. KNIGHT.

143. PLANT METABOLISM AND GROWTH. Continuation of Course 142, also introducing certain fundamental phases of growth. KNIGHT.

PLANT PATHOLOGY AND BOTANY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Professors EDWARD M. FREEMAN, Chairman; ELVIN C. STAKMAN; Instructors ROBERT C. DAHLBERG, ALVIN H. LARSON.

GENERAL STATEMENT

For specialization in this department, see special requirements in Course of Study.

INTRODUCTORY COURSES

1. PLANT PATHOLOGY. Elementary study of plant diseases due to fungi, bacteria, and slime molds; life histories and preventive methods. Lectures, laboratory, and reference. Not open to those who have completed 10. FREEMAN, STAKMAN.

6. PLANT PEST CONTROL. The theory and practice of control of insect and fungous pests of crop plants. Practical applications. Same as Entomology 16. Not open to those who have completed 14. STAKMAN.

7-8. WEEDS AND GRASSES. Agricultural and applied botanical study of weeds and grasses with special reference to agricultural importance. DAHLBERG.

9. WEEDS AND SEED-TESTING. Detailed study of seed-testing methods and seed legislation. Weed and crop seeds and weed plants studied with special reference to identification. DAHLBERG, LARSON.

10. FOREST PATHOLOGY. Elementary study of plant diseases due to fungi, bacteria, and slime molds; life histories and preventive methods. Lectures, laboratory, and reference. Not open to those who have completed 1. Offered in alternate years. FREEMAN, STAKMAN.

12. SEED PROBLEMS. Special seed problems are assigned. Advanced work in seed-testing methods. DAHLBERG.

14. PLANT DISEASE CONTROL. A detailed study of methods of controlling diseases of plants of parasitic origin. Spray materials and spray machinery. Practical applications. Not open to those who have completed 6.

ADVANCED COURSES

105-106-107. MYCOLOGY. A general study of the morphology, taxonomy, and biology of fungi. Lectures, laboratory, greenhouse, and field work. FREEMAN, STAKMAN.

108-109. METHODS. Plant pathological methods including mycological and bacteriological technique. Laboratory, lecture, and greenhouse work. Special problems. STAKMAN.

110. PRINCIPLES OF PATHOLOGY. Comparative biology of plant pathogens; pathological plant anatomy; parasitism, biologic specialization, resistance, and immunity. Will be given in close coöperation with Division of Agricultural Biochemistry and divisions offering work in plant-breeding. STAKMAN.

111. DISEASES OF FIELD CROPS. Detailed study of diseases of cereal and forage crops, including symptomology, etiology, and practical methods of control. Laboratory, lecture, and field work. BARKER, STAKMAN.

112. DISEASES OF FRUIT AND VEGETABLE CROPS. Special study of diseases of fruit and vegetable crops, especially those important in Minnesota. Laboratory, lecture, and greenhouse work.

CHEMISTRY

SCHOOL OF CHEMISTRY

Professors LAUDER W. JONES,[1] GEORGE B. FRANKFORTER, CHARLES F. SIDENER; Associate Professors WILLIAM H. HUNTER, FRANK H. MACDOUGALL, M. CANNON SNEED; Assistant Professors LILLIAN COHEN, ISAAC W. GEIGER, LAWRENCE M. HENDERSON; Instructors LLOYD H. REYERSON, GUY H. WOOLLETT.

Major Advisers

Associate Professors Hunter and Sneed.

Major Sequence

Courses 20-21, 35-36, 140-141, and any one of 102, 103, 123, 124, 131, 137, 142. (Prerequisites: 6-7-8 or 9-10, 11, and 12.)

COURSES

DIVISION OF GENERAL AND INORGANIC CHEMISTRY

1-2-3†. GENERAL INORGANIC CHEMISTRY. (For pre-medical students.) For those who have had no high-school chemistry. Study of the general laws of chemistry and of the non-metals and their compounds. 2. Continuation of Course 1. 3. Study of the metals and their compounds. Continuation of Course 2.

[1] Resigned, June 30, 1920.

4-5†. General Inorganic Chemistry. (For pre-medical students.) For those who have had one year of high-school chemistry. Study of general laws of chemistry and of non-metals and their compounds. More intensive than Courses 1 and 2. 5. Study of metals and their compounds. Continuation of Course 4. For pre-medical and pre-dental students only.

6-7-8†. General Inorganic Chemistry. For those who have had no high-school chemistry. Includes study of general laws of chemistry and non-metals and their compounds. 7. Continuation of Course 6. 8. Metals and their compounds and ionic equilibrium, considered quantitatively. Cohen and Assistants.

9-10†. General Inorganic Chemistry. For those who have had one year of high-school chemistry. General laws of chemistry; non-metals and their compounds. More intensive than Courses 6 and 7. 10. Metals and their compounds and ionic equilibrium, considered quantitatively. Sneed and Assistants.

11. Qualitative Chemical Analysis. (For pre-medical students.) Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry.

12-13†. Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry. 13. Continuation of Course 12.

101. History of Chemistry. The historical development of the theories of chemistry from the period of the ancients to the present time is covered by this course, particular emphasis being given to modern theories and laws. Cohen.

102. Advanced Qualitative Analysis. This course includes an analysis of minerals, alloys, paints, and the methods of detecting some of the rarer elements.

103. Advanced Inorganic Chemistry. A discussion of special subjects of inorganic chemistry such as valency, oxidation and reduction, complex ions, etc. Sneed.

104. Advanced Inorganic Chemistry. A discussion of the chemistry of certain elements and compounds such as cobalt, silver, mercury, tungsten, and their derivatives.

DIVISION OF ANALYTICAL CHEMISTRY

20. QUANTITATIVE ANALYSIS. An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. SIDENER, GEIGER, and Assistants.

21. QUANTITATIVE ANALYSIS. Supplementary to Course 20. Further discussion of the principles and methods together with laboratory work on additional typical problems in gravimetric and volumetric analysis. SIDENER, GEIGER, and Assistants.

123. IRON AND STEEL ANALYSIS. Rapid technical methods for determination of the common constituents of iron ore, iron, and steel will be discussed and compared, and typical problems assigned for laboratory practice. One lecture and eight laboratory hours per week. SIDENER, GEIGER.

124. MINERAL AND ORE ANALYSIS. A course in the rapid technical methods for the determination of important constituents in minerals, ores, and slags. One lecture and eight laboratory hours per week. SIDENER, GEIGER.

125. SPECIAL PROBLEMS IN QUANTITATIVE ANALYSIS. Selection may be made to meet the particular needs of the student from the following: silicate analysis, non-ferrous alloy analysis, industrial water analysis, problems in electro-analysis, etc. Six or nine laboratory hours per week. SIDENER, GEIGER.

126. SANITARY WATER ANALYSIS. Lectures and laboratory practice in the chemical examination of potable waters. Three or six hours laboratory work per week. SIDENER, GEIGER.

DIVISION OF ORGANIC CHEMISTRY

31-32†. ELEMENTARY ORGANIC CHEMISTRY. This course will include a discussion of important compounds of the aliphatic and of the aromatic series, and the preparation of typical substances. It is intended primarily for students in professional schools. HUNTER, WOOLLETT, and Assistants.

35-36†. ORGANIC CHEMISTRY. An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. HUNTER, WOOLLETT, and Assistants.

131. ADVANCED ORGANIC CHEMISTRY. Aliphatic and aromatic series. HUNTER and others.

132. ADVANCED ORGANIC CHEMISTRY. Heterocyclic compounds. HUNTER and others.

137-138. ADVANCED ORGANIC CHEMISTRY LABORATORY WORK. Includes difficult preparations and problems. Intended to supplement the student's knowledge of the methods of organic chemistry, and is recommended to all students who expect to pursue research in organic chemistry. HUNTER and others.

139. ADVANCED ORGANIC CHEMISTRY LABORATORY WORK. This is a course of selected laboratory problems of an advanced nature including some original work in the nature of an introduction to research.

DIVISION OF PHYSICAL CHEMISTRY

140-141-142. PHYSICAL CHEMISTRY. A general survey of the subject. Three lectures and one recitation. Laboratory work three or six hours per week. Three, four, or five credits, depending on amount of laboratory work. MACDOUGALL and Assistant.

143-144-145. THERMODYNAMICS AND CHEMISTRY. A detailed study of the principles of thermodynamics and their application to physical and chemical phenomena. (Not offered in 1920-21.) MACDOUGALL.

146-147-148. KINETIC THEORY AND ATOMISTICS. This course proposes to study chemical phenomena from the atomistic or molecular point of view and will therefore take up the kinetic theory of gases and liquids, the kinetic interpretation of chemical equilibrium, reaction velocity, catalysis, structure of the atom, etc. MACDOUGALL.

149. PRINCIPLES OF COLLOIDAL CHEMISTRY. REYERSON.

150. APPLICATION OF COLLOIDAL CHEMISTRY. (Not offered in 1920-21.) REYERSON.

151. RADIOCHEMISTRY. The occurrence, methods of isolation, and physical chemical properties of the radioactive substances, together with a brief consideration of the chemical, geological, and biological bearing of the subject. HENDERSON.

152. LABORATORY COURSE IN RADIOCHEMISTRY. To accompany Course 151. HENDERSON.

153-154-155. ADVANCED PHYSICAL CHEMISTRY LABORATORY. To accompany or follow any of the advanced courses in physical chemistry. MACDOUGALL.

159-160. PHYSICAL CHEMISTRY SEMINAR. One hour a week. For students taking advanced courses in physical chemistry. MACDOUGALL, HENDERSON, REYERSON.

AGRICULTURAL BIOCHEMISTRY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Professors ROSS A. GORTNER, CLYDE H. BAILEY; Associate Professors LEROY S. PALMER, R. ADAMS DUTCHER; Assistant Professors CLARENCE A. MORROW, JOHN J. WILLAMAN, GEORGE E. HOLM.

INTRODUCTORY COURSES

7-8. GENERAL AGRICULTURAL BIOCHEMISTRY. A lecture and laboratory course involving a qualitative and quantitative study of the types of

organic and inorganic compounds found in plants and animals and of the chemical changes involved in metabolism, growth, and maintenance. DUTCHER.

15. PRINCIPLES OF ANIMAL NUTRITION. A course consisting of lectures, recitations, and collateral reading emphasizing the chemical and physiological principles underlying digestion, metabolism, utilization of feeds, maintenance, growth, fattening, milk production, vitamine hypothesis, and deficiency diseases. DUTCHER.

ADVANCED COURSES

101-102. AGRICULTURAL QUANTITATIVE ANALYSIS. The estimation of inorganic and organic constituents of biological products, the proximate analysis of foods and feeding stuffs, the use of the polariscope, immersion refractometer, colorimeter and nephelometer, viscosimeter, and other special apparatus. MORROW.

103. DAIRY CHEMISTRY. Lectures, library, and laboratory work involving a study of the chemical composition of dairy products and the quantitative analysis of these products as practiced in control laboratories, together with qualitative examination for preservatives and adulterations. PALMER.

108. CHEMISTRY OF WHEAT AND WHEAT PRODUCTS. A lecture course, with collateral library reference work, on the chemical technology of the production and milling of wheat and the conversion of its products into human food. BAILEY.

110. FLOUR LABORATORY METHODS. A laboratory course in methods of analyses of wheat and its products; milling tests of wheat, baking, and special tests of flour. Designed to train students for research and control work in the cereal industry. BAILEY.

111-112. PHYTOCHEMISTRY. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes and pigments and their physico-chemical relations to the vital processes involved in growth and nutrition. MORROW.

113-114. BIOCHEMICAL LABORATORY METHODS. A laboratory course paralleling the lectures in 111, using recent methods for the investigation of biologically important compounds, with especial reference to the detection and estimation of such compounds in cells or tissues. MORROW, SHARP.

116. CHEMISTRY OF "VITAMINES" AND DEFICIENCY DISEASES. Lectures, consultations, and library work on special nutritional problems accompanied by chemical and biological studies of food materials from the standpoint of the "vitamine" content. DUTCHER.

118. LABORATORY PROBLEMS IN BIOCHEMISTRY. Special laboratory work in the preparation or isolation of pure compounds which occur in living cells, in the study of biochemical reactions, or in special methods of identification or determination of biochemical products. GORTNER, BAILEY, DUTCHER, PALMER, MORROW, WILLAMAN, HOLM.

COMPARATIVE PHILOLOGY

Professor FREDERICK KLAEBER, Head; Assistant Professor SAMUEL KROESCH (German).

COURSES

101-102†. GENERAL INTRODUCTION TO THE SCIENCE OF LANGUAGE. Prerequisites, one of the following groups: (1) five years foreign language, four may be in high school and one in college; (2) two years foreign language in college; (3) four credits Old English. KLAEBER.

103. UNIVERSAL LANGUAGE. Comparison of families of languages grammatically and lexically. Movement for creation of an international language. Consideration of Volapük, Esperanto, Ido, etc. KLAEBER.

105. THE LIFE OF WORDS. Etymology and semasiology. Growth of vocabulary; change of words in form and meaning. KLAEBER.

108. COMPARATIVE PHONETICS. A study of speech sounds and the nature of their production with special reference to English, French, and German. Open to students of the modern languages. Prerequisite, two credits in starred courses. Identical with German 108. KROESCH.

109-110-111†. HISTORY OF THE GERMAN LANGUAGE. Lectures, discussions, assigned readings. Prerequisites, German 66-67. This course is identical with German 109-110-111. KLAEBER.

141-142-143†. HISTORICAL GRAMMAR OF THE ENGLISH LANGUAGE. I. Sounds and spelling. II. Accidence and syntax. (Not given in 1920-21.)

DRAWING AND DESCRIPTIVE GEOMETRY

COLLEGE OF ENGINEERING AND ARCHITECTURE

Professor WILLIAM H. KIRCHNER, Chairman; Instructors LEON ARCHIBALD, JOHN O. CEDERBERG, ROBERT F. SCHUCK.

COURSES

41-42-43. TECHNICAL DRAWING. A general course in the theory and practice of drawing. Sketching, lettering, tracing, blue-printing, and mechanical drawing. The use of instruments, projections (constructive geometry), and working drawings. KIRCHNER and Assistants.

44-45-46. DRAWING AND TRACING. Intensive course on instruments, elementary projection, lettering, drafting-room methods and conventions, including tracing and blue-printing. Primarily designed to meet the demand of the industries. KIRCHNER and Assistants.

ECONOMICS

SCHOOL OF BUSINESS[1]

Professors GEORGE W. DOWRIE, JOHN D. BLACK, ROY G. BLAKEY, WILLIAM W. CUMBERLAND, NORMAN S. B. GRAS, JOHN H. GRAY, JEREMIAH S. YOUNG (Political Science); Associate Professors FREDERICK B. GARVER, ALVIN H. HANSEN, BRUCE D. MUDGETT; Assistant Professors Z. CLARK DICKINSON, CLARENCE L. HOLMES, ALBERT C. JAMES, ERNEST A. HEILMAN, HOWARD S. NOBLE, THOMAS H. SANDERS, J. WARREN STEHMAN, HOLBROOK WORKING; Professorial Lecturer J. FRANKLIN EBERSOLE; Instructors HILDING E. ANDERSON, CLYDE R. CHAMBERS, JOSEPH E. CUMMINGS, VICTOR H. PELZ; Assistant HAROLD R. KING.

Major Adviser

Associate Professor Garver.

Major Sequence

In the junior year, Courses 54, 143-144, 161; in the senior year, 72 or 154, 103-104, 191-192. (Prerequisite: 1-2 and 3-4.)

COURSES

1-2†. INTRODUCTION TO ECONOMIC HISTORY WITH SPECIAL EMPHASIS ON THE UNITED STATES. Lectures and section work. A general survey of the development of agriculture, manufacture, transportation, storage, and exchange of goods; economic crises; land, capital, management, and labor; the interplay of economic and political forces. GRAS, MUDGETT, DICKINSON.

3-4†. PRINCIPLES OF ECONOMICS. Principles that underlie the present industrial order. Application of principles to economic problems such as labor, insurance, finance, transportation, industrial combination, government control. HANSEN, JAMES, and others.

6.[1] AGRICULTURAL ECONOMICS. The special body of economic principles that have been developed for agricultural production, exchange, and distribution, together with the application of these principles to agricultural problems. HOLMES, WORKING.

7.[1] PRINCIPLES OF ECONOMICS. (Home Economics.) The principles of economics with more than the usual emphasis upon consumption. CHAMBERS.

13.[1] AGRICULTURAL STATISTICS. Statistical method applied to agricultural data. BLACK.

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[1] Given at University Farm.

14. ELEMENTS OF STATISTICS. Elementary principles of classification, analysis, and presentation of statistical materials, with primary emphasis on economic data. Lectures, readings, and laboratory work. MUDGETT.

18.[1] PROBLEMS IN AGRICULTURAL ECONOMICS. Application of the principles of agricultural economics to a number of the major agricultural problems. Each student partly chooses his own study problems. HOLMES.

20-21.[1] ECONOMIC HISTORY AND GEOGRAPHY OF AGRICULTURE. (1) The evolution of modern agricultural production, tenure systems and market distribution; (2) the forces determining past and present localization of agricultural products, types of agricultural production and agricultural markets. HOLMES, CHAMBERS.

23. PRINCIPLES OF ORGANIZATION AND MANAGEMENT. Types of operating organization; specialization; coördination of men and departments; planning; delegation of authority; means of control; establishment and maintenance of standards for materials, operation, machinery; determination of business policies; personnel problems. PELZ.

25-26†. PRINCIPLES OF ACCOUNTING. Purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts and other statements; introduction to partnership and corporation accounts. A laboratory course with supplementary lectures. HEILMAN, NOBLE and others.

41. FINANCIAL HISTORY OF THE UNITED STATES. A study of the development of the main features of our systems of money, banking, tariffs, and public finance including a consideration of war financiering and financial cycles. BLAKEY.

51-52-53†. BUSINESS LAW. Principles governing ordinary business transactions. Contracts—formation, operation, interpretation, breach, and discharge. Agency and service. Negotiable instruments. Business associations—partnerships and private corporation. Property—personal and real. YOUNG.

54. CORPORATION FINANCE. The organizing, financing, and managing of corporations. A study of corporate securities for purposes of promotion and reorganization and of facilities for marketing them. STEHMAN.

59. LIFE INSURANCE. Life insurance companies; types of policies and their uses; premiums, reserve, surrender values, dividends, and rights and obligations of the policy holder. Brief discussion of accident and health insurance. JAMES.

[1] Given at University Farm.

60. FIRE INSURANCE. Basic theory and critical examination of the fire insurance policy. Study of organization of stock and mutual companies, agency system; reserves, rate-making and fire prevention. Special attention to laws of Minnesota. JAMES.

61. PROPERTY INSURANCE. A study of basic principles and critical analysis of marine insurance, plate-glass window, burglary, credit, boiler, and factory mutuals. (Not given in 1920-21.) JAMES.

62. SOCIAL INSURANCE. Discussion of wage earners' problem in securing adequate insurance protection. Analysis of industrial and group insurance, pensions, old age, sickness, and unemployment insurance. Study of state insurance funds in United States. JAMES.

72. ECONOMICS OF TRANSPORTATION. The theory and practice of rate-making. Government regulation, the conflict between state and federal authorities, and suggested improvements in control of transportation agencies. CUMMINGS.

74. WATER TRANSPORTATION. History and present status of inland waterway and ocean transportation in the United States with some reference to present development in representative foreign countries. Problems peculiar to water transportation in the United States. CUMMINGS.

85-86†. MARKETING OF MANUFACTURED PRODUCTS. Organization of distributive channels; marketing of basic raw materials and manufactured products; relations, selling problems and methods of manufacturers, wholesalers, retailers, and other factors in the distributive system; price policies; price maintenance. PELZ.

89.[1] MARKETING OF AGRICULTURAL PRODUCTS. Study of the principles relating to the distribution of farm products; types of markets, middlemen, market organizations; costs; prices; coöperative marketing. ANDERSON.

103-104†. VALUE AND DISTRIBUTION. An advanced course in economic theory devoted chiefly to the study of recent theories of wages, interest, rent, and profits. Assigned readings and reports on current problems in distribution. GARVER.

105. HISTORY OF ECONOMIC IDEAS. History of economic thought; scope and logical methods, relation to other social sciences; methods of investigation and instruction. Assigned readings, reports, and class discussion. GARVER.

107.[2] LAND ECONOMICS. A study of several problems arising out of the land basis of civilization, such as property in land, land utilization, land classification, land settlement, status of the agricultural classes, farm labor, farm ownership and tenancy. BLACK.

[1] Section on each campus.
[2] Given at University Farm.

108.[1] FARM MARKETING PROBLEMS. Studies of the problems and methods of marketing selected farm products with special reference to the Twin City markets. BLACK, ANDERSON.

109.[1] ECONOMICS OF CONSUMPTION. Nature of human wants; standards of living; cost of living, income, administration of income; nature of demand; demand and price; relation of consumption and the population problem. BLACK.

110-111.[1] PRACTICE COURSE IN MARKETING. Eight to twelve weeks of experience as an employee in central or local markets. Careful study and observation of methods. Written plans and reports. BLACK, ANDERSON.

112-113†. TECHNIQUE OF STATISTICAL INVESTIGATION. Primary and secondary investigations; statistical units, preparation, filling, and editing of schedules; classification and tabulation of returns; presentation of results. Readings, field work, and reports. MUDGETT.

116.[1] ECONOMICS OF AGRICULTURAL PRODUCTION. Detailed analysis of the economic principles underlying agricultural production; economic characteristics and functions of the factors of production; proper combinations of factors; selection of enterprises. HOLMES.

117.[1] PRICES OF FARM PRODUCTS. Price determination in the various markets for various classes of farm products; analysis of forces determining prices. WORKING.

118-119-120†. ECONOMIC HISTORY OF EUROPE AND THE UNITED STATES, 1750 TO THE PRESENT. Graduates taking the course will be required to do some special work. GRAS.

121-122-123†. ECONOMIC HISTORY OF EUROPE, 1300-1750. The chief interests are the manor; the town; the metropolis; national economic regulations; developments in agriculture, commerce, manufacture, and economic thought, leading up to the industrial revolution. (Not given in 1920-21.) GRAS.

126-127-128†.[1] SPECIAL RESEARCH PROBLEMS IN AGRICULTURAL ECONOMICS. Intensive individual research work on problems not being studied in the seminar during the quarter. BLACK, HOLMES, WORKING.

143-144†. MONEY AND BANKING. Relation to industrial system. Monetary principles with special reference to United States. American banking and bank organization, principles of commercial banking, non-commercial banking, relation of government to banking, comparative study of leading foreign systems. DOWRIE, EBERSOLE, STEHMAN.

146. INVESTMENTS. Sources of demand and supply of capital; bond houses and stock exchanges as marketing media, criteria for personal selection

[1] Given at University Farm.

of prime investments; government, municipal, corporation and real estate loans; and the use of bond tables. EBERSOLE.

149. BUSINESS CYCLES. American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression, and financial panics. Critical examination of all the available business barometers designed to forecast similar conditions. EBERSOLE.

153. THE MODERN BUSINESS CORPORATION. Social and legal aspects of the corporation. The development of the trust and the regulatory policy of the government. GRAY.

154. PUBLIC UTILITIES. Economic and legal bases of classification. Relative advantages of public ownership and regulation. Central and municipal regulation compared. The basis of rates; relative rates; rates and service. Summary of the theories of valuation. GRAY.

155-156†. VALUATION. The instructor will direct investigation on special topics, emphasis on public service industries. Physical property, intangibles; original cost, investment, unearned increment, surplus, gifts, price levels, appreciation, depreciation. Value for expropriation, taxation. Capitalization, rate-making. GRAY.

157. POLICE POWER. Nature of police power; constitutional aspects of social and economic legislation, including safety, order, morals, and protection against business fraud and oppression; the fundamental rights under the police power. (Not given in 1920-21.) YOUNG.

158. GOVERNMENT AND BUSINESS. Protection against fraud and oppression; restraint of trade and manipulation of prices; protection of debtors; business affected with a public interest; compulsory benefits; conservation of natural wealth; vested rights; confiscatory legislation; reaction of war emergency measures on permanent policy. YOUNG.

160. ECONOMIC MOTIVES. Psychological approach to certain problems of economic theory, e.g., analysis of wants and consumption, "desire for wealth," valuation, pecuniary and other motives of producers—savers, inventors, entrepreneurs, laborers. Possibilities of redirecting motives. DICKINSON.

161. LABOR PROBLEMS AND TRADE UNIONISM. Origin of the labor problem; conditions of labor in American industries; structure, aims, policies, and methods of trade and industrial unionism and employers' associations; collective bargaining and shop committees; mediation and arbitration; injunctions; labor legislation. HANSEN.

162. THE LABOR MOVEMENT IN AMERICA. The conditions, class alignments, and philosophies underlying American labor movements from 1820 to 1920; the historical development of various labor organizations, labor parties, and labor programs; the single-tax movement; reconstruction proposals. HANSEN.

167. INDUSTRIAL RELATIONS. Broader problems of labor policy, from standpoint of management. Wage systems, labor cost, profit-sharing; scientific management and labor; collective bargaining, works councils or shop committees, their relations to trades unions. Studies of practice, and written report by student. DICKINSON.

169. THE LABOR AND SOCIALIST MOVEMENT IN EUROPE. A theoretical analysis and historical survey of utopian socialism, Marxian socialism, evolutionary socialism, anarchism, syndicalism, sovietism, guild socialism, state socialism, coöperation, and labor parties especially as found in Germany, France, England, and Russia. HANSEN.

175. LAW OF LABOR. See Political Science.

176. COMMERCIAL POLICIES. Theory of international commerce; free trade, reciprocity, protection, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign politics, and other governmental and organized efforts to affect trade. American problems emphasized. BLAKEY.

191-192†. PUBLIC FINANCE. National government revenues, expenditures, and debts. This includes a study of the principles and various forms of taxation, budgetary legislation and control, war and emergency financiering, the shifting and incidence of taxes and fiscal reforms. BLAKEY.

193. STATE AND LOCAL TAXATION. Principles and problems, e.g., state and local taxation of lands, mineral resources, forests, corporations, incomes, inheritances; also studies of classification, separation, local option, exemption, double taxation, evasion, assessment, centralized administration. BLAKEY.

EDUCATION

COLLEGE OF EDUCATION

DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND SUPERVISION

Professors LOTUS D. COFFMAN,[1] LEONARD V. KOOS, FLETCHER H. SWIFT; Assistant Professor ROSS L. FINNEY.

COURSES

3. EDUCATIONAL SOCIOLOGY. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations.

5. PUBLIC EDUCATION IN THE UNITED STATES. A brief survey of the factors determining the problem of public education in America, followed by a brief account of the development and organization of typical state school systems.

[1] Resigned, July 1, 1920.

119-120. School Curricula. Study of the ideas implicit in a democratic society and an attempt to apply those ideas in the selection of material of school curricula. Involves some consideration of the constructive aims and methods of education. (Not given in 1920-21.)

124-125-126. Educational Administration. An interpretation of present tendencies in the administration of state and city school systems.

164. Problems of High-School Administration. A study of the types of secondary schools, units of administration, costs, forms of organization, graduation requirements, and extra-curricular activities.

167. Junior High School. The history of the junior high-school movement, its purposes and results, changes in curriculum and in methods of instruction, special groups appealed to, modifications in plant and equipment.

167-168. Junior High School. A four-credit course identical with 167.

DEPARTMENT OF HISTORY AND PHILOSOPHY OF EDUCATION

Professors Fletcher H. Swift, David P. Swenson (Philosophy); Instructor Jean H. Alexander.

1. Brief Course in History of Education. Current school problems and educational theories in the light of their history. Emphasis upon secondary education and those aspects of education of most immediate concern to high-school teachers.

101. Foundations of Modern Education. Historical analysis and interpretation of the more important elements in modern education derived from the Hebrews, Greeks, Romans, Middle Ages, and Renaissance.

102. History of Modern Secondary and Higher Education. A survey of existing types of American and European secondary and higher schools, followed by a historical study of their origin, aims, growth.

103. History of Modern Elementary Education. The institutions, theories, and problems of modern elementary education in the light of their history. Emphasis upon the rise of state systems and upon the history of modern educational reform.

114. Philosophy of Education. A discussion of philosophically formulated ideals of education with an attempt to reach a positive philosophy of educational values. Swenson.

129-130. Educational Classics. An intensive study of selected writings of educational leaders: first quarter, Plato, Aristotle, Quintilian, Comenius, Locke; second quarter, Rousseau, Pestalozzi, Herbart, Froebel, and Dewey. Students may register for either quarter.

131-132. Comparative School Systems. A survey of the existing school systems of France, England, Germany, Denmark. Emphasis upon

present problems. Special reference to educational conditions in the United States. Students may register for either quarter.

146. History and Principles of Religious Education. Influence of religion and religious education as social and spiritual forces among certain selected types. Principles of education as applied to religious instruction and training. (Not given in 1920-21.)

148. History of Education in the United States. Evolution of American ideals, institutions, and practices in elementary and secondary education. Emphasis upon movements of the early nineteenth century. Development of state school systems and the rise of the high school.

ENGLISH, RHETORIC, AND PUBLIC SPEAKING

Chairman for English, Carleton Brown; Chairman for Rhetoric and Public Speaking, Joseph M. Thomas.

Professors Carleton Brown, Richard Burton, Frederick Klaeber, Elmer E. Stoll, Joseph M. Thomas; Associate Professors Joseph W. Beach, Cecil A. Moore, Frank M. Rarig; Assistant Professors Daniel Ford, James T. Hillhouse, Charles W. Nichols, Anna H. Phelan, Martin B. Ruud, Instructors Richard Atwater, Cecil C. Bean, Mary Ellen Chase, Elbridge Colby, Lewis B. Hessler, Kenneth Hunter, Sigurd B. Hustvedt, Elizabeth Jackson, Frances Kelley, Charles F. Lindsley, Ariel Macnaughton, Marjorie Nicolson, Roscoe E. Parker, Stanley Rypins, Emerson G. Sutcliffe, Howard T. Viets; Assistant Dorothy Hudson.

ENGLISH

Major Advisers

Professors Brown and Stoll; Associate Professor Moore.

Major Sequences

A. Medieval. Courses 51 or 136; 145 or 146-147 or 101; 103; 140; 109-110 or 105-106 or 107-108; 141-142-143 or German 100-101-102 or Latin 123 and 121. (Prerequisites, Courses 4, 6, 8.)

B. Renaissance. Courses 136, 62; 152 or 51; 111-112 or 53 and 64; 109-110 or 107-108 or 133 or 146-147; French 150-151-152 or 121-122-123 or Italian 159-160-161 or Latin 121 and 132. (Prerequisites, Courses 6, 8.)

C. Drama. Courses 62 or 133; 136; 129; 152 or 70; 123-124-125 or Public Speaking 91-92-93 or Rhetoric 115-116-117; French 150-151-152 or German 123-124-125; Spanish 150-151-152. (Prerequisites, Courses 6, 8.)

D. Poetry. Courses 62; 51 or 53 or Rhetoric 100-101; 150-151; 136 or 140 or 133; 105-106 or 109-110 or 111-112 or 107-108 or 109-110; 146-147 or Italian 159-160-161 or 153-154-155 or French 153-154-155 or German 160-161-162. (Prerequisites, Courses 6, 8.)

E. Prose. Courses (1 out of 3) 66, 155, 64; (2 out of 4) 109-110, 107-108, 111-112, 123-124-125; (1 out of 6) 51, 62, 151, 150, 105-106, 109-110; Rhetoric 103-104-105 or Rhetoric 107 and Rhetoric 109-110 or Rhetoric 111-112-113. (Prerequisites, Courses 6, 8.)

COURSES

A-B-C. FRESHMAN ENGLISH. The study of the fundamental principles of composition; training in the art of writing; an historical survey of the classics of English literature. THOMAS, director of the course.

1-2-3. GENERAL SURVEY OF ENGLISH LITERATURE. Lectures, recitations and assigned readings. Designed to prepare for more minute study of special periods.

4. OLD ENGLISH. The language, with reading of representative selections of Old English prose and poetry. The relation to modern English is particularly emphasized. RUUD.

6. CHAUCER. Reading of tales from the Canterbury collection, with introduction dealing with the grammar and literary forms of fourteenth-century English. BROWN.

8. SHAKESPEARE. An introductory study of Shakespeare's development as a poet and dramatist up to *King Lear*, with reading of representative plays. First quarter, STOLL; second quarter, STOLL; third quarter, HILLHOUSE.

27. HISTORY OF THE ENGLISH LANGUAGE. Outlines of the history of the language. Lectures and assigned readings. KLAEBER.

40. THE BIBLE AS LITERATURE. A literary study of the Old Testament with special attention to forms and the critical study of selected readings. (Not given in 1920-21.) BURTON.

41. BROWNING AND TENNYSON. A reading of the representative work of the two major poets of the Victorian era, in order to show their quality and contrasted power. BURTON.

44-45. AMERICAN LITERATURE. Lectures on American literature, with extensive readings from the principal poets and prose writers of the United States. MOORE.

51. SPENSER. The forms and literary influences in the Elizabethan period illustrated in the poetry of Edmund Spenser, with brief readings from the minor poems and extended study of *The Faerie Queene*. (Not given in 1920-21.) STOLL.

53. SEVENTEENTH-CENTURY LYRISTS. The tradition of the Elizabethan lyric traced in the work of the metaphysical and cavalier schools of poetry. (Not given in 1920-21.)

58-59. NINETEENTH-CENTURY PROSE. Studies in the more important prose writers of the nineteenth century, with reference to their styles, personalities, opinions, and relations to their period. Readings by students, and essays on approved topics. (Not given in 1920-21.) BEACH.

62. MILTON. A special study of Milton, with some consideration of his contemporaries. STOLL.

64. BACON. A study of Bacon as an essayist and as a promoter of learning. (Not given in 1920-21.)

66. THE ENGLISH NOVEL. Principles and personalities in the evolution of the English novel. Written reports on selected novels. BURTON.

70. MASTERPIECES OF ELIZABETHAN DRAMA. A study of Elizabethan dramatic art aside from Shakespeare's. Less attention will be paid to historical development than in Course 225-226-227 and more to the analysis of the art of the chief writers—Marlowe, Johnson, Beaumont and Fletcher, Webster, and Massinger. STOLL.

101. INTRODUCTION TO MIDDLE ENGLISH. An outline of Middle English grammar, including the interpretation of selected texts. KLAEBER.

103. BEOWULF. An introduction to the Old English poem, with reading of considerable portions of the text. KLAEBER.

105-106. EIGHTEENTH-CENTURY POETRY. The rise of naturalism and romanticism. Eighteenth-century poetry from Pope to Burns, with special reference to the rise and growth of naturalism and romanticism. (Not given in 1920-21.) MOORE.

107-108. EIGHTEENTH-CENTURY PROSE. Lectures on eighteenth-century prose and prose writers; readings by the students and essays on approved topics; special study of fiction and the essay. MOORE.

109-110. THE ROMANTIC POETS OF THE NINETEENTH CENTURY. The Romantic school of poets from Wordsworth to Keats and the influence of the French revolution. BEACH.

111-112. SEVENTEENTH-CENTURY PROSE. General survey of the prose of the century to 1660. Course 3-4 in History is a desirable prerequisite. (Not given in 1920-21.)

123-124-125. STUDIES IN VICTORIAN NOVELISTS. George Meredith; or, in alternate years, Thomas Hardy and Henry James. Hardy and James in 1920-21. BEACH.

129. MODERN DRAMA. Contemporary drama from 1870 to the present; the new impulse in dramatic literature under the stimulus of latter-day thought. BURTON.

131. FORMAL SATIRE. A detailed examination of non-dramatic satire in poetry and prose from the Restoration to the death of Pope, with special emphasis upon Butler, Dryden, Swift, and Pope. MOORE.

133. THE ENGLISH AND SCOTTISH POPULAR BALLADS. A study of a large number of traditional ballads, English and foreign, and a study of ballad style and origins. STOLL.

136. ADVANCED SHAKESPEARE. Shakespeare's development traced to the end. A careful analysis of four plays. Problems in the interpretation of Shakespeare's dramatic methods. STOLL.

140. ADVANCED CHAUCER. A study of the more important of Chaucer's poems aside from *The Canterbury Tales,* with consideration of critical problems relating to the sources and chronology of Chaucer's work. BROWN.

141-142-143. HISTORICAL GRAMMAR OF THE ENGLISH LANGUAGE. This course is identical with Comparative Philology 141-142-143. (Not given in 1920-21.) KLABER.

145. MEDIEVAL ALLEGORY. A general introduction to the allegory as a type of literature, with special consideration of the more important examples, both religious and secular, in Middle English. BROWN.

146-147. THE METRICAL ROMANCES. A study of the more important Middle English romances; designed as an introduction to the great stories of love and chivalry current in the Middle Ages, particularly those connected with Arthur and the Round Table. (Not given in 1920-21.) BROWN.

150. VICTORIAN POETRY. The poetry of the Victorian era, aside from Browning's and Tennyson's. The principal names are: Matthew Arnold, the Rossettis, Fitzgerald, and Swinburne. STOLL.

151. RECENT POETRY. Poetry in England and America since the death of Queen Victoria. The main tradition and tendencies now prevailing. (Not given in 1920-21.) BEACH.

152. PRE-ELIZABETHAN DRAMA. A study of the late medieval and the Renaissance drama, moralities, interludes, and farces up through the earlier years of the Elizabethan period. BROWN.

155. THE AMERICAN NOVEL. A study in the beginnings of the American novel and short-story and their development to about 1865. Among the writers included are Charles Brockden Brown, Irving, Cooper, Poe, Hawthorne, Thomas Bailey Aldrich. MOORE.

RHETORIC

Major Advisers

Professor Thomas; Assistant Professor Ford.

Major Sequence

Courses 119-120-121, and 6 credits from English 58-59, 107-108, 111-112 in addition to one of the following five groups of courses:

a. Courses 100-101, and English 51 or 53 or 150 or 151 or 109-110.

b. Courses 103-104-105 and English 58-59 or 107-108 or 111-112.

c. Courses 107, and 109-110, and English 58-59 or 107-108 or 111-112.

d. Courses 111-112-113 and English 58-59 or 107-108 or 111-112.

e. Courses 115-116-117 and English 129, and either English 136 or Public Speaking 91-92-93.

(Prerequisites, 11-12-13 or 15-16-17.)

COURSES

A-B-C. FRESHMAN ENGLISH. The study of the fundamental principles of composition; training in the art of writing; an historical survey of the classics of English literature. THOMAS, director of the course.

4-5-6. COMPOSITION FOR TECHNICAL STUDENTS. Required in the College of Engineering, the School of Chemistry, in the seven-year course in Science and Medicine in the College of Science, Literature, and the Arts, and in the course in Art Education in the College of Education. Practical training in the art of writing; the principles of structure, and analysis of specimens of good prose.

11-12-13. EXPOSITION, DESCRIPTION, AND NARRATION. Principles and practice; analysis of specimens; short themes and fortnightly essays, with emphasis on planning and amplification; description, the first quarter; narration, the second; and literary criticism, the third. Number in each section limited to twenty. HILLHOUSE, PHELAN, RUUD.

15-16-17. EXPOSITION AND ARGUMENT. Exposition during the first quarter, followed by argument. The study of a text and the analysis of specimens, accompanied by weekly essays, and shorter themes. Number in each section limited to twenty. FORD.

31. TECHNICAL WRITING. See program for College of Engineering.

100-101. VERSIFICATION. The nature of poetry and a detailed analysis of English meters and the various English verse forms. The theory accompanied by criticism of current poetry and practice in writing verse. NICHOLS.

103-104-105. STUDIES IN STRUCTURE AND STYLE. Theory of structure and style; rhetorical analysis of standard English prose; themes based on personal observation, current readings, and investigation; preparation of essays with particular classes of readers in view. FORD.

107. IMITATIVE WRITING. The principles of structure, diction, and style, which underlie the work of leading English writers; application of these principles in both imitative and original composition.

109-110. SHORT-STORY WRITING. The technique of the short story accompanied by constructive work in story-writing.

111-112-113. ESSAY-WRITING. Practice in writing didactic, biographical, critical, informal essays. Extended composition. Individual aid in gathering of material, planning of papers, and criticism of essays. Analysis of a considerable body of modern essays. SUTCLIFFE.

115-116-117. DRAMATIC TECHNIQUE. Principles of plotting, characterization, climax, dialog, and scenario-making. Writing of three plays—two original, one dramatized short story. Required readings, laboratory work, criticisms of local productions.

119-120-121. SEMINAR IN WRITING. Open to advanced students who write with facility and who desire personal direction. Criticism of manuscripts submitted. Lectures on fundamental principles of English composition. THOMAS.

PUBLIC SPEAKING

Major Adviser

Associate Professor Rarig.

Major Sequences

Either of groups a and b and either of groups c and d.

a. Courses 55-56-57 and Economics 176 or 118-119-120 or 105 or History 107-108 or Political Science 125 or Political Science 131-132.

b. Courses 85-86-87 and Philosophy 124-125 or Sociology 108 or 120 or Philosophy 105.

c. Courses 81-82-83 and Philosophy 55.

d. Courses 91-92-93 and English 129 or 136 and Architecture 83 and Physical Education for Women 19-20-21.

Honorable Mention in Public Speaking.—Students who have won honors in debate or oratory, if the department deems them worthy, may receive honorable mention on the commencement program. To be eligible for such distinction a student must (1) have represented his class in the freshman-sophomore debate, or won a place in the freshman-sophomore oratorical contest; (2) have taken part in an intersociety debate; (3) have represented the University in an intercollegiate debate, or won a place in the Pillsbury oratorical contest.

COURSES

41-42-43. A GENERAL COURSE IN PUBLIC SPEAKING. Fundamentals of effective speaking; breathing, voice-production, enunciation, and action; delivery of extracts from the works of well-known writers and speakers; principles underlying speech-making applied in both oral and written composition. Each section limited to twenty-five. RARIG, LINDSLEY.

45-46. A General Course in Public Speaking. A five-credit course identical in subject-matter with 41-42-43.

55-56-57. Argumentation and Debating. Analysis, gathering of evidence, briefing. Critical study of models, including Lincoln-Douglas debates. Principles governing persuasive speaking applied in practice debates. Students in extension debating must register for this course to get credit for their work. Lindsley.

81-82-83. Interpretative Reading. The interpretation and expression of the various forms of literature, such as the essay, the short story, lyric and narrative poetry, and the drama. Rarig.

85-86-87. Advanced Public Speaking. The distinctive characteristics of oratorical style; analysis of the styles of representative orators. Written and extemporaneous speeches. Individual criticism and direction. Those desiring to prepare for the Pillsbury contest should register for this course. Rarig.

91-92-93. Play Production. Principles and practice of play production; studies of the various aspects, such as the reading of lines, characterization, action, and stage business, settings, and lighting; the coaching of plays. Macnaughton.

97. Intercollegiate Debate and Oratory. The question for intercollegiate debate studied and briefed, and frequent practice debates held. Rarig, Lindsley.

GEOLOGY AND MINERALOGY

Professors William H. Emmons, Chairman; Clinton R. Stauffer, Frank F. Grout; Assistant Professors Chessley J. Posey, A. Walfred Johnston,[1] Thomas M. Broderick; Instructors George M. Schwartz, Arthur J. Tieje.

Major Advisers

Professors Emmons (economic geology), Stauffer (general geology and paleontology), and Grout (mineralogy and petrography).

Major Sequences

Sequence A. For general geologist, federal and state surveys, etc. Courses 51-52, 57-58-59, 105, 144-145 or 124-125, 85.

Sequence B. For petroleum geologist. Courses 91-92-93 or 57-58-59, 101, 105, 111-112, 137, 144-145 or 124-125.

Sequence C. For mining geologist and mineralographer. Courses 51-52, 101, 111-112-113, 137, 124-125 or 144-145, 85, 166.

[1] On leave of absence 1920-21.

Sequence D. For paleontologist. Courses 57-58-59, 107-108-109, 150, 151-152-153.

Sequence E. For mineral statistician and geographer. Courses 51-52, 114, 105, 111-112, 116, 117. Economics 14.

Sequence F. For foreign trade service. Course 114, 116, 117, 118 or 119. Economics 176, 143-144. Political Science 121-122. Courses 114, 51-52, 54, 67 and 6 additional credits as approved by the major adviser.

Sequence G. For mineralogist. Courses 61, 105-106, 111-112, 131, 137, 166-167, 85 or 150.

Sequence H. For Petrographer. Courses 105-106, 111-112 or 124-125, 131-132-133, 140-141, 85 or 150.

COURSES

1-2†.[1] GENERAL GEOLOGY. Open to those who have had some course in chemistry. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours. EMMONS, TIEJE.

4. GEOLOGY OF MINNESOTA. The physical geography and geologic history of Minnesota. The relations of industrial development to geological features, the principles of pre-Cambrian geology as exemplified in Minnesota. (Not offered in 1920-21.) JOHNSTON.

7-8. GENERAL GEOLOGY LABORATORY. Supplements Course 1-2 with study of rocks and ores, topographic and geologic maps, fossils, and reference reading.

11-12†.[2] INTRODUCTION TO GEOLOGY. No prerequisites. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours. TIEJE.

15. MINERALS AND ROCKS. An outline study of general principles of petrography; classification of minerals and rocks and practice in their identification. GROUT.

19. ELEMENTS OF PALEONTOLOGY. An introduction to the study of fossil organisms. Lectures supplemented by field excursions. STAUFFER.

21-22†. ESSENTIALS OF MINERALOGY. Crystal systems, morphological, physical, and chemical character of minerals. Occurrence, genesis, and uses of minerals of economic value. Determinative work, blowpipe analysis, sight identification. GROUT, BRODERICK.

[1] This course satisfies the Junior College requirement for science under the new curriculum.

[2] This course does not satisfy the Junior College requirement for science under the new curriculum.

23-24-25†. MINERALOGY. The crystal systems; morphological, physical, and chemical characters of minerals; occurrence, genesis, and uses of minerals; classification and description of common minerals; rock minerals, and common rocks. Determinative work in laboratory, blowpipe analysis, sight identification. GROUT, BRODERICK.

27. OUTLINES OF MINERALOGY. A course designed especially for teachers. Methods of identification of minerals, laboratory practice, conferences, reference reading. GROUT.

29.[2] GENERAL PHYSIOGRAPHY. Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology. POSEY.

30.[2] PRINCIPLES OF GEOGRAPHY. A study of the life reactions to the major types of geographic environment; treats of the influence of climate, topography, soil, and mineral resources upon human affairs. (Not offered in 1920-21.) POSEY.

34.[2] METEOROLOGY. The properties and phenomena of the atmosphere, including composition, temperature, pressure, and circulation; the work of the weather bureau; the major climatic divisions of the earth and their climates. POSEY.

37.[2] ECONOMIC AND COMMERCIAL GEOGRAPHY. A study of the geographic factors influencing production and trade. Natural resources in their relation to commerce and industry and the major trade routes will be emphasized. POSEY.

51-52† ECONOMIC GEOLOGY. The mineral resources of the United States. The origin, distribution, and uses of the important minerals and mineral fuels. Lectures and field excursions.

57-58-59. PALEONTOLOGY. A study of fossil forms with special reference to those of geological importance. Faunas and their correlation. STAUFFER.

61. BLOWPIPE ANALYSIS. The determination of minerals by systematic blowpipe analysis. BRODERICK.

65. CRYSTALLOGRAPHY. Projection and geometric relations of crystal planes; crystal nomenclature; the relation of special properties to morphology. A study of crystal models, crystal drawing, identification of minerals from crystal measurements, and mathematical calculations. (Not offered in 1920-21.) BRODERICK.

85. FIELD WORK. About two weeks in June are spent in geologic mapping of selected areas in the iron districts of Minnesota. Involves preparation of geologic maps and written reports.

[2] This course does not satisfy the Junior College requirement for science under the new curriculum.

91-92-93. INDEX FOSSILS OF NORTH AMERICA. A study of fossils and their uses in correlation. A course intended primarily for mining geologists. STAUFFER.

101. PRINCIPLES OF STRATIGRAPHY. Origin and structure of sedimentary deposits; the interpretation of these in relation to paleogeography; field work in connection with Cambrian and Ordovician problems. TIEJE.

105. ELEMENTS OF ROCK STUDY. The occurrence and genesis of igneous, sedimentary, and metamorphic rocks; their mineral and chemical composition; their structure, texture, and alteration. The classification and description of rocks. GROUT, BRODERICK.

106. PETROGRAPHY. The identification and study of minerals and rocks by optical methods; the study of igneous rocks, crystalline schists, and metamorphic rocks. The origin and classification of rocks. GROUT, BRODERICK.

107-108-109. PALEONTOLOGIC PRACTICE. The collection, preparation, and study of materials, with a view to gaining a working knowledge of groups of fossils and the use of literature. STAUFFER.

111. ORE DEPOSITS. The nature, distribution, and genesis of ore deposits of the United States; relations of ore deposits to geologic structure; the deformation and superficial alteration of ore deposits. EMMONS.

112. GEOLOGY OF PETROLEUM. First part of course treats deposits of metals, giving special attention to those outside of United States. Second half treats the nature, origin, and distribution of petroleum and discusses various oil fields of the world. EMMONS.

113. PROBLEMS IN ORE DEPOSITS. Field excursions, map work, lectures on field and laboratory methods. EMMONS.

114. GEOGRAPHY OF NORTH AMERICA. The regional geography of the United States and Canada; their physiography, climate, natural resources, and people. The utilization and conservation of natural resources emphasized. POSEY.

115. GEOGRAPHIC INFLUENCES. A study of the influence of geographic factors of location, topography, climate, and natural resources upon the economic, social, and political development of America. POSEY.

116. GEOGRAPHY OF SOUTH AMERICA. Regional geography of the South American countries; their geology, topography, climate, natural resources, people. Trade relations between South American countries and the United States given special attention. POSEY.

117. Resources and Trade. Major commodities typical of the different sorts of national resources will be selected and a detailed study of their occurrence, production, manufacture, and exchange made. Posey.

118. Geography of Europe. Regional geography of Europe; the geology, topography, climate, natural resources, people, industries, and trade of these countries. Posey.

119. Geography of Asia. The regional geography of Asia in its physical, economic, commercial, and political aspects. Posey.

124-125. Structural and Metamorphic Geology. The conditions, processes, and results of metamorphism; structural features resulting from deformation under varying conditions of load. Schwartz.

131-132-133. Advanced Petrology. Advanced optical methods. Criteria for rapid identification of minerals and rocks. The uses of schedules and tables. Standard rock types. Regional and genetic studies. Petrographic reports. Grout.

137. Testing Economic Minerals. Methods of determining quality of mineral deposits, described and illustrated by laboratory tests of coal, oil, building stone, and metallic ores. Grout.

140-141. Applied Petrography. Determination of ores and gangue minerals. Microscopic studies of paragenesis of ores and other mineral associations. Practical problems in mining and geology, settled by microscopic and optical examination. Grout.

144-145. Construction and Interpretation of Geologic Maps. Methods of geological examination; study and problems in construction and interpretation of geologic maps. Schwartz.

150. Field Geology. Detailed, systematic work conforming with official surveys. Geologic maps, structure sections, reports; paragenesis of ores and their relations to geologic structures. Field for 1921, Black Hills, South Dakota. Reports to be written week before college opens in fall. Emmons, Johnston.

151-152-153. Advanced General Geology. Geologic processes and their results; development of the North American continent. Stauffer.

166-167. Mineralography. Methods of studying opaque minerals and the application of the methods to problems in ore genesis and history. Broderick.

GERMAN

Professor Carl Schlenker, Chairman; Frederick Klaeber (Comparative Philology); Assistant Professors Oscar C. Burkhard, James Davies, Alfred E. Koenig, Samuel Kroesch, Walter R. Myers; Instructors

LYNWOOD G. DOWNS, RICHARD JENTE; Assistants OTTO F. KUHLMAN, FLORENCE SCHWARZ; Teaching Fellows ESTHER HENDRICKSON, ESTHER STRAND; Scholar EMILY SCHULTE.

Major Advisers

Professor Schlenker; Assistant Professor Kroesch.

Major Sequences

Courses 50-51-52; 53-54-55; 62 or 63; 64; any two quarters of 65, 66, and 67; 18 additional credits from courses numbered above 50.

Sequence of Courses

For academic students.—Without entrance German, 1, 2, 3, 10, 11, 62, or 63, other courses numbered 50 or above. With one year entrance German, 2, 3, 4, 10, 11, 62 or 63, other courses numbered 50 or above. With two years entrance German, 12, 13, 14, 62 or 63, other courses numbered 50 or above. With three years entrance German, 13, 14, 62 or 63, other courses numbered 50 or above. With four years entrance German, 62 or 63, other courses numbered 50 or above.

For pre-medical students.—Without entrance German, 1, 2, 3, 10, 31-32. With one year entrance German, 2, 3, 10, 31-32. With two years entrance German, 15, 31-32. With more than two years entrance German, 31-32.

For chemists.—Without entrance German, 4-5-6, 7, 25-26. With one year entrance German, 7, 25-26. With two years entrance German, 15 or 12, 28-29. With more than two years entrance German, 28-29.

For pre-business students.—Without entrance German, 1, 2, 3, 10, 40. With one year entrance German, 2, 3, 10, 40. With two years entrance German, 12, 13, 40. With three or four years entrance German, 40.

COURSES

1. BEGINNING. Pronunciation, conversation, grammar, and composition; selected readings in easy prose and verse. KROESCH, MYERS, DOWNS, JENTE, SCHWARZ, STRAND.

2. BEGINNING, INTERMEDIATE. Continuation of Course 1. KROESCH, MYERS, DOWNS, JENTE, KUHLMAN, SCHWARZ, STRAND.

3. BEGINNING, ADVANCED. Selected texts from modern writers. SCHLENKER, DOWNS, KUHLMAN, STRAND.

4-5-6†. BEGINNING FOR CHEMISTS. Pronunciation, conversation, grammar, and composition; selected readings in easy prose. SCHLENKER, DOWNS.

7. INTERMEDIATE FOR CHEMISTS. Continuation of Course 4-5-6. DAVIES.

10. RAPID READING. Modern narrative prose. SCHLENKER, KROESCH, JENTE, KUHLMAN.

11. ADVANCED RAPID READING. Continuation of Course 10. Selected dramas from the eighteenth and nineteenth centuries. JENTE, KUHLMAN.

12. NARRATIVE PROSE. Reading texts selected from modern prose writers. Grammar review and composition. DAVIES.

13. ADVANCED NARRATIVE PROSE. Continuation of Course 12. DAVIES, HENDRICKSON.

14. PROSE AND POETRY. Narrative readings and selected poetry. Composition.

15. NARRATIVE PROSE FOR CHEMISTS AND PRE-MEDICAL STUDENTS. Reading, grammar review. KROESCH, DOWNS.

25-26†. ELEMENTARY SCIENTIFIC. For chemists. Reading from simple expository German. Selections from works on chemistry. DAVIES, DOWNS.

28-29†. ADVANCED CHEMICAL GERMAN. Selections from more difficult works on chemistry. SCHLENKER, MYERS.

31-32†. MEDICAL GERMAN. Readings from general works on physiology, anatomy, and bacteriology. BURKHARD, KROESCH, DOWNS.

40. COMMERCIAL GERMAN. Vocabulary of commerce, business forms; reading of texts on economics. JENTE.

50-51-52†. COMPOSITION. Aims to develop grammatical correctness. Translations from English selections. Essay writing on assigned subjects. DAVIES.

53-54-55†. CONVERSATION. Aims to develop ease and correctness of oral expression. Organized on the laboratory basis—one hour credit with two hours of recitation and one hour of outside reading. MYERS.

56-57-58. ESSAY WRITING. Discussion of the principles of structure and style; criticism of essays on assigned subjects. BURKHARD, KROESCH, MYERS.

59-60-61. ORAL DICTION. Oral exercises based upon studies in German cultural life; critical analysis of various works of German literature; argumentation and debate. (Not offered for 1920-21.) KOENIG.

62. GERMAN COMEDIES. Reading of the best comedies of the eighteenth and nineteenth centuries. DAVIES.

63. MODERN DRAMA. Plays of modern dramatists, Hauptmann, Sudermann, Fulda, and others. DAVIES.

64. CLASSIC DRAMA. Plays of Lessing, Goethe, and Schiller. DAVIES.

65. SURVEY OF GERMAN LITERATURE THROUGH THE REFORMATION PERIOD. Lectures, assigned readings, reports. BURKHARD.

66. SURVEY OF GERMAN LITERATURE OF THE EIGHTEENTH CENTURY. Lectures, assigned readings, reports. BURKHARD.

67. SURVEY OF GERMAN LITERATURE OF THE NINETEENTH CENTURY. Lectures, assigned readings, reports. BURKHARD.

72. DRAMA SINCE 1880. The beginnings of the dramatic revival; Sudermann and others. SCHLENKER.

73. DRAMA SINCE 1880. Hauptmann, Wedekind, Halbe, Schnitzler, and others. SCHLENKER.

77. GOETHE'S FAUST, PART I. Reading and interpretation of the text; genesis of the work; the Faust legends, Faust books, puppet plays, Marlowe's *Faustus*. SCHLENKER.

100-101-102†. MIDDLE HIGH GERMAN. Phonology, morphology, and syntax. Translation into the modern German. *Der arme Heinrich, Das Nibelungenlied*, selected poems of Walther. KROESCH.

107. HISTORICAL GERMAN GRAMMAR. Phonology, inflection, word formation, syntax. Intended primarily for prospective teachers of German. (Not offered in 1920-21.) KROESCH.

108. COMPARATIVE PHONETICS. A study of speech sounds, and the nature of their production with special reference to English, French, and German. Open to students of the modern languages. KROESCH.

109-110-111†. HISTORY OF THE GERMAN LANGUAGE. Lectures, discussions, assigned readings. This course is identical with Comparative Philology 109-110-111. KLAEBER.

120-121-122†. GERMAN DRAMA OF THE NINETEENTH CENTURY. Subjects will be announced from year to year. Subject for 1920-21: Hauptmann and contemporary writers. MYERS.

150-151-152. DIE NOVELLE. A study of the technique and development. Assigned readings and reports. (Not offered in 1920-21.) BURKHARD.

153-154-155†. ASPECTS OF GERMAN LITERATURE OF THE NINETEENTH CENTURY. The subject of the course will be announced from year to year. Subject for 1920-21: the development of realism in the nineteenth century. BURKHARD.

160-161-162†. LYRIC POETRY OF THE EIGHTEENTH AND NINETEENTH CENTURIES. Historical review of the best lyric poetry and chief writers. DAVIES.

225-226-227. LITERARY PROBLEMS.

GREEK

Professors CHARLES ALBERT SAVAGE, Chairman.

Major Adviser

Professor Savage.

Major Sequences

Sequence A. Courses 51-52-53; 105; 106 or 107; 108 or 109; Latin 51-52-53.

Sequence B. Courses 51-52-53; 105; 106 or 107; 108 or 109; History 133-134-135.

COURSES

1-2-3. BEGINNING GREEK. Grammar, composition, word-formations, oral exercises, and selected readings in simple prose and verse.

4-5-6. HISTORY AND EPIC POETRY. First quarter, selections from Xenophon's *Anabasis,* or from other historical prose; second quarter, selections from Herodotus; third quarter, selections from the *Iliad;* syntax, irregular verbs, dialectical forms; two quarters to be completed before credit is given. SAVAGE.

7. EVERY-DAY GREEK. A brief course in Greek sources of English words. The practical purpose is to enable students to trace the origin and feel the force of English words derived from Greek, and especially of scientific terms.

51. PHILOSOPHY. Plato's *Apology,* or selections from other dialogues of Plato, and from Xenophon's *Memorabilia.* SAVAGE.

52. ORATORY. Selections from Lysias and Demosthenes; study of the principles of Greek rhetoric and Greek oratory. SAVAGE.

53. DRAMATIC POETRY. One play of Euripides; introductory course in the drama. Special attention given to mythology and literary style. SAVAGE.

105. LYRIC POETRY. Selections from the elegiac, iambic, lyric, and bucolic poets. SAVAGE.

106. ADVANCED DRAMA. Aeschylus, Sophocles, or Aristophanes. Special attention given to the development of the drama, and to the literary form and dramatic representation of the plays read. SAVAGE.

107. ADVANCED PROSE. Selections from the Greek historians, or from Plato, or from the orators. Alternates with Course 106.

108. ADVANCED EPIC POETRY. A course of rapid readings in the *Iliad* or the *Odyssey.* The object of this course is to secure as intimate an acquaintance as possible, at first hand, with Homer. SAVAGE.

109. THE NEW TESTAMENT. Especially intended for those who are preparing for the ministry, or for some other form of religious work. Alternates with 108. SAVAGE.

COURSES FOR WHICH NO KNOWLEDGE OF GREEK IS REQUIRED

41. GREEK ARCHITECTURE. Textbook work and illustrated lectures on Greek architecture from earliest times; stereopticon views of temples, theaters, houses, altars, tombs, and other monuments; discussion of such topics as decoration, principles of proportion, and architectural style. (Not offered in 1920-21.) SAVAGE.

42. GREEK SCULPTURE. Development of Greek sculpture from its beginnings will be traced; famous statues, friezes, and reliefs will be shown and described; the personalities of the great sculptors, and their special contributions to art, will be considered. SAVAGE.

43. GREEK DRAMA. The reading and interpretation of representative Greek plays; lectures dealing with the origin, growth, character, and influence of the Greek drama; special stereopticon illustrations. Students taking this course may not receive credit for Course 62. SAVAGE.

44. GREEK LITERATURE AND LIFE. Lectures, textbook work, illustrative and assigned readings; special lectures illustrated by stereopticon views. Recommended to those who intend to teach Greek, Latin, English, or ancient history. SAVAGE.

45. GREEK MYTHOLOGY. Lectures, textbook work, and illustrative readings, supplemented by occasional stereopticon views. Recommended to those specializing in languages, literature, or philosophy. SAVAGE.

HISTORY

Professors GUY STANTON FORD, Chairman; CLARENCE W. ALVORD, WILLIAM S. DAVIS, NORMAN S. B. GRAS, ALBERT B. WHITE; Associate Professors SOLON J. BUCK, AUGUST C. KREY, BRUCE D. MUDGETT (Economics); Assistant Professors Z. CLARK DICKINSON (Economics), HAROLD QUIGLEY (Political Science), LESTER B. SHIPPEE, MASON W. TYLER, QUINCY WRIGHT (Political Science); Instructor GEORGE M. STEPHENSON.

Major Advisers

Professors Davis, Gras, and White; Associate Professors Krey and Buck; Assistant Professors Shippee and Tyler.

Major Sequences

Sequence A. In the junior year, any one of 105, 133-134, 135, 116-117-118, and 119; in the senior year, at least 10 credits in courses numbered from 151 to 200; in either year, courses numbered above 50 to make a total of at least 30 credits.

Sequence B. In the junior year, 101-102 or 107-108 (for students without 1-2) or 109-110 or 121-122 (for students without 3-4); in the senior year at least 10 credits in courses numbered 151 to 200; in either year courses numbered above 50 to make a total of at least 30 credits.

(Prerequisites: 1-2 or 3-4; 5-6; and at least one of 9-10, 11-12-13, 20, and Political Science 1 or 3.)

JUNIOR COLLEGE COURSES

1-2†. THE MODERN WORLD, 1648-1918. A historical survey of the last three centuries, dealing chiefly with those political, social, and economic movements which have combined to create the present-day world. FORD, KREY, TYLER.

3-4†. ENGLAND, 1066 TO THE PRESENT. General political history of England since the Norman Conquest, with special reference to development of governmental institutions. Serves as introduction to further work in English history, literature, and politics; and to American history. WHITE.

5-6. AMERICAN HISTORY. A general survey of the national period of American history, with a brief consideration of the revolutionary period as an introduction. Not open to freshmen, except third quarter freshmen who have ten credits in history. SHIPPEE.

9-10†. INTRODUCTION TO ECONOMIC HISTORY WITH SPECIAL EMPHASIS ON THE UNITED STATES. Lectures and section work. A general survey of the development of agriculture, manufacture, transportation, storage, and the exchange of goods; land, capital, management, and labor; the interplay of economic and political forces. Primarily for pre-business students, but open to others who have ten credits in history. GRAS, MUDGETT, DICKINSON, and others.

11-12-13†. MEDIEVAL HISTORY THROUGH THE REFORMATION. Development of Europe from the fall of the Roman Empire in the West, with special reference to social, intellectual, and artistic movements of the period. Primarily for music and architecture students, but open to others who have ten credits in the social science group. KREY.

25. WORLD POLITICS. A study of the foreign policies and international relations of the leading European powers to-day. Prerequisite, ten credits in history or political science. TYLER, QUIGLEY.

SENIOR COLLEGE COURSES

American History

112. HISTORY OF AMERICAN IMMIGRATION. Settlement and development of typical racial stocks in America. Contributions of European immigrants to American life; their social, political, and religious activity; reaction to American conditions. Considerable attention to political history: Native American and Know-nothing parties, etc. STEPHENSON.

125. AMERICAN DIPLOMATIC HISTORY. Attention to the principles and policies guiding American diplomacy in its stages of development as well as to the methods pursued and the personality of American diplomats. Identical with Political Science 125. WRIGHT.

127. AMERICAN FOREIGN RELATIONS. Such topics as the Monroe Doctrine, freedom of the seas, the open door, arbitration, and disarmament will be considered with particular reference to the future policy of the United States. Identical with Political Science 127. WRIGHT.

140. RECENT AMERICAN HISTORY. A study of American development from 1876 to the present time. Particular attention is paid to the economic, social, and international aspects of the period. SHIPPEE.

141. THE WEST IN AMERICAN HISTORY TO 1815. The westward movement of population and civilization; its political, economic, and social aspects; effects upon national development. (Not offered in 1920-21.) BUCK.

142. THE WEST IN AMERICAN HISTORY, 1815-1865. The settlement of the Mississippi Valley, and the beginnings of Pacific coast expansion; significance in general American development. This course, while offered separately, follows, and is calculated to form a natural sequence to History 141. (Not offered in 1920-21.) SHIPPEE.

144-145†. HISTORY OF MINNESOTA. The settlement and development—political, economic, and social—of a typical American commonwealth. BUCK.

146-147†. CONSTITUTIONAL HISTORY OF THE UNITED STATES. A study of the evolution of American constitutional government through legislation, judicial interpretation, and administrative rule and custom. Primarily for pre-legal students, but open to other students in the College of Science, Literature, and the Arts. SHIPPEE.

148-149-150†. BRITISH EMPIRE IN THE EIGHTEENTH CENTURY. A study of imperial politics, including the development of the English colonies in America and the American Revolution. ALVORD.

153. THE WEST IN AMERICAN POLITICS SINCE 1865. An intensive study of independent parties and radical or progressive political movements. (Not given in 1920-21.) BUCK.

154. SELECTED TOPICS IN THE HISTORY OF MINNESOTA. BUCK.

155. THE UNITED STATES, 1850-1865. An intensive study of the period beginning with the Compromise of 1850 and extending through the Civil War; consideration of social and economic questions as well as political issues. (Not offered in 1920-21.) SHIPPEE.

156. THE RECONSTRUCTION PERIOD. An intensive study of the period after the close of the Civil War. This course follows History 155 as a natural sequence. SHIPPEE.

160. SELECTED TOPICS IN LATER AMERICAN COLONIAL HISTORY. ALVORD.

166. SELECTED TOPICS IN THE HISTORY OF IMMIGRATION. Competent students will be guided in research. STEPHENSON.

See also †113-114-115 under Economic History; †121-122 under English History; and 111 under European History.

Ancient History

103. THE NEAR EAST, OLD ORIENT. Origin of Egyptians, Babylonians, Assyrians, and Persians, and main features of their political history and civilization. History of the Hebrews discussed so far as it bears upon general oriental problems. DAVIS.

105. HISTORY OF ROME. Roman institutions, especially those which affected the later world. Conquest of Roman world; founding of the Roman Empire, and history of empire up to the period of its decline. DAVIS.

133-134. ANCIENT CIVILIZATION: GREECE. Social and intellectual life of Greece. The course will begin with a survey of political history. DAVIS.

135. ANCIENT CIVILIZATION: ROME. Social and intellectual life of Rome. The course will begin with a survey of political history. DAVIS.

Economic History

113-114-115†. ECONOMIC HISTORY OF EUROPE AND THE UNITED STATES, 1750 TO THE PRESENT. The industrial revolution and significant results for transportation, agriculture, tariff, and labor. GRAS.

116-117-118†. ECONOMIC HISTORY OF EUROPE, 1300-1750. The chief interests are the manor; the town; the metropolis; national economic regulation; developments in agriculture, commerce, manufacture, and economic thought, leading up to the industrial revolution. (Not given in 1920-21.) GRAS.

English History

109-110. ENGLISH HISTORY, 1815-1920. Assigned readings and lectures. Emphasis placed upon party history, the colonies, foreign relations, the social-democratic movement, and especially British foreign policy preceding the Great War. (Not given in 1920-21.)

121-122†. ENGLISH BACKGROUNDS AND THE AMERICAN COLONIES. Studies in the transfer of English civilization, and its early modifications and development in America. Some account taken of the contrasting French settlements. WHITE.

137-138†. ENGLISH LEGAL INSTITUTIONS. Beginnings of legal institutions and ideas among the Teutonic peoples, and the development of courts and procedure in England. (Not given in 1920-21.) WHITE.

162. THE BEGINNINGS OF PARLIAMENT. Parliamentary beginnings from the Norman Conquest to the reign of Edward I, based wholly on original sources. Demands knowledge of at least high-school Latin. WHITE.

183. THE STUART PERIOD. Emphasizes selected problems connected with the Long Parliament. (Not given in 1920-21.)

See also courses in economic history.

European History

101-102†. THE FRENCH REVOLUTION. French conditions in the eighteenth century before 1774; events between 1774 and 1789 which precipitated revolution in France; reform work of the early revolution. Reading knowledge of French desirable. FORD.

104. THE NEAR EAST, MODERN. Turkey, the Balkan States, and European diplomacy in the East since 1453, with special reference to the causes of the war of 1914. DAVIS.

107-108. EUROPE, 1848-1914. The development of Europe in its various phases—political, social, and economic—from the Revolution of 1848 to the outbreak of the war of 1914. A reading knowledge of French or German will be helpful. TYLER.

111. EUROPEAN BACKGROUND OF AMERICAN IMMIGRATION. The history of the movement of population from Europe to America in the nineteenth century, with the emphasis on the economic, political, social, and religious forces. STEPHENSON.

119. THE RENAISSANCE AND REFORMATION. The Renaissance and Reformation as general European movements with especial emphasis upon the work of individual men and upon ideas rather than upon politics and institutions. KREY.

157-158. SELECTED TOPICS IN NINETEENTH CENTURY HISTORY. A detailed study of selected topics in the history of the nineteenth century. Discussion based on a wide range of reading. A reading knowledge of French or German will be required. FORD, TYLER.

164. STUDIES IN THE CRUSADES. Problems connected with the crusades. Demands knowledge of at least high-school Latin. KREY.

See also courses in economic history.

HOME ECONOMICS

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Professor MILDRED WEIGLEY, Chief; Associate Professors HARRIET GOLDSTEIN,[1] MARION WELLER; Assistant Professors ALMA BINZEL, AMY P. MORSE, E. MAUD PATCHIN; Lecturer in Hygiene MARTHA B. MOORHEAD; Instructors CARLOTTA BROWN, ALICE CHILD, HALLY J. FISHER, VETTA GOLDSTEIN, RUTH LINDQUIST, MABEL C. MCDOWELL, MARGARET K. MUMFORD, ETHEL L. PHELPS.

COURSES

3. TEXTILES. A study of textile fibers, their structure, properties, and chemical reactions; of fabrics, their structure and processes of manufacture; of art and economic considerations in selection and purchase of materials for clothing and household furnishing. WELLER.

11. GARMENT-MAKING. Instruction and laboratory practice in hand sewing; in the reading and adaptation of commercial patterns; in the construction and use of the sewing machine; in designing, cutting, and making simple outer garments from washable materials. MCDOWELL.

13. DRESSMAKING. Consideration of quality, suitability, and cost of materials adapted to technique involved in construction of simple wool and silk dresses; adaptation of art principles in selection of designs; instruction and practice in methods of construction. PATCHIN, MCDOWELL.

17. ADVANCED CLOTHING CONSTRUCTION. Laboratory course involving the application of principles of costume-modeling in the construction of one high grade garment, suit, coat, or dress. One day a week will be given to a millinery problem. WELLER, BROWN, PATCHIN.

21. FOODS AND COOKERY. (a) Production, manufacture, chemical composition of typical foods; their classification into food principles; changes in digestion; function in nutrition; (b) fundamental science principles from chemistry, physics, biology, bacteriology, and their application in typical cookery processes. CHILD.

22. FOOD ECONOMICS. Cost and nutritive value of typical foods; the study of dietaries; preparation and serving of meals, the cost bearing a definite relation to the family budget. CHILD.

[1] Absent on leave, winter and spring quarters, 1920-21.

34. HOME MANAGEMENT: OPERATION AND MAINTENANCE. Lectures. The family budget for varying incomes, and for the home management house; household accounts. LINDQUIST.

37. HOME CARE OF THE SICK. (a) First aid; communicable diseases; their transmission and prevention; hygiene of infancy, maidenhood, maturity. (b) The care of the sickroom; observation and care of the patient; elementary symptomatology. MOORHEAD, FISHER.

40. CHILD TRAINING. Application of modern science in rearing, training, and educating children. Emphasis is placed on the physical care of the baby; infant-feeding; infant diseases; early training; obligation of the home; the obligation of the nation. BINZEL, FISHER.

51. DRAWING AND DESIGN. Composition, perspective; principles of design and color harmony applied to live and area designs, dress designs, and interiors. HARRIET and VETTA GOLDSTEIN.

52. ART HISTORY AND APPRECIATION. The historical development of art, architecture, decoration, furniture, and costume studied with special emphasis on design and influence upon modern styles. HARRIET and VETTA GOLDSTEIN.

53. ADVANCED DESIGN. Problems in design for house furnishings and for costume, including dress-modeling. HARRIET and VETTA GOLDSTEIN.

70. FOOD PREPARATION IN RELATION TO SOCIAL WORK. A study of the principles underlying cookery with special emphasis on the preparation of foods to be used in homes with limited incomes. LINDQUIST.

71. ELEMENTARY DIETETICS FOR THE SOCIAL WORKER. Involves principles underlying adequate feeding. Food habits of different economic and racial groups forming the basis for actual planning and preparation of meals. MUMFORD.

72. HOME MANAGEMENT PROBLEMS. Involves the making of sound budgets. Studies are based upon racial groups and the size of the family, together with the income. LINDQUIST.

123. CLOTHING ECONOMICS. General consideration of the economic problems in clothing production; woman's responsibility for conditions in textiles and clothing industries; study of budget for clothing and household textiles, hygiene and standardization of dress. WELLER.

HUMAN ANATOMY

THE MEDICAL SCHOOL

Professors CLARENCE M. JACKSON, Chairman; JOHN B. JOHNSTON, THOMAS G. LEE, RICHARD E. SCAMMON; Associate Professor CHARLES A. ERDMANN; Associate Professor ANDREW T. RASMUSSEN.

COURSES

5-6-7. GROSS HUMAN ANATOMY. Dissection, including osteology. A disarticulated skeleton issued to every two students. Every student required to dissect lateral half of the body. JACKSON, ERDMANN, and others.

103. HUMAN HISTOLOGY. Microscopic study of the various tissues and organs. SCAMMON, and others.

107. HUMAN EMBRYOLOGY. Development of the human body. Required of third-year medical students. SCAMMON, LEE, and others.

111. HUMAN NEUROLOGY. A study of the central nervous system and sense organs. JOHNSTON, RASMUSSEN.

121. ANATOMICAL TECHNIQUE. Microtechnique, reconstruction, and museum methods, etc. LEE.

129-130-131. TOPOGRAPHIC ANATOMY. Based upon a study of serial cross-sections of the human body. JACKSON.

133. ANATOMY OF THE FETUS AND CHILD. A survey of prenatal and postnatal human development. SCAMMON.

134. ANATOMY OF THE NEWBORN. A detailed laboratory study of the anatomy of the newborn. SCAMMON.

135. PHYSICAL DEVELOPMENT OF CHILDHOOD. Lectures, with study of illustrative material. Primarily for students in education; open to others by permission. SCAMMON.

153-154-155-156. ADVANCED ANATOMY. Advanced work, largely individual in character, in gross anatomy, histology, embryology, or neurology. JACKSON, JOHNSTON, LEE, SCAMMON, RASMUSSEN.

160-162-163. SEMINAR IN GROWTH OF CHILDREN. A study with graphic analysis of data on physical development of children of school age. SCAMMON.

HUMAN PHYSIOLOGY

THE MEDICAL SCHOOL

Professors ELIAS P. LYON, Dean; FREDERICK H. SCOTT; Associate Professors RICHARD O. BEARD, JESSE F. MCCLENDON; Assistant Professors FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETTIBONE; Instructors ESTHER GREISHEIMER; CHARLES C. GAULT.

Major Advisers

Professor Scott; Assistant Professor Pettibone.

Major Sequences

Sequence A. Physiology. 100-101; 103; 104; 6 credits in courses numbered 110 to 138.

Sequence B. Physiologic chemistry. 100-101; 103; 104; 6 credits in courses numbered 153 to 164.

COURSES

1-2-3. HUMAN PHYSIOLOGY AND HYGIENE. A course offered especially to teachers, on Saturday mornings. Lectures, demonstrations, and laboratory. Repeated each quarter. LYON, BEARD, and Assistants.

4. HUMAN PHYSIOLOGY. A course offered to academic, agricultural and home economics students. Lectures and laboratory work.

6. PHYSIOLOGIC CHEMISTRY. Brief course. PETTIBONE and Assistants.

7. HUMAN PHYSIOLOGY. (For dental students.) Somewhat more extended than 4. Dental students and others. SCOTT.

100-101. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta, and metabolism. KINGSBURY, PETTIBONE, and Assistants.

103. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, AND DIGESTION. SCOTT, LYON, MCCLENDON, and Assistants.

104. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES. Respiration, metabolism, nutrition, and excretion. SCOTT, LYON, BEARD, MCCLENDON, and Assistants.

110. PHYSICAL CHEMISTRY OF VITAL PHENOMENA. Osmotic pressure surface tension, electric conductivity, hydrogen-ion concentration. MCCLENDON.

111. MINERAL METABOLISM. Functions of inorganic constituents of the body and changes in mineral metabolism in disease. Prerequisite, 110f or arrange. MCCLENDON.

112. VITAMINES. Physico-chemical conditions necessary for the preservation of the vitamines during the storage and cooking and other preparation of foods. MCCLENDON.

113. PROBLEMS IN PHYSIOLOGY. Arranged by instructors with qualified students. Each student will be assigned a topic for special laboratory study. Conference and reading. LYON, SCOTT, MCCLENDON, GREISHEIMER.

131. ADVANCED PHYSIOLOGY OF MUSCLE, BLOOD, CIRCULATION, AND DIGESTION. Alterations due to physiological conditions. SCOTT.

132. ADVANCED PHYSIOLOGY OF RESPIRATION, EXCRETION, METABOLISM, NERVOUS SYSTEM, AND SENSE ORGANS. Conference and laboratory. SCOTT.

137. Foods and Practical Dietetics. A study of human foods and food values; principles of food selection, balanced rations, etc. Beard, Thomas.

138. Physiology of Development. The physiology of the ovum, embryo, fetus; generative functions; functional characteristics of successive ages. Beard.

153. Advanced Physiologic Chemistry. Course arranged by instructors with qualified students for special work. Pettibone, Kingsbury.

154. Gastro-Intestinal Analysis. The use of stomach and duodenal and intestinal tubes and analysis of the contents. The effect of hydrogen ions on enzymes and substrate and on the bacteriology of the digestive tract. McClendon.

155. Experimental Acidosis. Analysis of blood, urine, and alveolar air in starvation, wood-alcohol poisoning, anesthesia, shock, and other forms of experimental acidosis. The alkaline reserve of the body and the effect of acidosis on mineral metabolism. McClendon.

156. Biochemistry of the Teeth. The effect of diet on the composition of the saliva and the state of the teeth and gums. McClendon.

161. Urinalysis. Advanced methods. Pettibone.

162. Chemical Analysis of Blood, including total nitrogen, total non-protein nitrogen, urea, uric acid, creatinine, cholesterol, chloride, sugar, and other constitutents. Pettibone.

163. Metabolism. Lectures and laboratory work on special phases of metabolism. Lectures may be taken alone; number of students unlimited; laboratory course limited to ten students. Pettibone.

164. Quantitative Methods. The estimation of certain important substances in the urine, blood, and other body fluids. (Not offered in 1920-21.) Kingsbury.

JOURNALISM

COURSES

Assistant Professor Norman J. Radder, Chairman.

13-14-15†. Reporting. Writing and rewriting types of stories covered by reporters for metropolitan newspapers. Exercises in elimination of useless words and phrases; frequent tests on knowledge of current news. Assignments for *Minnesota Daily* and Minneapolis and St. Paul papers. Radder.

51-52†. Editing. Instruction and practice in editing copy, correcting proof, writing headlines, make-up, and rewriting. Associated Press and United Press copy is used. Lectures on law of libel and copyright and on newspaper ethics.

55. SPECIAL FEATURE STORIES. Lectures and practice in preparing special articles for newspaper and magazine publication, study of the newspaper feature story; examination of the magazine market and the needs of trade journals. RADDER.

61. EDITORIAL WRITING. Emphasis on subject-matter. Lectures by members of the departments of Economics, Political Science, History, and Sociology. Analysis of various types of newspaper and magazine editorials with practice in writing. RADDER.

65. NEWSPAPER PROBLEMS. Detailed study of the news policy responsible for the success of the more important American newspapers. Discussion of the problems of newspaper editing and publishing. RADDER.

67. PRACTICAL NEWSPAPER WORK. Practical work arranged in connection with trade journals and Minneapolis and St. Paul newspapers, in the last quarter of the senior year. RADDER.

LATIN

Professor JOSEPH B. PIKE; Instructor ROBERT V. CRAM.

Major Adviser

Professor Pike.

Major Sequences

Sequence A. Courses 51-52-53; 121-122-123; 221-222-223.
Sequence B. Courses 51-52-53; 121-122-123; Greek 51-52-53.
Sequence C. Courses 51-52-53; 121-122-123; History 133-134-135.

(Prerequisites: any two of 21, 22, and 23. Students entering with two or three years of Latin will take any two of 11, 12, and 13 in their first year and any two of 21, 22, and 23, in their second year. Students entering with no Latin will take 1-2 and 3 in their first year, 11-12 and 13 in the second year, and any two of 21, 22, and 23 in their third year.)

JUNIOR COLLEGE COURSES

1-2†. BEGINNING LATIN. Ten weeks are spent in mastering inflections; the remainder of the course is devoted to reading easy Latin prose and the study of elementary syntax.

3. CAESAR. Selections from the Gallic War are read. Elementary Latin composition is taken in connection. Students entering with one year of Latin may select this course.

11-12†. SELECTIONS FROM LATIN AUTHORS. An effort is made to give a general view of Roman life and literature. Students entering with two or three years preparation in Latin may elect 12 without 11.

13. SELECTIONS FROM THE WORKS OF OVID. A continuation of Course 3. Students entering at third quarter with two or three years' preparation in Latin may select Course 13.

21. LIVY. Selections from Books 1 to 10.

22. PLAUTUS AND TERENCE. One play each of Plautus and Terence with a study of the beginnings of Roman drama. Students entering at second quarter with four years' preparation in Latin may select Course 22.

23. HORACE, ODES, SATIRES, AND EPISTLES. Selections from these works.

SENIOR COLLEGE COURSES

51. PLINY'S LETTERS. Selected letters of Pliny the Younger with a study of Roman society in his time.

52. APULEIUS' SHORT STORIES. Reading of Apuleius' tales and a study of the Roman novel.

53. SUETONIUS. Lives of Tiberius, Caligula, Claudius, and Nero.

61. ROMAN LITERATURE AND LIFE. Lectures, textbook work, and assigned reading in standard translations.

121. ADVANCED VERGIL. Selections from Books 7-12 of the Aeneid. Alternates with Course 131. (Not offered in 1920-21.)

122. CICERO'S LETTERS.

123. MEDIEVAL LATIN. Selected documents illustrating conflict between church and state in Middle Ages. Selections from history of Franks by Gregory of Tours. Aims to accustom students to handle medieval Latin easily for historical and literary purposes.

131. JUVENAL. Selected satires. Alternates with Course 121.

132. SENECA'S EPISTLES. Alternates with Course 122. (Not offered in 1920-21.)

133. PETRONIUS AND VULGAR LATIN. Selections from Petronius and the *Peregrinatio Sanctae Silviae*. The relation of vulgar to literary Latin will be discussed. Alternates with Course 123. (Not offered in 1920-21.)

201-202-203. ANNALS OF TACITUS. Books I to VI. Graduate seminar, but open to students who register for a major in Latin, Offered every third year. (Not offered in 1920-21.)

211-212-213. LUCRETIUS. Graduate seminar but open to students who register for a major in Latin. Offered every third year. (Not offered in 1920-21.)

221-222-223. ANNALS OF TACITUS. Books XI to XVI. Graduate seminar but open to students who register for a major in Latin.

MATHEMATICS

Professors WILLIAM H. BUSSEY, Chairman; DUNHAM JACKSON; Associate Professors ROYAL R. SHUMWAY, ANTHONY L. UNDERHILL; Assistant Professors RALPH M. BARTON, RAYMOND W. BRINK, WILLIAM L. HART; Instructors MINNA SCHICK, ELLA THORP.

Major Advisers

Professor Jackson; Assistant Professors Brink and Underhill.

Major Sequence

Courses 50, 51, 52, 62, 63, 71 and either 106-107-108, or 102-103-104 or Physics 101-103-105.

COURSES

1. HIGHER ALGEBRA. A review and a collegiate treatment of the topics of elementary algebra for those who have had one year of elementary algebra. Not open to those who presented higher algebra for entrance.

6. TRIGONOMETRY. Logarithms and plane trigonometry.

7. COLLEGE ALGEBRA. Quadratic equations, equations in the quadratic form, simultaneous quadratic equations, graphical representation, progressions, mathematical induction, the binomial theorem, permutations, combinations, probability, determinants, and the theory of equations with special reference to graphical methods.

8. COMMERCE ALGEBRA. Selected topics in college algebra with emphasis on logarithms and on those phases of the subject which are of most importance in applications to business problems. Open only to students in the Pre-Business Course.

16. SOLID GEOMETRY. A collegiate treatment of solid and spherical geometry intended primarily for those who did not have the subject in high school and who are planning to specialize in mathematics. Not open to those who presented solid geometry for entrance.

20. THE MATHEMATICS OF INVESTMENT. First principles of the mathematical theory of interest, annuities, amortization, valuation of bonds, sinking funds and depreciation, etc., with brief discussion of probability and its application to life annuities and some problems in life insurance.

30. ANALYTIC GEOMETRY. The elements of plane analytic geometry including the geometry of the conic sections, with a brief introduction to solid analytic geometry.

50.[1] CALCULUS I. Differential calculus.

51.[1] CALCULUS II. Integral calculus.

52.[1] CALCULUS III. Selected topics in differential and integral calculus with special reference to infinite series, partial differentiation, multiple integrals and applications of the calculus.

62-63. THEORY OF EQUATIONS. Cubic and biquadratic equations, the solution of numerical algebraic equations, reciprocal equations and the construction of regular polygons, determinants and symmetric functions with applications to systems of linear equations and the theory of elimination.

70. HISTORY OF ELEMENTARY MATHEMATICS. A brief course in the history of arithmetic, algebra, and geometry intended primarily for those who are preparing to teach high-school mathematics.

71. SOLID ANALYTIC GEOMETRY. The analytic geometry of space of three dimensions. It should be taken by those who expect to do graduate work in mathematics, physics, or astronomy.

80-81-82. MECHANICS. An introduction to theoretical mechanics as deduced from a small number of fundamental principles, with applications to a large variety of problems; analytical and graphical statics; motion of particles and of rigid bodies.

102-103-104. ADVANCED ANALYTIC AND SYNTHETIC GEOMETRY. An introduction to modern methods of studying the straight line and the conic; the use of imaginaries in geometry; abridged notation; homogeneous coördinates; contact of conics; envelopes; an harmonic ratio; polar reciprocation; projection; inversion. (Not offered in 1920-21.)

106-107-108. ADVANCED CALCULUS AND DIFFERENTIAL EQUATIONS. Selected topics in advanced differential and integral calculus and a study of the more common types of differential equations with emphasis on applications to geometry, elementary mechanics, and physics.

140. THE METHOD OF LEAST SQUARES. The same as Astronomy 140.

Courses in Functions of a Real Variable, Modern Higher Algebra, Projective Geometry, and Differential Geometry, listed in the Graduate School bulletin, are open to properly qualified juniors and seniors. For more information consult the chairman of the Department of Mathematics.

MILITARY SCIENCE AND TACTICS

Professor ALBERT G. GOODWYN, Captain, Infantry, U.S.A., Chairman; Assistant Professors BEN W. FIELD, Captain, Infantry, U.S.A.; LAURENCE T. WALKER, Captain, Coast Artillery Corps, U.S.A.; LEE R.

[1] Courses 50, 51, 52 constitute a course in differential and integral calculus in three parts. The course is so arranged that the student may discontinue it at the end of Calculus I or the end of Calculus II, but students who expect to do graduate work in mathematics, physics, or astronomy, ought to finish Calculus III.

WATROUS, JR., Captain, Coast Artillery Corps, U.S.A.; EDGAR B. MOOMAU, 1st Lieutenant, Infantry, U.S.A.; HARVEY G. THOMAS, 1st Lieutenant, U.S.A., Retired; Instructors JOEL R. BAKER, Master Signal Electrician, Signal Corps, U.S.A.; ALFRED BRANDT, Regimental Sergeant Major, Infantry, U.S.A.; HENRY W. BROWN, Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; KENNA B. CALDWELL, Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; AUBREY R. DUNKUM, 1st Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; WILLIAM FINKE, 1st Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; JOSEPH HAVLICEK, Regimental Commissary Sergeant, Infantry, U.S.A., Retired; WILLIAM L. HOGAN, 1st Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; INGVALD M. JOHNSON, 1st Sergeant, Infantry, Unassigned, U.S.A.; JOSEPH LEES, 1st Sergeant, Infantry, U.S.A., Retired; JOHN MCWILLIAMS, 1st Sergeant, Infantry, U.S.A., Retired; WILLIAM G. PALMS, Sergeant, Infantry, Unassigned, U.S.A.

1-2-3. FIRST-YEAR BASIC COURSE R.O.T.C. Practical instruction in schools of the soldier, company, and battalion; signals, ceremonies, first aid.

4-5-6. SECOND-YEAR BASIC COURSE R.O.T.C. Practical and theoretical instruction in schools of the company and battalion; advance and rear guard drill; practical and theoretical instruction in guard duty. Gallery practice. Ceremonies. Infantry, coast artillery, and signal corps.

51-52-53. FIRST-YEAR ADVANCED COURSE R.O.T.C.

54-55-56. SECOND-YEAR COURSE R.O.T.C.

MUSIC

Professor CARLYLE SCOTT, Chairman; Assistant Professor DONALD N. FERGUSON; Instructors GEORGE FAIRCLOUGH, THADDEUS GIDDINGS, GERTRUDE R. HULL, HARRISON W. JOHNSON, ABE PEPINSKY, GERTRUDE REEVES, KARL SCHEURER.

COURSES

1-2-3. HARMONY. The study of chords, their construction, relations, and progressions. Written exercises on basses, the harmonization of given melodies. SCOTT.

4-5-6. COUNTERPOINT. Strict counterpoint up to eight parts; free contrapuntal harmonization of chorales and composition of smaller contrapuntal forms such as inventions. FERGUSON.

7-8-9-88-89-90. EAR-TRAINING. REEVES.

10-11-12. COMPOSITION. For those specializing in music. May be taken only with the consent of the instructor. FERGUSON.

11-12-13. ANALYSIS. The analysis of musical works as regards their formal construction: subdivisions of themes into phrases, sections, and

motives. Symphonies to be presented by the local orchestra are among the compositions used in this course. SCOTT.

14-15-16. HISTORY OF MUSIC. Some account of primitive systems and of the early Christian modal and harmonic developments, leading to a general survey of musical literature from Bach to the present time. FERGUSON.

17-18-19. APPRECIATION OF MUSIC. A non-technical course. REEVES.

20-21-22. BACH AND BEETHOVEN, WAGNER AND BRAHMS. Critical study of selections from master works of the four greatest composers. Biographical readings, topics, and analyses, giving historical and literary background to culminating periods in composition. FERGUSON.

25-26-27. ENSEMBLE-PLAYING. Study and reading of chamber-music literature, embracing compositions in the form of duos, trios, quartets, and other larger combinations for strings and wind instruments both with and without the pianoforte. PEPINSKY.

28-29-30. FIRST-YEAR ORGAN. FAIRCLOUGH.

31-32-33. SECOND-YEAR ORGAN. FAIRCLOUGH.

34-35-36. THIRD-YEAR ORGAN. Open to juniors. May be taken only with the consent of the instructor. FAIRCLOUGH.

37-38-39. FOURTH-YEAR ORGAN. Open to seniors. May be taken only with the consent of the instructor. FAIRCLOUGH.

39-40-41. FIRST-YEAR PIANOFORTE. SCOTT, FERGUSON, JOHNSON, REEVES.

42-43-44. SECOND-YEAR PIANOFORTE. SCOTT, FERGUSON, JOHNSON, REEVES.

45-46-47. THIRD-YEAR PIANOFORTE. Open to juniors, who have mastered technical difficulties of the degree of Czerny's *School of Velocity* and the easier Haydn and Mozart sonatas. SCOTT, FERGUSON, JOHNSON, REEVES.

48-49-50. FOURTH-YEAR PIANOFORTE. Open to seniors. Same requirements as for 45-46-47. SCOTT, FERGUSON, JOHNSON, REEVES.

51-52-53. FIRST-YEAR VIOLIN. SCHEURER.

54-55-56. SECOND-YEAR VIOLIN. SCHEURER.

57-58-59. THIRD-YEAR VIOLIN. Open to juniors. May be taken only with the consent of the instructor. SCHEURER.

60-61-62. FOURTH-YEAR VIOLIN. Open to seniors. May be taken only with the consent of the instructor. SCHEURER.

63-64-65. FIRST-YEAR VOCAL TRAINING. HULL.

66-67-68. SECOND-YEAR VOCAL TRAINING. HULL.

69-70-71. THIRD-YEAR VOCAL TRAINING. Open to juniors. May be taken only with the consent of the instructor. HULL.

72-73-74. FOURTH-YEAR VOCAL TRAINING. Open to seniors. May be taken only with the consent of the instructor. HULL.

81-82-83. NORMAL PIANO. Special course offered to students desiring to teach pianoforte as a profession. REEVES.

84-85-86. ADVANCED NORMAL PIANO. Practice teaching. REEVES.

91-92-93. ORCHESTRA. Study of standard orchestral literature and accompaniment of vocal and instrumental soloists. This ensemble group is an ideal campus institution, supporting and inducing campus spirit and activities. PEPINSKY.

94-95-96. OTHER ORCHESTRAL INSTRUMENTS.

97-98-99. UNIVERSITY CHOIR. Open to juniors and seniors. May be taken only with the consent of the instructor. May be taken a second year with credit. SCOTT.

100-101-102. ROMANTIC MOVEMENT. An analytical course covering the romantic movement with illustrations by the instructor. Papers assigned during the year. JOHNSON.

103-104-105. ADVANCED HARMONY. Harmony 1-2-3 prerequisite. A course designed to develop more freedom in expression and in musical effect. Especial attention given to modulations. SCOTT.

106-107-108. ADVANCED COUNTERPOINT. The fundamentals of double counterpoint and canon in strict and free styles, with application to the fugal and freer contrapuntal forms. FERGUSON.

PHILOSOPHY

Professors NORMAN WILDE, Head; DAVID F. SWENSON; Assistant Professor RUPERT C. LODGE.

Major Adviser

Professor Lodge.

Major Sequences

From 27 to 36 credits in Senior College courses, including Courses 113-14-15, 135 or 151-2-3, 141 or 147.

COURSES

1. PROBLEMS OF PHILOSOPHY. A survey course in philosophy, in which the main fields of investigation are mapped out, the permanent problems indicated, and the chief methods employed in their solution discussed. SWENSON, LODGE.

2. LOGIC. The nature of knowledge, the laws of reasoning, the principles and methods of scientific proof. SWENSON, LODGE.

3. ETHICS. The principles of morals; sketch of the historical development of morality followed by an analysis of its meaning, and of its basis in human nature. WILDE.

10. SCIENCE AND RELIGION. Religious problems as affected by the results of modern science. (Not given 1920-21.) SWENSON.

50-51. PRESENT-DAY PHILOSOPHY. An untechnical discussion of the most important types of contemporary philosophy. Among the men and movements included are: Royce, James, Eucken, Bergson, Haeckel, Neo-Realism, Nietzsche. WILDE.

55. ESTHETICS. An introduction to the history and theory of esthetics, psychological analysis of beauty, and a discussion of the arts. SWENSON.

100-101-102.[1] PHILOSOPHY OF RELIGION. Religion as an interpretation and evaluation of life. Fall quarter, a survey of historical and psychological phenomena of various religions; winter and spring quarters, a critical discussion of esthetic, ethical, and religious attitudes toward life. SWENSON.

104. HISTORY OF ESTHETICS. A survey of the chief esthetic theories of ancient and modern thinkers. (Not given 1920-21.) SWENSON.

106. PHILOSOPHY OF EDUCATION. A discussion of philosophically formulated ideals of education, with an attempt to reach a positive philosophy of educational values. SWENSON.

108-109. HISTORY OF ETHICS. A survey of the chief ideals of conduct and theories of life from Socrates to the present day. Emphasis upon both the historical conditions, and the permanent elements of value in the main ethical standpoints. LODGE.

113-114-115. HISTORY OF PHILOSOPHY. Outline of the history of thought from the Greeks to Kant. Intended as a cultural course, as well as a preparation for the study of special periods. WILDE.

120. SCANDINAVIAN PHILOSOPHY. The philosophical thought of the nineteenth century in Scandinavian countries, including a comparative study of Boström and Kierkegaard. (Not given 1920-21.) SWENSON.

124. POLITICAL AND SOCIAL ETHICS. The fundamental aspects of society and the state, considered from the point of view of ethics. WILDE.

129. MODERN POLITICAL THOUGHT. The state in modern political philosophy; its nature, basis, and authority. Individualism and socialism in the eighteenth and nineteenth centuries. The idea of democracy. WILDE.

[1] The three quarters of this course form a unit, but may be taken separately if desired.

135. THE PHILOSOPHY OF PLATO. The reading and discussion of the principal dialogs with a view to understanding the problem and method of Greek philosophy as illustrated in the writings of Plato. LODGE.

141. METAPHYSICS. A critical study of the fundamental metaphysical concepts, ontological and cosmological, that constitute the framework of reality. SWENSON.

147. ADVANCED LOGIC. Different topics from year to year, including the organization of the sciences, the presuppositions of knowledge, recent mathematical and symbolic logic, and the pragmatic theory of logic. (Not given in 1920-21.) LODGE.

151-152-153. KANT AND HIS SUCCESSORS. Modern currents of thought from the idealism of Fichte and Hegel, to the philosophy of evolution, pragmatism, and the new realism. LODGE.

161-162-163. SEMINAR IN PHILOSOPHY. Individual investigation in philosophy. Studies in either ancient or modern philosophy and ethics; critical and constructive studies of logic, metaphysics, or ethics. Character of work and general topic for year ascertained by consultation with department. WILDE.

PHYSICAL EDUCATION

FOR MEN

Professor LOUIS J. COOKE, Director; Assistant Professor WILLIAM K. FOSTER; Instructors CARL B. ROEMER, EDWIN S. BROWN, PERCY C. GLIDDEN; Assistants FRANK GILMAN, HARRY GOLDIE.

The purpose of the department is to provide all men of the University opportunity for exercise in order to maintain and build up their general health. It also provides special training for the correction of physical defects and functional derangements.

A physical examination is required of all new matriculants, and of all others using the department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate. Students taking the required work in physical education are examined at the close of the year. A study of these records shows a marked improvement in the standard of health of the average student during his college course.

The gymnasium, swimming-pool, and baths are open to all students of the University, who are free to use the apparatus and to pursue a course in physical training under the supervision of the director and his assistants.

Those students, taking the required course in physical education, who can not swim must make a reasonable effort, as determined by the department, to pass the swimming and life-saving requirements, and will be assigned special hours for instruction.

COURSES

1. PERSONAL HYGIENE. Two hours per week; first six weeks of each quarter. Examination at close of course. COOKE, FOSTER, BROWN.

2. GYMNASIUM AND SWIMMING. Two hours a week. Required qualification in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus. FOSTER, ROEMER, GLIDDEN.

3. ADVANCED LEADERS. Three hours a week. FOSTER, ROEMER.

4. CORRECTIVE GYMNASTICS. Three to six hours per week instead of regular gymnasium or military drill in case of physical disability. BROWN.

5-6-7-8-9. INTRAMURAL. ATHLETICS. Students who meet all the requirements of Course 2 and show special ability may elect these courses instead of Course 2. FOSTER, GILMAN, GOLDIE.

PHYSICAL EDUCATION

FOR WOMEN

Professor J. ANNA NORRIS, Chairman; Assistant Professor MAY S. KISSOCK;[1] Instructors GERTRUDE M. BAKER,[1] VALERIA G. LADD, GERTRUDE B. SCHILL, ALICE J. H. TOLG.

This department aims primarily to promote the health of the women students. It gives physical examination and advice to all on entrance; plans systematically to keep in close touch with them during their first two years in college; conducts yearly consultations with, and examines when necessary, all upper-class students; gives courses in hygiene; organizes physical work to meet the varying needs and physical tastes of students; coöperates closely with the Woman's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this department is required of all newly entering students (see Courses 1-2-3 and 11), of all sophomores (see "sophomore" courses; sophomores who can not swim must register for Course 43 on entrance), and of all students permitted, for reasons connected with their physical condition, to carry less than the minimum number of credit hours. Physical examinations or consultations are required annually of all students.

Elective classes are arranged in gymnastics, dancing, swimming, field-hockey, basket-ball, baseball, and other organized games.

For a special four-year professional course designed to prepare graduates for the responsible direction of physical education activities see bulletin of the College of Education. Students desiring to enter the course should consult with the head of this department. They should be without organic disease or serious functional disorder, should have a keen sense of rhythm, and should possess qualities of personality which will win the coöperation of others.

[1] Absent on leave, 1920-21.

Nine credits is the maximum number that can be gained by taking courses in exercise (Courses 54-55-56, 57-58-59); only one of these courses may be taken for credit in a quarter.

COURSES

1-2-3. ELEMENTARY PHYSICAL TRAINING. Lighter forms of gymnastics, orthopedic exercise, folk dancing, indoor and outdoor games. Study of daily habits of living. Shower bath fee, $2.50 per quarter. BARR, LADD, TOLG.

11. PRELIMINARY HYGIENE. One lecture a week. The most essential aspects of the care of the body. NORRIS.

13. PERSONAL HYGIENE. Care of the personal health; elements of anatomy and physiology. NORRIS.

19-20-21. RHYTHMIC EXPRESSION. A scientific, simple, joyous form of exercise with a definite system of technique based upon nature rhythms with the object of eliminating physical tension, self-consciousness, and repression. LADD.

22-23-24. SOPHOMORE RHYTHMIC EXPRESSION. Shower bath fee, $2.00 per quarter. LADD.

25-26-27. SOPHOMORE PHYSICAL TRAINING. Floor work, apparatus, and games. Orthopedic and remedial exercise for those not able to take regular class work. Shower bath fee, $2.00 per quarter. BARR, SCHILL.

31-32-33. FOLK DANCING AND ORGANIZED GAMES. Graded games and folk dances for the school and playground. Two hours a week.

34-35-36. HOCKEY, BASKET-BALL AND BASEBALL. Hockey in the autumn, basket-ball in winter, baseball in spring. Two hours a week. No registration necessary.

37. SOPHOMORE ORGANIZED GAMES. Suitable in strength for C-D girls. Conducted outdoors when weather permits. Shower bath fee, $2.00 per quarter. BARR.

38. SOPHOMORE FOLK DANCING. Twice a week. Shower bath fee, $2.00 per quarter. BARR.

39. SOPHOMORE ORGANIZED GAMES. See 37.

40. SOPHOMORE MAJOR SPORTS. Suitable in strength for A-B girls. Shower bath fee, $2.00 per quarter.

43. SOPHOMORE ELEMENTARY SWIMMING. For beginners. Shower bath fee, $2.00 per quarter.

44. SOPHOMORE ADVANCED SWIMMING. Shower bath fee, $2.00 per quarter.

45. GENERAL SWIMMING. For both beginners and advanced swimmers and divers. Shower bath tickets may be bought of the matron. No registration necessary.

54-55-56. INTERMEDIATE PHYSICAL TRAINING. Gymnastics, and an election of dancing or a sport. Daily habits of living, and written abstracts. If taken for no credit, no reading or written work will be required. Shower bath fee, $2.50 per quarter.

57-58-59. ADVANCED PHYSICAL TRAINING. Gymnastics, and an election of dancing or a sport. Written abstracts of prescribed reading. If taken without credit, no reading will be required. Shower bath fee, $2.50 per quarter. SCHILL.

64. HYGIENE OF THE FAMILY. Eugenics, prenatal care, maternity, puberty, sex education. NORRIS.

PHYSICS

Professors HENRY A. ERIKSON, Chairman; WILLIAM F. G. SWANN, JOHN T. TATE, ANTHONY ZELENY; Assistant Professor LARS WELO; Professorial Lecturer LOUALLEN F. MILLER; Instructors ARCHIE POWER, OSWALD ROGNLEY, JOSEPH VALASEK.

Major Advisers

Professors Erikson, Tate, and Zeleny.

Major Sequence

Courses 101, 103, 105, 102, 104, 106, and Mathematics 50, 51, and 52.

Courses 1, 2, 21, 22, 31, 32, 41, 42 comprise a general course in physics extending through four quarters. Those who intend to teach physics in secondary schools are advised to take Courses 101-103-105 and 102-104-106 in addition to the above general course. Those who intend to enter the field of industrial research are advised to take all of the intermediate courses in addition to the general course.

INTRODUCTORY COURSES

1. ELEMENTS OF MECHANICS AND SOUND. Mechanics of solids, fluids, wave motion, and sound. A study of the simpler fundamental principles. First part of a general Course 1, 21, 31, 41. Course 2 should be taken in conjunction with this course. Three lectures, one quiz hour a week. Three credits. ERIKSON.

2. ELEMENTS OF MECHANICS AND SOUND LABORATORY. Measurements in the mechanics of solids, fluids, wave motion, and sound; the laboratory part supplementing Course 1. One two-hour session in the laboratory a week. One credit. ERIKSON.

9. ACOUSTICS. A study of the principles of sound. A course designed primarily for the students in the Department of Music. Open also to other students. Three lectures a week. Three credits. ERIKSON.

21. HEAT. A study of the principles underlying heat phenomena. Course 22 should be taken in conjunction with this course. Three lectures, one quiz hour a week. Three credits. MILLER.

22. HEAT LABORATORY. The laboratory part supplementing Course 21. One two-hour session in the laboratory a week. One credit. MILLER.

31. OPTICS. A study of the principles underlying light phenomena. Course 32 should be taken in conjunction with this course. Three lectures, one quiz hour a week. Three credits. VALASEK.

32. OPTICS LABORATORY. The laboratory part supplementing Course 31. One two-hour session in the laboratory a week. One credit. VALASEK.

41. MAGNETISM AND ELECTRICITY. A study of the principles underlying magnetic and electric phenomena. Course 42 should be taken in conjunction with this course. Three lectures, one quiz hour a week. Three credits. ZELENY.

42. ELECTRICAL LABORATORY. The laboratory part supplementing Course 41. One two-hour session in the laboratory a week. One credit. ZELENY.

INTERMEDIATE COURSES

122. PYROMETRY AND HEAT. An experimental study of pyrometry, heat quantity, heat transfer, hygrometry, and gas liquefaction. One lecture, two three-hour sessions in the laboratory a week. Three credits. MILLER.

132. APPLIED OPTICS. Special experimental work in spectrometry, optical instruments, photometry, absorption, polarized light. Two three-hour laboratory periods a week. Three credits. ERIKSON.

142. ELECTRICAL MEASUREMENTS. Devoted mainly to the study of potentiometer methods, capacity, inductance, magnetic flux. Three two-hour laboratory periods a week. Three credits. ZELENY.

146. ELECTRICAL MEASUREMENTS OF PRECISION. Precision measurements of electromotive force, current, resistance, capacity, inductance, and magnetic flux. Use of apparatus of highest precision. Special problems. Three two-hour laboratory periods a week. Three credits. ZELENY.

145-147-148. RADIOACTIVITY. An analytical study of the theories, and methods of investigation supplemented by laboratory technique. Three credits. ERIKSON.

101-103-105. THEORETICAL PHYSICS. Intensive analytical survey of fundamental principles of mechanics, sound, heat, light, electricity, and magnetism, designed to supplement the general courses and to prepare students for more specialized graduate courses. Four lectures a week. Four credits. TATE.

102-104-106.[1] EXPERIMENTAL PHYSICS. A comprehensive course extending through the year, designed to familiarize students with fundamental and standard methods of precise measurements as exemplified by representative experiments in mechanics, sound, heat, light, and electricity. Three credits. TATE.

111-113-115. ELEMENTS OF MATHEMATICAL PHYSICS. A study of the fundamental principles and standard methods involved in the mathematical analysis of physical problems. Three lectures a week. Three credits. TATE.

112-114-116. ELEMENTARY PHYSICAL INVESTIGATION. The experimental or theoretical study of physical phenomena the nature or laws of which are not as yet understood. Three credits. ERIKSON, SWANN, TATE, ZELENY.

POLITICAL SCIENCE[2]

Professors CEPHAS D. ALLIN, Chairman; JEREMIAH S. YOUNG, ROY G. BLAKEY (Economics), NORMAN WILDE (Philosophy); Associate Professors ROBERT E. CUSHMAN, SOLON J. BUCK (History), ALVIN H. HANSEN (Economics); Assistant Professors WILLIAM ANDERSON, ALBERT J. LOBB, HAROLD S. QUIGLEY, QUINCY WRIGHT, LESTER B. SHIPPEE (History), MASON W. TYLER (History).

Major Advisers

Professors Allin and Young; Assistant Professor Anderson.

Major Sequences

The following sequences suggest distinct and specialized lines of work in political science. Other sequences conforming to the general regulations of the college will be arranged by the major advisers to meet the special needs of individual students.

Sequence A. American government. 151; 152 or 157 or 158; 111 or 141; 125 or 127; History 146-147; additional courses from the preceding list and the following to make 33 credits: 65, 145, 154, 155, 161, 175, 181, History 153, and Economics 154, 162, 176, 191-192, and 193.

Sequence B. Public law. 121; 151; 122 or 152; 155 or 157; 141; additional courses from the preceding list and the following to make 30 credits: 123, 145, 161, 167, 171, 175, and History 137-138 and 146-147.

Sequence C. Comparative government and political theory. 161; 165-166; 181; Economics 169; additional courses from the following list to make 33 credits: 129, 155, 167, 185, Economics 118-119-120, History 107-108, 109-110, and 137-138, and Sociology 140.

[1] This course may be begun any quarter and may be taken two years with credit.

[2] The courses in history and economics listed in the political science statement will be credited to the student as political science only with the approval of the chairman of the department and when taken in conjunction with political science courses.

Sequence D. Local government and administration. 111 or 141; 115; 117; 153 or 155; 171; 193; additional courses from the preceding list and the following to make 33 credits: 145, 175, Economics 154, 161, and 191-192, Education 124-125-126, History 144-145 and 153, and Sociology 55.

Sequence E. Diplomatic and consular service. 121-122; 125; Economics 176; additional courses from the following list to make 33 credits: 123, 127, 129, History 113-114-115, 104, 107-108, and 109-110, and Geology 117.

Sequence F. National and state administration. 111 or 141; 151; 157 or 158; 153 or 155; Economics 154; additional courses from the preceding list and the following to make 33 credits: 175, Economics 72, 161, 191-192, and 193, and History 113-114-115, 146-147, and 153.

Prerequisites: at least 10 credits in history and 15 credits in political science. In addition, the student is urged to take History 5-6 (American History), or 9-10 (Economic History), or Economics 3-4 (Principles of Economics). Students from other colleges and those who for any other reason are deficient in prerequisites may be required to make up their deficiencies in Junior College courses.)

Professional courses.—The attention of those who are preparing themselves for the public service is called to the special training courses outlined on pages 32-34 of the bulletin. Further information may be had from the chairman of the department.

Bureau for Research in Government.—This bureau is organized to conduct and direct special investigations into practical politics and administrative problems, national, state, and local. Mr. Anderson will act as director, but all members of the staff will take part in the work of the bureau. Advanced and graduate students are strongly urged to take advantage of its facilities.

BEGINNING COURSE

1. AMERICAN GOVERNMENT. Origin and nature of the American governmental system; organization and actual workings of the national government to-day.

INTERMEDIATE COURSES

3. COMPARATIVE EUROPEAN GOVERNMENT. The governments and politics of the great European powers of to-day. QUIGLEY, WRIGHT.

7. STATE AND LOCAL GOVERNMENT. A comparative study of American state governments. The adoption and amendment of constitutions; organization, powers, and methods of the three departments; problems of administrative reorganization. CUSHMAN, LOBB.

11. MUNICIPAL GOVERNMENT. The growth of cities in the United States. The evolution of the council, mayor, commission, and city manager forms of government; their relative merits. Popular control. Municipal functions. Departmental organization and civil service. ANDERSON.

15. INTRODUCTION TO POLITICAL SCIENCE. Introductory presentation of the problem of government. The nature of the state, the forms and functions of government, the principles of politics. QUIGLEY.

21. COLONIAL GOVERNMENT. Ancient and modern colonization; principles of government and methods of administration in the chief French, Dutch, English, and American colonies and dependencies. (Not offered in 1920-21.) ALLIN.

25. WORLD POLITICS. A study of the foreign policies and international relations of the leading European powers to-day. TYLER, QUIGLEY.

31. POLITICAL PARTIES. The nature and functions of political parties in modern democratic states. Organization and methods of parties; legal control of parties and elections; public opinion as a factor in popular government. (Not offered in 1920-21.) LOBB.

ADVANCED COURSES

41. INTRODUCTION TO THE STUDY OF LAW. The distinction between customs, morals, and laws; the origin of common law principles; equity; legal rights and remedies. For pre-legal students. LOBB.

51-2-3. BUSINESS LAW. Principles governing ordinary business transactions. Contracts—formation, operation, interpretation, breach, and discharge. Agency and service. Negotiable instruments. Business associations—partnerships and private corporations. Property—personal and real. YOUNG.

58. ELEMENTARY LAW. Legal principles governing the family and personal relations; judicial decisions regarding social and economic problems; the administration of justice from the standpoint of the citizen. LOBB.

65. CONTEMPORARY POLITICAL PROBLEMS. Parliamentary government; reorganization of our state governments; administrative centralization; government by commission; electoral, ballot, budgetary, and civil service reforms; proportional representation; initiative, referendum, and recall; responsibilities of citizenship. YOUNG.

107-108. EUROPE, 1848-1914. The development of Europe in its various phases—political, social, and economic—from the Revolution of 1848 to the outbreak of the war of 1914. A reading knowledge of French or German will be helpful. Identical with History 107-108. TYLER.

109-110. ENGLISH HISTORY, 1815-1920. Assigned readings and lectures. Emphasis placed upon party history, the colonies, foreign relations, the social-democratic movement, and especially British foreign policy preceding the Great War. Identical with History 109-110. (Not offered in 1920-21.)

111. GOVERNMENT OF MINNESOTA. The development and present organization of the state government; its relation to the local governments;

the growth of the state constitution; present problems and proposed changes. LOBB.

115. MUNICIPAL PROBLEMS. A specialized course in modern legal, administrative, and functional problems of cities. The content of the course will change from year to year, keeping abreast of municipal progress. ANDERSON.

117. MUNICIPAL ENGINEERING. Development of municipal public works. City-planning, transportation, and housing. Principles of public health and sanitation. Public water supplies, sewerage and sewage disposals, refuse collection and disposal, the sanitation of buildings. Identical with Civil Engineering 53.3. BASS.

121. INTERNATIONAL LAW: PEACE. Nature, sources, and sanction of international law. Recognition, intervention, insurgency, jurisdiction, and the protection of citizens will be considered with especial attention to diplomatic and consular practice. Emphasis upon the application of principles to concrete cases. WRIGHT.

122. INTERNATIONAL LAW: WAR AND NEUTRALITY. Rules of war on land and sea, military necessity and retaliation. The obligations of neutral states and the law of prize. Especial attention to practice during the recent war. WRIGHT.

123. DEVELOPMENT OF INTERNATIONAL LAW AND ORGANIZATION. The classics in international law, systems of international relations, international administrative organizations, and leagues of nations. WRIGHT.

125. AMERICAN DIPLOMATIC HISTORY. Attention to the principles and policies guiding American diplomacy in its stages of development as well as to the methods pursued and the personalities of American diplomats. WRIGHT.

127. AMERICAN FOREIGN RELATIONS. Such topics as the Monroe Doctrine, freedom of the seas, the "open door," arbitration, and disarmament, will be considered with particular reference to the future policy of the United States. WRIGHT.

129. FAR EASTERN POLITICS. The principal factors in the social and political life of Japan and China; their relations with each other and with western powers. QUIGLEY.

141. STATE CONSTITUTIONAL LAW. The bill of rights; limitations upon legislative and executive powers; taxation; control of state trust funds; political rights; amendments to the constitution. LOBB.

145. LEGISLATIVE POWER AND METHODS. Source and scope of the legislative power; methods used by legislative bodies; current political questions; formulation and defense of legislative bills. YOUNG.

146-147. CONSTITUTIONAL HISTORY OF THE UNITED STATES. A study of the evolution of American constitutional government through legislation, judicial interpretation, administrative rule and custom. Primarily for pre-legal students but open to other students in the College of Science, Literature, and the Arts who have had 15 credits or 10 credits in history and 5 in political science. Identical with History 146-147. SHIPPEE.

151. CONSTITUTIONAL LAW: THE AMERICAN FEDERAL SYSTEM. Judicial interpretation of the constitution; power of judicial review; separation of governmental powers; relation of state and national governments; construction of national powers; jurisdiction of courts. CUSHMAN.

152. CONSTITUTIONAL LAW: FUNDAMENTAL RIGHTS AND IMMUNITIES. Privileges and immunities of citizenship; protection of civil and political rights; the obligation of contracts; due process of law and equal protection of the law.

153. THE WEST IN AMERICAN POLITICS SINCE 1865. An intensive study of independent parties and radical or progressive political movements. Prerequisite, 20 credits in history including 5-6. Identical with History 153. (Not given in 1920-21.) BUCK.

154. NATIONAL AND STATE ADMINISTRATION. The principles of American administrative organization and the operation of administrative departments, and of important administrative boards and commissions. (Not offered in 1920-21.) YOUNG.

155. COMPARATIVE ADMINISTRATIVE LAW. Administration as a science; origin and development; analysis of the administrative systems of the United States, England, France, and Germany, with special reference to the law of officers, the merit system, and special administrative tribunals. (Not offered in 1920-21.) YOUNG.

157. POLICE POWER. Nature of the police power; constitutional aspects of social and economic legislation, including safety, order, morals, and protection against business fraud and oppression; the fundamental rights under the police power. (Not offered in 1920-21.) YOUNG.

158. GOVERNMENT AND BUSINESS. Governmental powers; laissez-faire versus regulation; protection against fraud and oppression; restraint of trade and manipulation of prices; protection of debtors; business affected with a public interest; qualified property; compulsory benefits; conservation of natural wealth; vested rights; confiscatory legislation; administration of business legislation; reaction of war emergency measures on permanent policy. YOUNG.

161. COMPARATIVE FEDERAL GOVERNMENT. Ancient and modern federal unions, especially the constitutions of the United States, Switzerland,

Canada and Australia, the South African Union, and the proposals for British imperial federation. ALLIN.

165-6. GOVERNMENT OF THE BRITISH EMPIRE. Law and custom of the British constitution. ALLIN.

167. BRITISH POLITICS. Parties, party leaders and policies. The relation of English and imperial politics. ALLIN.

169. THE LABOR AND SOCIALIST MOVEMENT IN EUROPE. A theoretical analysis and historical survey of utopian socialism, Marxian socialism, evolutionary socialism, anarchism, syndicalism, sovietism, guild socialism, state socialism, coöperation and labor parties, especially as found in Germany, France, England, and Russia. Identical with Economics 169. HANSEN.

171. MUNICIPAL CORPORATIONS. The legal basis of municipal government; the relation of the city to the state; home rule. The city as a legal entity; its powers, duties and liability for torts. ANDERSON.

175. LAW OF LABOR. Constitutional aspects of laws for the protection of labor; regulation of hours and wages; legal restraints on labor; legality of strikes; boycotts, picketing, etc. Legal aspects of settlement of labor disputes. CUSHMAN.

181. MODERN POLITICAL THOUGHT. Same as Philosophy 129. The state in modern political philosophy, its nature, basis, and authority. Individualism and socialism in the eighteenth and nineteenth centuries. The idea of democracy. WILDE.

185. POLITICAL AND SOCIAL ETHICS. Same as Philosophy 124. The fundamental aspects of society and the state, considered from the point of view of ethics. WILDE.

191-192. PUBLIC FINANCE. National government revenues, expenditures, and debts. Includes the principles and various forms of taxation, budgetary legislation and control, war and emergency financiering, the shifting and incidence of taxes and fiscal reforms. Identical with Economics 191-192. BLAKEY.

193. STATE AND LOCAL TAXATION. Principles and problems, e.g., state and local taxation of lands, mineral resources, forests, corporations, incomes, inheritances; also studies of classification, separation, local option, exemption, double taxation, evasion, assessment, centralized administration. Identical with Economics 193. BLAKEY.

NOTE: For graduate courses open to properly qualified seniors, consult the chairman of the department.

PSYCHOLOGY

Associate Professors RICHARD M. ELLIOTT, Chairman; WILLIAM S. FOSTER, HERBERT WOODROW;[1] Assistant Professors MABEL R. FERNALD, KARL S. LASHLEY, JOHN J. B. MORGAN; Instructors FRANCES E. LOWELL, PAUL T. YOUNG.

Major Advisers

Associate Professor Elliott; Assistant Professor Fernald.

Major Sequences

Sequence A. General psychology. 101-102-103; 125-126; 108-109; and any one of 114-115, 119-120, 127-128, and 144-145.

Sequence B. Human and animal behavior. 119-120; 114-115; 121; 144-145; Animal Biology 109-110.

Sequence C. Differential psychology. 101-102-103; 125-126; any one of 127-128, 131-132, and 144-145; Educational Psychology 134-135.

(Prerequisites for all sequences: 1-2-3, 4-5-6.)

COURSES

1-2†-3. GENERAL PSYCHOLOGY. An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences. Two lectures, one recitation per week. ELLIOTT and others.

4-5†-6. INTRODUCTORY LABORATORY PSYCHOLOGY. Simple experiments providing the beginner illustrative material and training in the methods of laboratory psychology. Required for all advanced courses in psychology, except 8, 156, and 160. Two laboratory hours per week. FOSTER and others.

8. APPLICATIONS OF PSYCHOLOGY TO BUSINESS. An introduction to business psychology. Business and pre-business students only. MORGAN.

101-102-103†. EXPERIMENTAL PSYCHOLOGY. Experimentation in the analysis and measurement of mental phenomena. Assigned reading and reports on special topics. One lecture, four laboratory hours per week. FERNALD and others.

108-109†. ADVANCED GENERAL PSYCHOLOGY. A systematic presentation of the laws of the normal adult mind, based upon study of experimental results. Lectures, recitations, and reports.

114-115†. HUMAN BEHAVIOR. An analysis from the point of view of the objective school of psychologists. ELLIOTT.

119-120†. ANIMAL BEHAVIOR. The development of reaction-systems in animals, with emphasis upon the application of studies of animals to the solution of general problems in physiological psychology. One lecture, six laboratory hours per week. LASHLEY.

[1] Absent on leave, 1920-21.

121. NEURO-PSYCHOLOGY. Specialization of functions in the nervous system in relation to behavior. Discussion from the standpoint of psychology of current theories of integration and localization. Two lectures, three laboratory hours per week. LASHLEY.

125-126†. DIFFERENTIAL PSYCHOLOGY. Important distinguishing characteristics (psychological) of individuals and groups. Emphasis on experimental and statistical methods of discovering differences and of making comparisons. Each student participates in investigation of definite problems and in analysis of results. FERNALD.

127-128†. SOCIAL PSYCHOLOGY. Study of the dependence of familiar forms of social organization and behavior upon the fundamental laws of mental activity. The adjustment of the innate mental equipment of the individual to the norms of social groups.

131-132†. CHILD MIND. General intelligence and special mental abilities; their development and their relation to heredity, physiological factors, education, speech defects, and delinquency. LOWELL.

144-145†. ABNORMAL PSYCHOLOGY. A systematic review of psychopathology in relation to normal behavior. LASHLEY.

156. PSYCHOLOGY OF ADVERTISING. Psychology as applied to advertising. Psychological analysis of advertisements followed by experimental investigation of the value in advertising of such factors as interest, attention, suggestion, and memory. MORGAN.

160 EMPLOYMENT PSYCHOLOGY. Psychology as applied to employment problems. Standardization of the personal interview; the principles and development of test methods; personnel classification methods. Independent investigations required of each student. MORGAN.

NOTE: For graduate courses open to properly qualified seniors, consult the chairman of the department.

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

Professor MELVIN E. HAGGERTY, Chairman; Assistant Professors HERMIONE L. DEALEY, MARVIN J. VAN WAGENEN.

COURSES

45. ELEMENTARY EDUCATIONAL PSYCHOLOGY. A survey of fundamental facts of human behavior involved in educational activities. Open to seniors, juniors, and qualified students in third quarter of sophomore year upon advice of Professor Haggerty. HAGGERTY, DEALEY.

106-107-108. ADVANCED EDUCATIONAL PSYCHOLOGY. Genetic psychology, origin and nature of human organism, development and control of

instincts; their relation to group activities. Measuring rate of learning; typical learning experiments, conditions of the most economic learning. Group and individual differences; their relations to educational practice. VAN WAGENEN.

111. EDUCATIONAL DIAGNOSIS. The typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure based on the results of the test. VAN WAGENEN.

126-127. METHODS OF EDUCATIONAL RESEARCH. A study of statistical and other methods as applied to educational investigation. This course is ordinarily required of all candidates for advanced degrees. VAN WAGENEN.

128. REVIEW OF STATISTICAL STUDIES. A survey of statistical studies in education with special reference to the methods employed and the reliability of the results obtained. VAN WAGENEN.

134-135-136. MENTAL TESTS AND MENTAL DIAGNOSIS. Study of mental variation in children, its nature, degrees, causes, and effects. A laboratory course in the study of individual differences by means of mental tests. Methods of treating superior and subnormal children in schools. HAGGERTY, DEALEY.

138-139. EXPERIMENTAL EDUCATION. A laboratory course designed to train students in the use of experimental methods in the study of educational problems, particularly in the field of the psychology of learning. HAGGERTY, VAN WAGENEN.

149-150-151. PSYCHO-EDUCATIONAL CLINIC. Conducted in coöperation with the Department of Sociology and the Medical School clinics in pediatrics and nervous and mental diseases. Students will receive systematic instruction in giving psychological examinations and in scientific interpretation of data. HAGGERTY, DEALEY.

153-154-155. RESEARCH PROBLEMS. Intended for properly prepared students who desire to pursue special investigation in the field of educational psychology. HAGGERTY, VAN WAGENEN.

156. PSYCHOLOGY OF VOCATIONAL EDUCATION. A practical course covering psychological facts and principles involved in vocational education, and in industrial and commercial administration. Attention is given to matters of personnel, acquisition of skill, motivation of workers, and efficiency of administration. DEALEY, HAGGERTY.

ROMANCE LANGUAGES

Professors EVERETT W. OLMSTED, Head; COLBERT SEARLES, IRVILLE C. LECOMPTE; Associate Professors RALPH E. HOUSE, RUTH S. PHELPS; Assistant Professors FRANCIS B. BARTON, JULES T. FRELIN, PEDRO

HENRÍQUEZ UREÑA, EDWARD H. SIRICH; Professorial Lecturer ANTONIO HERAS; Instructors JOSEPHINE DE BOER, CHARLES B. DRAKE, SOLOMON M. DELSON, MARGUERITE GUINOTTE, GUSTAVE VAN ROOSBROECK, SAMUEL VASCONCELOS; Teaching Fellow CAMILA HENRÍQUEZ UREÑA.

Major Advisers

Professors Olmsted, Searles, and LeCompte; Associate Professors House and Phelps.

Major Sequences

Major sequences consist of from 27 to 36 credits in Senior College courses offered by the department. Courses within the sequences must be progressive and the arrangement thereof must have the approval of the department. In special cases certain approved courses of allied departments may be included in these sequences. Specimen approved sequences are posted on the departmental bulletin at 200 Folwell Hall.

Requirements of the department.—For Bachelor of Arts with Honors, general requirements: a reading knowledge of Latin or German with two years work in Spanish or Italian, if French is the major subject, or two years work in French or Italian, if Spanish is the major subject.

In the junior year, Courses 56-57-58, 59-60-61, 80-81-82; and 115-116-117, if French is the major subject; and Courses 56-57-58, 59-60-61, 65-66-67, and 80-81-82, if Spanish is the major subject. In the senior year, Courses 100-101-102, 103-104-105, 118-119-120, and 153-154-155 or any other two-hour advanced course, if French is the major subject; or Courses 100-101-102, 103-104-105, 115-116-117, and 159-160-161, or any other two-hour advanced course, if Spanish is the major subject. Substitution may be made for these courses with the approval of the department. Alternation of courses required in the junior and senior years is allowable.

Certificate of aptitude.—The department grants a certificate of aptitude to those students who have completed in a satisfactory manner certain prescribed courses destined to fit them for teaching French or Spanish in secondary schools. For details, consult bulletin at Room 200 Folwell Hall.

For sequences of Junior College courses.—See departmental bulletin at Room 200 Folwell Hall.

Courses in French or Spanish conversation.—May be taken only when accompanied by the corresponding courses in composition. No credit will be given for work done in a course in conversation unless the course in composition is passed also. Courses in composition may be taken separately.

Prerequisites for teachers' courses.—In addition to Course 21-22-23 (or Spanish equivalent, Course 65-66-67) one conversation-composition course and one literary course.

Admission to advanced courses.—No student will be allowed to elect courses more advanced than intermediate French or Spanish, who has not received a grade of C or better in the intermediate courses.

Combined Junior College courses.—French 21-22-23 or French 80-81-82 may be combined with French 50-51-52 and French 53-54-55 or French 56-57-58 and French 59-60-61 to form five-hour unit courses for Junior College students. In like manner Spanish 65-66-67 or 80-81-82 may be combined with Spanish 50-51-52 and 53-54-55 or 56-57-58 and 59-60-61.

Freshmen entering with three years of high-school French will take Course 20. If they take additional work in the department, they will elect Course 24-25. In like manner, students entering with three years high-school Spanish will register for Course Spanish 20, and, if they take additional work in the department, for Spanish 68-69.

Pre-medical students may satisfy the language requirement of the Medical School by completing any two quarters of French 8-9-10, or, if they have completed French 3 or equivalent, by passing a special reading examination. Such examinations will be given the second Saturday of each quarter.

FRENCH

1-2†. BEGINNING FRENCH. Pronunciation, grammar, oral exercises, translation.

3-4. INTERMEDIATE FRENCH. First quarter: review of grammar, connected prose composition, reading of representative authors. Second quarter; prose composition, conversation, informational readings on contemporary France.

5-6-7†. BEGINNING FRENCH. (Architects only.) Pronunciation, grammar, translation.

8-9-10. SCIENTIFIC FRENCH. (Pre-medical students.) Readings from general works on scientific subjects.

11-12-13†. FRENCH EDUCATION, JOURNALISM, AND COMMERCE. A practical course intended to give a general view of French thought and institutions. (Not offered in 1920-21.)

14-15-16†. FRENCH COMMERCIAL CORRESPONDENCE. (Not offered in 1920-21.)

20. ORAL AND WRITTEN FRENCH. Practical French conversation and composition.

21-22-23†. SURVEY OF FRENCH LITERATURE. This course will give in outline the history of French literature from 1600 to the present. Representative texts will be read. SEARLES, PHELPS, VAN ROOSBROECK.

24-25†. SURVEY OF FRENCH LITERATURE. Same as 21-22-23, except that it is a five-hour course extending through two quarters.

50-51-52†. FRENCH CONVERSATION. FRELIN, GUINOTTE.

53-54-55†. FRENCH COMPOSITION. FRELIN, GUINOTTE.

56-57-58†. ADVANCED FRENCH CONVERSATION. BARTON, SIRICH.

59-60-61†. ADVANCED FRENCH COMPOSITION. BARTON, SIRICH.

62-63-64†. PRACTICAL FRENCH PHONETICS. Drill in pronunciation. Recitation of passages in prose and verse. Exercises on the phonograph. DELSON.

80-81-82†. FRENCH LITERATURE: NINETEENTH CENTURY. A study of the romantic and realistic movements as manifested in the novel, drama, and poetry. Assigned texts and collateral reading. The course is conducted entirely in French. BARTON, DELSON.

100-101-102†. DICTION FRANÇAISE. Dissertations litteraires par le discours. Leçons sur des textes en prose et en vers. Exercises oraux de diction, de syntaxe et de vocabulaire. DELSON.

103-104-105†. FRENCH SYNTAX AND COMPOSITION. Special studies in characteristic problems of French syntax. BARTON.

106. ADVANCED FRENCH PHONETICS. Practical study of the pronunciation in French: the sounds, the stress group, the connected phrase. Oral and phonograph practice in enunciation based upon reading of texts representing various literary types. DELSON.

115-116-117†. FRENCH LITERATURE: SEVENTEENTH CENTURY. Influence of the literary salons. Development of French prose. Perfection of French dramatic art by Corneille, Racine, and Molière. Reading, discussions, reports based upon collateral reading. SEARLES.

118-119-120†. FRENCH LITERATURE: EIGHTEENTH CENTURY. Philosophic movement: Bayle, Fontenelle, Montesquieu, Voltaire, L'Encyclopedie, Rousseau. Literature: poetry, tragedy, comedy, novel. Reading, discussions, reports based upon collateral reading. OLMSTED.

121-122-123†. FRENCH LITERATURE: SIXTEENTH CENTURY. Forerunners of the Renaissance: Marot and L'Ecole Lyonnaise. The Renaissance movement and the Reformation, Rabelais, Calvin and the Pleiade and its successors; Montaigne; the situation at the close of the century. SIRICH.

141-142-143†. REALISTIC NOVEL: NINETEENTH CENTURY. A study of realism with especial reference to the novel. Flaubert, Maupassant, Zola, etc. Alternates with 159-160-161. LECOMPTE.

150-151-152†. FRENCH DRAMATIC LITERATURE. A study of the development of dramatic literature in France from the classical period to the present time. Alternates with 153-154-155. OLMSTED.

153-154-155†. FRENCH LYRIC POETRY. Principles of French prosody. A study of the evolution of French lyric poetry. Alternates with 150-151-152. (Not offered in 1920-21.) OLMSTED.

156-157-158†. FRENCH CLASSICISM. The development of French classic ideals and doctrines. The humanistic element, the reform of Malherbe, the adoption of the Aristotelian doctrines. French classic writers. Alternates with 162-163-164. (Not offered in 1920-21.) SEARLES.

159-160-161†. FRENCH CRITICISM. A study of the masters of French criticism. Alternates with 141-142-143. (Not offered in 1920-21.) LECOMPTE.

162-163-164†. FRENCH LITERARY CRAFTSMANSHIP. A study of the methods followed by modern French authors. Alternates with 156-157-158. SEARLES.

171-172-173†. EXPLICATION DE TEXTES. An analytical and critical study of French texts, in which particular attention is given to style, thought, and diction. The course is conducted in French.

174-175-176†. LECTURES IN FRENCH. Subject to be announced. VAN ROOSBROECK.

177-178-179†. ADVANCED LECTURES IN FRENCH. (Not offered in 1920-21.)

191-192-193†. RESEARCH METHODS AND MATERIAL.

SPANISH

1-2†. BEGINNING SPANISH. Pronunciation, grammar, oral exercises and translation.

3-4. INTERMEDIATE SPANISH. First quarter: review of grammar, connected prose composition, reading of representative authors. Second quarter: conversation, general correspondence, informational readings on South America or Spain.

20. ORAL AND WRITTEN SPANISH. Practical Spanish conversation and composition. DRAKE.

50-51-52†. SPANISH CONVERSATION. HERAS.

53-54-55†. SPANISH COMPOSITION. HERAS.

56-57-58†. ADVANCED SPANISH CONVERSATION. VASCONCELOS.

59-60-61†. ADVANCED SPANISH COMPOSITION. VASCONCELOS.

62-63-64†. PRACTICAL SPANISH PHONETICS. Drill in pronunciation. Recitation of passages in prose and verse. (Not offered in 1920-21.)

65-66-67†. SURVEY OF SPANISH LITERATURE. An outline of the history of Spanish literature from 1500 to the present day, based upon texts and collateral reading. HOUSE.

68-69†. SURVEY OF SPANISH LITERATURE. Same as above, except that it is a five-hour course extending through two quarters. DRAKE.

70-71-72†. SOUTH AMERICAN LIFE AND INSTITUTIONS. A practical course intended to give a general view of South American ideals and institutions. Lectures and assigned readings. VASCONCELOS.

73-74-75†. SPANISH COMMERCIAL CORRESPONDENCE. VASCONCELOS.

80-81-82†. SPANISH LITERATURE: NINETEENTH CENTURY. A study of the principal literary movements. Assigned texts and collateral reading. Lectures in Spanish. HERAS.

83-84-85†. SOUTH AMERICAN LITERATURE. An outline of South American literary history. Reading of representative authors. Lectures in Spanish. (Not offered in 1920-21.) VASCONCELOS.

100-101-102†. SPANISH ORAL DICTION. Oral dissertations on assigned subjects. Exercises in diction, syntax and vocabulary. HERAS.

103-104-105†. SPANISH SYNTAX. Special studies in characteristic problems of Spanish syntax. HOUSE.

115-116-117†. SPANISH LITERATURE: GOLDEN AGE. A study of the principal literary movements from 1550 to 1681 with particular emphasis on the age of Lope de Vega. Assigned texts, collateral reading, lectures in Spanish. HENRÍQUEZ.

141-142-143†. SPANISH NOVEL. The development of Spanish fiction from the picaresque novel to that of the present day. Alternates with 159-160-161. (Not offered in 1920-21.) HENRÍQUEZ.

150-151-152†. SPANISH DRAMATIC LITERATURE. A general survey of Spanish dramatic literature with special attention to the Golden Age. Alternates with 156-157-158. HOUSE.

156-157-158†. CRITICAL STUDY OF SELECTED SPANISH CLASSICS. Intensive reading of texts: and study of literary influences. Alternates with 150-151-152. (Not offered in 1920-21.) HOUSE.

159-160-161†. CERVANTES. A study of his life and works. Attention will be centered upon *Don Quixote* and the *Novelas Exemplares*. Alternates with 141-142-143. HENRÍQUEZ.

174-175-176†. LECTURES IN SPANISH. Subject to be announced. HENRÍQUEZ.

177-178-179†. ADVANCED LECTURES IN SPANISH. (Not offered in 1920-21.) HENRÍQUEZ.

ITALIAN

1-2†. BEGINNING ITALIAN. Pronunciation, grammar, oral exercises, translation. PHELPS.

80. SURVEY OF ITALIAN LITERATURE: RENAISSANCE PERIOD. Alternates with 81. (Not offered in 1920-21.) PHELPS.

81. SURVEY OF ITALIAN LITERATURE: ROMANTIC PERIOD. Alternates with 80. PHELPS.

153-154-155†. ITALIAN LYRICS. A study of the development of lyric poetry in Italy. Reading of representative authors. PHELPS.

159-160-161†. DANTE, PETRARCH, BOCCACCIO. An introduction to their works. The three cantiche of the *Divina Commedia* are read, one each year in rotation, together with a number of the canqoni, and sonnets of Petrarch, and portions of the *Decameron*. PHELPS.

162-163-164†. DANTE IN ENGLISH. Lectures: reading and discussion of the *New Life,* and two cantiche of the *Divine Comedy* not read in 159-160-161. Private reading of one other work. PHELPS.

SCANDINAVIAN

Professors GISLE C. J. BOTHNE, Chairman; ANDREW A. STOMBERG.

COURSES

1-2. BEGINNING NORWEGIAN. Grammar, composition, select readings in easy prose and poetry.

3. INTERMEDIATE NORWEGIAN. Grammar, composition, conversation, elementary history of literature, and select works of modern authors.

4-5. ADVANCED NORWEGIAN (SURVEY). Prose and poetry. BOTHNE.

7-8. BEGINNING SWEDISH. Grammar, composition, conversation, reading of selected prose texts. STOMBERG.

9. INTERMEDIATE SWEDISH. Reading selected works in prose and verse. STOMBERG.

10-11. ADVANCED SWEDISH (SURVEY). Brief survey of the history of Swedish literature, reading of Tegner's *Fritjéofs Saga,* Runeberg's *Fänrik Stålks Sägner,* and selected texts in Swedish history. STOMBERG.

12. ANCIENT AND MEDIEVAL SCANDINAVIAN HISTORY. The antiquities of Scandinavian formation of states, the Viking expeditions, medieval culture. Knowledge of Scandinavian not required. STOMBERG.

101-102-103. MODERN NORWEGIAN LITERATURE. Norwegian literature from 1814 to the present day. BOTHNE.

104-105-106. MODERN SCANDINAVIAN HISTORY. Religious, political, and economic changes in the North, military enterprises, growth of liberalism, material progress. Knowledge of Scandinavian not required. STOMBERG.

107-108-109. MODERN SWEDISH LITERATURE. The Swedish novel. Study of a selected list of Swedish classics. STOMBERG.

110. IBSEN. Lectures, reading, and interpretation. BOTHNE.

111-112-113. OLD NORSE (ICELANDIC). Grammar, and reading. Gunnlaug's *Saga Ormstungu*. BOTHNE.

114. STRINDBERG. Lectures, reading, and interpretation. STOMBERG.

117. EARLY NORWEGIAN LITERATURE. History of literature. Saga period. Norwegian and Danish folk-songs. Holberg, Oplysningstiden. BOTHNE.

130-131-132. DANISH LITERATURE OF THE NINETEENTH CENTURY. From Oehlenschläger to the end of the century. BOTHNE.

134-135. THE LANDSMAAL MOVEMENT AND LITERATURE. From Aasen to Garborg. BOTHNE.

136. BJÖRNSON. A study of his activity as a central figure in modern Norway. BOTHNE.

SOCIOLOGY AND SOCIAL WORK

Professors ARTHUR J. TODD,[1] Chairman; FRANK J. BRUNO, Acting Chairman; Associate Professors LUTHER L. BERNARD, MANUEL C. ELMER; Assistant Professors ROSS L. FINNEY, GUSTAV A. LUNDQUIST; Lecturers OTTO W. DAVIS, WILLIAM W. HODSON, ARTHUR H. TAYLOR, EDWARD C. WAITE; Instructors LOUIS A. BOETTIGER, CHARLES E. LIVELY; Teaching Fellow ANDREW N. WRAY; Supervisors of Field Work MILDRED D. MUDGETT, MARION TEBBETS.

Major Advisers

Lecturer Bruno; Associate Professors Bernard and Elmer.

Major Sequences

Sequence A. Social theory. 51; 52; 53; 100; 101; 102; 119; 120; 140.

Sequence B. Rural sociology. 51; 52; 53; 55 or 60; 100; 101, 102, or 120; 110 or 114; 122; 123 or 119; 130.

Sequence C. Rural social work. 51; 52; 60; 110; 114; 122; 128; Agricultural Education 54 and 161; Political Science 157 or 158; Public Health (Medical School) 107.

Sequence D. Medical social service. 51; 52; 53; 60; Psychology 125-126 or 144-145; Pathology and Public Health (Medical School) 107; Bacteriology and Immunology 1; Sociology 97-98-99; 133 or 138-139.

[1] Absent on leave, 1920-21.

Sequence E. General social service. 51; 52; 53 or 60; 55; 119; 122; 128; 130; 132 (for those who take 53) or 61 (for those who take 60); Political Science 58.

(Prerequisites: The following courses are recommended as the groundwork for a major in sociology: Sociology 1, and 6 or 14; Economics 3-4; Psychology 1-2-3; Political Science 1; Animal Biology 1-2.)

COURSES

1. INTRODUCTION TO SOCIOLOGY. A study of the origin and development of human societies; various agencies which have determined the type of social life; social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. BERNARD, ELMER, FINNEY, LUNDQUIST, LIVELY, BOETTIGER, WRAY.

3. EDUCATIONAL SOCIOLOGY. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations. FINNEY.

6. MODERN SOCIAL REFORM MOVEMENTS. A survey of attempts to overcome certain social maladjustments: child labor, the city, bad housing, poverty, degeneracy; movements for public health, industrial democracy, social insurance, protection of infancy and youth, public recreation, etc. ELMER, FINNEY, BOETTIGER, LIVELY.

14. RURAL SOCIOLOGY. The background and evolution of country life; rural conveniences, communication, coöperation; rural social institutions, especially the family, school, church, and social center; rural leadership, surveys, organization, social agencies. BERNARD, LUNDQUIST, LIVELY.

45-46. ELEMENTS OF SOCIAL HYGIENE AND COMMUNITY PROTECTIVE WORK. (Not offered in 1920-21.)

51. THE BACKGROUND OF DEPENDENCY AND DEFECTIVENESS. This course considers the conditions in contemporary industrial societies out of which the social problems of the dependent and defective arise. BRUNO.

52. TREATMENT OF DEPENDENTS AND DEFECTIVES. This course reviews the methods used or advocated for the prevention and alleviation of poverty and defectiveness, with special emphasis upon the method of family case work. BRUNO.

53. TREATMENT OF DELINQUENTS. The causes of crime; nature of the criminal; criminal procedure; methods of treatment (prisons, reformatories, parole, probation); the juvenile offender; juvenile courts; preventive methods. ELMER.

55. HOUSING PROBLEMS. An examination of housing evils and their causes; the various movements for the prevention or improvement of bad housing; town- and city-planning; garden cities. Lectures, readings, field work, and essays. DAVIS.

60. CHILD WELFARE. Study of social obligations to the child; development of the child-saving movement in the United States; infant and child mortality, recreation, education; courts, institutions, societies, and other public efforts for the child. HODSON.

61. LEGAL PROTECTION OF THE CHILD. A study of the relation of law to child welfare. A survey of existing children's protective legislation, of its administration and its future development. HODSON.

97-98-99. SUPERVISED FIELD PRACTICE WORK. This is a course in technique open to such students as wish to strengthen their experience in case work. MUDGETT, TEBBETS.

100. SOCIAL PSYCHOLOGY. (Primarily for sociology students.) The social attitudes; their development and modification under social pressures; the interactions of individuals and groups. BERNARD.

101. SOCIAL ORGANIZATION. The organization and structure of social groups; the selection of group types and values; the disorganization and reorganization of institutions; purposive social organization. BERNARD.

102. SOCIAL CONTROL. Nature, purpose, and methods of social control; institutional and non-institutional controls; the evolution of sanctions in social control; the revision of the social controls under the influence of modern science. BERNARD.

103. SOCIOLOGY OF CONFLICT. (Not offered in 1920-21.)

104. STATE CARE OF DEPENDENTS, DEFECTIVES, AND DELINQUENTS IN MINNESOTA. (Not offered in 1920-21.)

110. METHODS OF COMMUNITY ORGANIZATION AND SOCIAL WORK IN SMALL TOWNS AND COUNTRY. Concrete problems and methods are emphasized. BERNARD.

114. RURAL SOCIAL INSTITUTIONS. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. For advanced students. Lectures, discussion, reports. LUNDQUIST.

119. THE FAMILY. The evolution of the family; its various forms and their relation to other social institutions; the service of the family in social evolution; contemporary problems of the family (standards of living, birth rate, feminism, etc.). ELMER.

120. SOCIAL PROGRESS. A study of the basis for social progress in human nature; analysis of fundamental social institutions with regard to their contributions to human advance; necessary social readjustments to convert drift into progress. BERNARD.

122. METHODS OF SOCIAL INVESTIGATION. Methods of gathering and presenting community facts; social statistics; social surveys. Lectures, problems, and field work. ELMER.

123. SOCIAL STATISTICS. This course is a study and analysis of social statistics and their bearing upon group life. The course is especially designed to give social workers and public health officials the training necessary to carry on their work successfully. ELMER.

125-126-127. SETTLEMENT AND COMMUNITY CENTER WORK. (Not offered in 1920-21.)

128. CHARITABLE ADMINISTRATION, FINANCE, AND PUBLICITY. A technical study of methods of organizing charitable agencies, of financing them, and of making the public aware of their work. Lectures and practice work. DAVIS.

130. TECHNIQUE OF FAMILY TREATMENT. An intensive study of social case work as the basis of practical dealing with problems of dependency and defectiveness. Lectures and conferences. BRUNO.

132. JUVENILE COURTS AND PROBATION. Primarily a course in probation practice work, but prefaced by lectures on the social and legal aspects of the juvenile court and probation. WAITE, BRUNO.

133. MEDICAL SOCIAL SERVICE. A course open only to students who are properly grounded in case work and who wish to specialize in this field.

138-139. MENTAL CASE WORK. A study of mental abnormality and its treatment through case work. Lectures and clinical instruction.

140. HISTORY OF SOCIAL THEORY. A rapid survey of the leading social theories from the time of the Greeks, with special reference to the development of sociology in the nineteenth century. The theories are related to their social background. BERNARD.

141. CONTEMPORARY SOCIAL THEORY. An intensive study of selected types of social theory of the present, open to students who have taken Course 140. BERNARD.

150. SEMINAR. Subject for fall quarter: the literature of social protest. Open to qualified students in either English or Sociology. (Not offered in 1920-21.) TODD.

151. SEMINAR. Subject for winter quarter: social aspects of the labor problem. (Not offered in 1920-21.) TODD.

152. SEMINAR. Subject for spring quarter: Problems of institutional administration and reconstruction. (Not offered in 1920-21.) TODD.

180-181-182. SEMINAR IN EDUCATIONAL SOCIOLOGY. Problems in the social aspects of educational theory and practice. FINNEY.

Allied courses in other departments.—Agricultural Education 173; Anthropology 5, 113, 125; Economics 161, 167; Education 3; Home Economics 40, 70, 71, 72; Philosophy 124-125; Political Science 11, 58, 157.

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

TABULAR STATEMENT AND PROGRAM OF COURSES

1920-1921

ANIMAL BIOLOGY

No.	Title	Credits	Offered to	Prerequisite courses
1-2†	General Zoology	10	All	None
5-6-7†	General Zoology (for pre-medical students)	12	Pre-medical	None
9-10†	Histology	10	Soph., jr., sr.	1-2
11	General Histology.....	5	Fr.,soph.,jr.,sr.	1-2
17-18†	General Physiology.....	10	Soph., jr., sr.	15 credits in an. biol. or 10 cr. in an. biol. and 10 cr. in chem. or physics
23	Morphogenesis and Behavior of Organisms	5	Fr.,soph.,jr.,sr.	Same as for 17-18
37-38-39†	Gen. Entomology.....	9	Soph., jr., sr.	1-2
43	Introduct. Entomology.....	5	Fr.,soph.,jr.,sr.	1-2
44	Animal Parasites.....	5	Soph., jr., sr.	1-2
45-46†	Ornithology	6	Soph., jr., sr.	1-2
47	General Ecology.....	5	Fr.,soph.,jr.,sr.	1-2
75	Nature Study.....	3	Jr.	Histology, embryol.
102	Morphol. Invertebrates.....	3	Jr., sr.	1-2 and 5 other cr. in an. biol.
107	Protozoology	3	Jr., sr., grad.	1-2 and 5 other cr. in an. biol.
109-110†	General Physiology.....	10	Jr., sr., grad.	20 cr. in an. biol.
117-118-119†	Ecology of Insects.....	9	Jr., sr., grad.	1-2 and 43
124	Advanced Ecology.....	5	Jr., sr., grad.	117-118-119
125-126-127†	Advanced Entomology.....	9	Jr., sr., grad.	1-2; 37-38, and 43
130	Biology Aphididae.....	3	Jr., sr., grad.	1-2 and 10 additional cr. in an. biol.
139-140†	Histol. and Development of Insects	6	Jr., sr., grad.	1-2 and 37, 38 or 43
144-145-146†	Animal Parasites and Parasitism	9	Jr., sr., grad.	1-2 and 37-38 or 43
149-150-151†	Blood of Vertebrates.....	9	Sr., grad.	Histology and embryology, reading knowledge of French & German
153-154-155†	Hematology	9	Jr., sr., grad.	Histol., embryol.
181-182†	Embryology	6	Jr., sr., grad.	1-2 and 11
183	Genetics and Eugenics.....	3	Jr., sr., grad.	1-2, 11, 181-182
197-198-199	Problems	9 or 18	Sr., grad.	1-2 and special requirements

† The entire course must be completed before credit is received for any quarter.

ANIMAL BIOLOGY

No.	Title		Hour	Day	Building	Instructor
1f-2w†	General Zoology.....					
	Sec. I	Lab.	III, IV	MWF	101AB	Ar
		Lect.	III, IV	T		
			III	ThS	313AB	Ar
	Sec. II	Lab.	V, VI, VII	TTh	101AB	Ar
		Lect.	V	MW		
			V, VI	F	313AB	Ar
	Sec. III	Lab.	V, VI	MWF	101AB	Ar
		Lect.	V, VI	TTh	313AB	Ar
1w-2s†	General Zoology.....					
		Lab.	I, II	MWF	101AB	Ar
		Lect.	I, II	T		
			II	ThS	313AB	Ar
1s-2su or 2w†	General Zoology.....					
		Lab.	V-VI-VII	TTh	101AB	Ar
		Lect.	V	MW		
			V-VI	F	313AB	Ar
5f-6w-7s†	General Zoology					
	(Pre-medical)	Lab.	III, IV	TS	101AB	Ar
		Lect.	IV	MWF	313AB	Ar
5f-6w-7s†	General Zoology					
	(Pre-dental)	Lab.	I, II	TS	101AB	Ar
		Lect.	I	MWF	313AB	Ar
9f-10w†	Histology		III, IV	MTWThF	201, 211AB	Downey
11s	General Histology.....		III, IV	MTWThF	201, 211AB	Nachtrieb
17f-18w†	General Physiology.....		V, VI, VII	MW		
			V, VI, VII, VIII	F	10AB	Lund
23s	Morphogenesis and Behavior of Organisms.....		V, VI, VII	MW		
			V, VI, VII, VIII	F	10AB	Lund
37f-38w-39s†	General Entomology.....		I, II	MWF	208-10AB	Oestlund
43s	Introd. Entomology.....		I, II	MTWThF	208-10AB	Oestlund
44f	Animal Parasites.....		V, VI	MWF	208-10AB	Riley
44s	Animal Parasites.....		V, VI, VII	WF	208-10AB	Riley
45w-46s	Ornithology		V, VI, VII	TTh	211, 314AB	Roberts
47s	General Ecology		V, VI, VII	TTh	208-10AB	Chapman
75s	Nature Study.....		V, VI, VII	TTh	213AB	Sigerfoos
102w	Morphology of Invertebrates		I, II	TThS	211, 213AB	Sigerfoos
107s	Protozoology		I, II	TThS	211, 213AB	Sigerfoos
109f-110w†	General Physiology.....		V, VI, VII	MW	10AB	Lund
			V, VI, VII, VIII	F		
117f-118w-119s†	Ecology of Insects.....		V, VI, VII	TTh	208-10AB	Chapman
124su	Advanced Ecology.....		V, VI	MTWThF	208-10AB	Chapman
125f-126w-127s†	Advanced Entomology....		III, IV	TThS	208-10AB	Oestlund
130w	Biology Aphididae.....		III, IV	MWF	208-10AB	Oestlund
139s-140w†	Hist'l. Development Insects		III, IV	MWF	208-10AB	Riley
144f-145w-146s†	Animal Parasites and Parasitism		V, VI, VII	WF	208-10AB	Riley
149f-150w-151s†	Blood of Vertebrates....		VI, VII	Ar	201, 211AB	Downey
153f-154w-155s†	Hematology		V, VI, VII	TTh	201, 211AB	Downey
181f-182w†	Embryology		V, VI	MWF	201, 211AB	Nachtrieb
183s	Genetics and Eugenics....		III	MWF	211AB	Nachtrieb
197f-198w-199s	Problems		Ar	Ar	Ar	Ar

† The entire course must be completed before credit is received for any quarter.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Credits	Offered to	Prerequisite courses
1	Introductory Entomology ...	5	Soph., jr., sr.	An. biol. 10 cr.
2	Economic Entomology.....	5	Soph., jr., sr.	1
3	Elem. Economic Entomology.	3	Soph., jr., sr.	An. biol. 10 cr.
4	Economic Vert. Zoology.....	3	Jr., sr.	An. biol. 10 cr.
12	Forest Zoology	3	Jr., sr.	An. biol. 10 cr.
16	Plant Pest Control.....	3	Jr., sr.	1 and 2 or 3, or Pl. Path. 1
150	Insecticides and Their Action	3 or 6	Jr., sr.	37-38-39 or Agr. Biochem. 7-8, or the equivalent
197	Introd. to Research.....	5 or more	Sr.	1-2 or 37-38-39 and other work as prescribed by division

ANTHROPOLOGY AND AMERICANIZATION TRAINING

No.	Title	Credits	Offered to	Prerequisite courses
1	Introduction to Anthropology	5	3d qu. fr., soph., jr., sr.	None
2	General Anthropology	3	Soph., jr., sr.	1
[4	Cultural Anthropology.....	3	Soph., jr., sr.	1]
5	General Immigration	3	Soph., jr., sr.	1
12	Ethnology	3	Soph., jr., sr.	1
57-58-59	Race Leaders and Programs.	9	Jr., sr.	Three courses
60	Slavic Culture	2	Jr., sr.	114
61-62§	Slavic Oral Language.....	4	Jr., sr.	60
70‡	Food Preparation.....	3	Soph., jr., sr.	An. Biol. 1-2
71‡	Elementary Dietetics.....	3	Soph., jr., sr.	70, Physiol. 3, or parallel
72	Home Management Problems	3	Jr., sr.	71, Econ. 7, or parallel
[108	Philippine Peoples	3	Jr., sr., grad.	Two courses]
[110	Physical Anthropology and Amalgamation	3	Jr., sr., grad.	1, and An. Bi. 1-2]
[112	The American Negro.....	3	Jr., sr., grad.	Two courses]
113	The Older Immigrants.....	3	Jr., sr., grad.	Three courses
114	The Newer Immigrants.....	3	Jr., sr., grad.	Three courses
115	Americanisms and Assimilation	3	Jr., sr., grad.	Three courses
[117	The Immigrant Woman.....	3	Jr., sr., grad.	Three courses]
[118	Government and the Immigrant	3	Jr., sr., grad.	5, or 10 cred. in pol. sci.]
123-124	Problems in Anthropology..	6	Jr., sr., grad.	Three courses
128	Technique of Teaching Adults	3	Jr., sr., grad.	Three courses
129	Methods of Americanization.	3	Jr., sr., grad.	128
130	Organization of Americanization Work	3	Jr., sr., grad.	128
131-132-133	Supervised Americanization Work	9	Jr., sr., grad.	128

‡ Does not count as a Senior College course.

§ Open only to students specializing in americanization work.

[ ] Not offered in 1920-21.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Building	Instructor
1f,s,su	Introductory Entomology.	V, VI	M-F	208, 210AB	Oestlund, Riley
2w,su	Economic Entomology....	V, VI	M-F	306Adm(F)	Ruggles
3f	Elementary Econ. Entom.	V, VI, VII	TTh	306Adm(F)	Ruggles
4f	Economic Vert. Zoology..	Ar	Ar	Ar	Washburn
12w	Forest Zoology.....	Ar	Ar	Ar	Washburn
16s	Plant Pest Control.....	Ar	Ar	Ar	Washburn
150f,su	Insecticides and Their Action	Ar	Ar	Ar	Moore
197f,w,s,su	Introduction to Research.	Ar	Ar	Ar	Oestlund, Ruggles, Chapman, Moore, Riley, Washburn

ANTHROPOLOGY AND AMERICANIZATION TRAINING

No.	Title	Hour	Day	Building	Instructor
1f	Introduction to Anthropol.	I	TWThFS	15F	Grace
		II	MWThFS	15F	Jenks
		V	MTWThF	15F	Junek
1w	Introduction to Anthropol.	I	TWThFS	15F	Grace
		V	MTWThF	15F	Junek
1s	Introduction to Anthropol.	II	MWThFS	15F	Grace
2f	General Anthropology....	II	MWF	25F	Grace
2w	General Anthropology....	II	MWF	25F	Jenks
2s	General Anthropology....	I	MWF	15F	Grace
5w	General Immigration.....	III	TThS	15F	Grace
5s	General Immigration.....	II	TThS	25F	Junek
12s	Ethnology	II	MWF	25F	Jenks
57f-58w-59s	Race Leaders & Programs	I	TThS	25F	Ar
60f	Slavic Culture.....	IV	TS	25F	Junek
61w-62s	Slavic Oral Language....	IV	TS	25F	Junek
70w	Food Preparation	V-VI	MWF	HE	Lindquist
71s	Dietetics	V-VI	MWF	HE	Mumford
72f	Home Management Prob..	V-VI	MWF	HE	Lindquist
113f	The Older Immigrants....	III	MWF	25F	Jenks
114w	The Newer Immigrants..	III	MWF	25F	Jenks
115s	Americanisms and Assimilation	III	MWF	25F	Jenks
123f-124w	Prob. in Anthropology...	V-VII	M	25F	Jenks
128f	Tech. of Teaching Adults	I	MWF	25F	Junek
129w	Meth. of Americanization.	I	MWF	25F	Jenks, Junek
130s	Org. of Americanization.	I	MWF	25F	Jenks, Junek
131f-132w-133s	Supervised Amer. Work..	VI	T and Ar	25F	Junek

ARCHITECTURE

No.	Title	Credits	Offered to	Prerequisite courses
4-5†-6	Elements of Arch.	15	Soph.	Soph. standing
10-11-12†	Freehand Drawing	6	Soph.	Soph. standing
15-16†-17	Arch. Design, Elem.....	12	Soph.	4-5-6
21-22-23†	Specifications and Working Drawings	9	Soph.	4-5-6
51-52-53†	Freehand Drawing	9	Jr.	10-11-12
55-56-57	Arch. Design, Intermed.....	18	Jr., arch.	15-16-17
61-62-63†	Freehand Drawing.....	9	Sr.	51-52-53
65-66	Materials of Construction...	4	Sr.	Sr. standing
71-72-73†	Arch. Design, Advanced....	18	Sr.	55-56-57
81	Business Practice	2	Sr.	Sr. standing
82	Landscape Design	2	Sr.	Sr. standing
83	Decoration and Allied Arts.	2	Sr.	Sr. standing
85-86-87†	Architectural Hist. (Ancient and Renaissance)	6	Jr.	4-5-6
88-89-90†	Arch. Hist. (Med. & Modern)	6	Sr.	85-86-87
91	Hist. of Sculpt. & Painting..	2	Sr.	Sr. standing

ASTRONOMY

No.	Title	Credits	Offered to	Prerequisite courses
4-5‡	Introduction to Astronomy..	10	3d qu. fr., soph., jr., sr.	Trigonometry
7	Navigation	3	Soph., jr., sr.	Trigonometry
11§	Descriptive Astronomy.....	5	3d qu. fr., soph., jr., sr.	None
25§	Stellar Astronomy.....	5	Soph., jr., sr.	11
51-52-53	General Astronomy.....	9	Jr., sr.	Math. 1, 6, 7, or phys. sci. and Math. 6
62	Elements of Practical Astron.	3	Jr., sr.	Astr. 4 or 11 or 51 and Math. 6, 7
101-102-103	Practical Astronomy	9 or 18	Jr., sr., grad.	Astr. 4 or 11 or 51 and Math. 50
111-112-113	Celestial Mechanics.....	9	Sr., grad.	Math. 51
140	Method of Least Squares...	3	Jr., sr., grad.	Math. 51

BACTERIOLOGY AND IMMUNOLOGY

No.	Title	Credits	Offered to	Prerequisite courses
1	General Bacteriology	5	Soph.	Chemistry 10 cr.
101	Special Bacteriology for Medical Students	4	Jr., sr.	1
103	Special Bacteriology for Students of Agriculture..	4	Jr., sr.	1
105	Household Bacteriology	3	Jr., sr.	1
114	Higher Bacteria	3	Jr., sr.	101, or 103
116	Immunity	3	Jr., sr.	101, or 103
117	Pathogenic Protozoa	3	Jr., sr.	101, or 103
118	Morphology and Taxonomy of Bacteria	3	Jr., sr.	101, or 103
119-120	Bacteriological Chemistry ...	4	Jr., sr.	101, or 103, Physiology 100-101-102 or Agr. Biochem. 111-112.
150-151	Advanced Bacteriology	3	Jr., sr.	See instructor

† The entire course must be completed before credit is received for any quarter.
‡ Satisfies the Junior College requirement for science under the new curriculum.
§ Does not satisfy the Junior College requirement for science under the new

ARCHITECTURE

No.	Title	Hour	Day	Building	Instructor
10f-11w-12s	Freehand Drawing	V, VI	MWF	401ME	Burton, Johnson
4f-5w-6s	Elements of Architecture.	II	W	317ME	Forsythe
		V, VI	MWF		Burton
		V, VI, VII	TTh		Prudden
		III, IV	S		

ASTRONOMY

No.	Title	Hour	Day	Building	Instructor
4f-5w	Introduction to Astronomy	I	TWThFS	124F	Beal
4w-5s	Introduction to Astronomy	VI	MTWThF	124F	Beal
4s-5f	Introduction to Astronomy	I	TWThFS	124F	Beal
7f	Navigation	VI	MWF	124F	Leavenworth
11f	Descriptive Astronomy...	III	MTThFS	124F	Leavenworth
11w	Descriptive Astronomy...	IV	MTWFS	124F	Beal
11s	Descriptive Astronomy...	III	MTThFS	124F	Leavenworth
25f	Stellar Astronomy.....	IV	MTWFS	124F	Beal
25w	Stellar Astronomy.....	III	MTThFS	124F	Leavenworth
25s	Stellar Astronomy.....	IV	MTWFS	124F	Beal
51f-52w-53s	General Astronomy.....	II	MWF	124F	Leavenworth
62f	Elements of Practical Astronomy	II	TThS	124F	Beal
62s	Elem. of Pract. Astronomy	II	TThS	124F	Beal
101f-102w-103s	Practical Astronomy.....	Ar	Ar	Ar	Leavenworth
111f-112w-113s	Celestial Mechanics.....	Ar	Ar	123F	Beal
140w,s	Method of Least Squares.	IV	MWF	123F	Leavenworth

BACTERIOLOGY AND IMMUNOLOGY

No.	Title	Hour	Day	Building	Instructor
1f-w-s-su	General Bacteriology.....	V, VI, VII	MWF	MH	Ar
101f-su	Special Bacteriology for Medical Students.... .	I, II	MWF	MH	Ar
103w	Special Bacteriology for Students of Agriculture	I, II	TThS	MH	Ar
105f	Household Bact.....	VI, VII	TTh	MH	Ar
114s	Higher Bacteria.....	VI, VII	TTh	MH	Ar
116w	Immunity	VI, VII	TTh	MH	Ar
117s	Pathogenic Protozoa.....	VI, VII	TTh	MH	Ar
118f	Morphology and Taxonomy of Bact.....	VI, VII	TTh	MH	Ar
119f-120w	Bacteriological Chemistry.	V, VI, VII	TTh	MH	Ar
150f-151w or 150w-151s	Advanced Bacteriology...	VI, VII	TTh	MH	Ar

BOTANY

No.	Title	Credits	Offered to	Prerequisite courses
1-2†§	General Botany	10	All	None
7	Taxon. of Flowering Plants.	5	All	2
11	Algae and Fungi	5	Soph., jr., sr.	2
15	Anat. of Vasc. Plants	5	Soph., jr., sr.	2
51	Histol. Methods	3	Jr., sr.	15 cr.
52	Plant Physiology	5	Jr., sr.	15 cr.
53	Botany of Econ. Plants	5	Jr., sr.	15 cr.
54	Elementary Ecology	5	Jr., sr.	15 cr.
62	Bryophytes and Pteridophytes	5	Jr., sr.	15 cr.
63	Gymnosperms & Angiosperms	5	Jr., sr.	7 or 62
105	Algae	5	Jr., sr., grad.	15 cr.
[107	Bryophytes	5	Sr., grad.	7 and 62]
108	Pteridophytes	5	Sr., grad.	7 and 62
[110	Gymnosperms	5	Sr., grad.	7 and 63]
113-114-115	Advanced Taxonomy	9	Jr., sr., grad.	7
118-119†	Cytology	6	Jr., sr., grad.	51
123	Algae: Blue-green	3	Jr., sr., grad.	105
124	Algae: Green	3	Jr., sr., grad.	105
125	Algae: Brown	3	Jr., sr., grad.	105
126	Algae: Red	3	Jr., sr., grad.	105
131	Field Ecology	5	Sr., grad.	54
132	Ecological Anatomy	5	Sr., grad.	54
133	Forest Geog. of N. A.	5	Sr., grad.	54
141	Physical Phases of Plant Physiology	5	Sr., grad.	52 and gen. org. chem.
142	Plant Metabolism	5	Sr., grad.	52 and gen. org. chem.
143	Plant Metabolism & Growth.	5	Sr., grad.	52 and gen. org. chem.

† The entire course must be completed before credit is received for any quarter.

§ Students entering with high-school botany may elect 2 without 1. See departmental statement.

[ ] Not offered in 1920-21.

BOTANY

No.	Title		Hour	Day	Building	Instructor
1f-2w†§	General Botany.....					Durand in charge
	Sec. I	Lab.	I, II	MWF	212-214-220P	
		Quiz	I	T	212-214-220P	
		Lect.	II	TThS	210P	
	Sec. II	Lab.	III, IV	MWF	212-214-220P	
		Quiz	III	Th	212-214-220P	
		Lect.	III	T	210P	
			III, IV	S	210P	
	Sec. III	Lab.	V, VI	MWF	212-214-220P	
		Quiz	V	Th	212-214-220P	
		Lect.	V, VI	T	210P	
			VI	Th	210P	
1s-(2f)†§	General Botany.....					Durand in charge
		Lab.	III, IV	MWF	212-214P	
		Quiz	III	T	212-214P	
		Lect.	IV	T	210P	
			III, IV	S	210P	
(1s)-2f†§	General Botany					
		Lab.	V, VI, VII	TTh	212-214P	
		Quiz	VI	W	212-214P	
		Lect.	V	MWF	210P	
7s	Taxonomy of Flowering Plants					Rosendahl in charge
		Lab.	V, VI	MWF	212-214P	
		Quiz	V	Th	210P	
		Lect.	VI	TTh	210P	
11f	Algae and Fungi.....		I, II	TWThFS	10AB	Tilden
15w	Anat. of Vascular Plants.		III, IV	MTWFS	202AB	Butters
51f	Histological Methods.....		I, II	MWF	202AB	Rosendahl
52f	Plant Physiology.....		III, IV	MTWFS	G	Knight
53w	Botany of Econ. Plants..		III, IV	MTWFS	G	Knight
54s	Elementary Ecology.....		III, IV	MTWFS	G	Cooper
62w	Bryophytes and Pteridophytes		I, II	TWThFS	202AB	Huff
63s	Gymnosperms and Angiosperms		I, II	TWThFS	202AB	Butters
105f	Algae		III, IV	MTWFS	10AB	Tilden
105s	Algae		I, II	MTWFS	10AB	Tilden
108w	Pteridophytes		Ar	Ar	Ar	Butters
113f-114w-115s	Advanced Taxonomy.....		V, VI	MWF	202AB	Rosendahl
118w-119s†	Cytology		I, II	MWF	202AB	Rosendahl
123f	Algae: Blue-green.....		V, VI, VII	TTh	104AB	Tilden
124w	Algae: Green.....		V, VI, VII	TTh	104AB	Tilden
125s	Algae: Brown		V, VI, VII	TTh	104AB	Tilden
126w	Algae: Red		V, VI, VII	WF	104AB	Tilden
131f	Field Ecology.....		V, VI, VII	TTh	G	Cooper
			I, II, III	S		
132w	Ecological Anatomy.....		III, IV	MTWFS	G	Cooper
133s	Forest Geography of North America.....		V-VI	MWF	G	Cooper
141f	Physical Phases of Plant Physiology		I, II	TWThFS	G	Knight
142w	Plant Metabolism and Growth		I, II	TWThFS	G	Knight
143s	Plant Metabolism and Growth		I, II	TWThFS	G	Knight

† The entire course must be completed before credit is received for any quarter.
§ Students entering with approved high-school botany may elect 2 without 1.

PLANT PATHOLOGY AND BOTANY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1	Plant Pathology	5	Jr., sr.	Bot. 10 cred.
6	Plant Pest Control	3	Jr., sr.	1, Ent. 3
7-8	Weeds and Grasses	6	Soph., jr., sr.	Bot. 10 cred.
9	Weeds and Seed-Testing	3	Soph., jr., sr.	Bot. 10 cred.
10	Forest Pathology	5	Soph., jr., sr.	Bot. 10 cred.
12	Seed Problems	3	Jr., sr.	9
14	Plant Disease Control	5	Jr., sr.	1, Ent. 1 or 3
	Advanced Courses			
105-106-107	Mycology	9	Jr., sr.	Bot. 7, 11 or equiv.
108-109	Methods	6	Jr., sr.	1, Bact. 1
110	Principles of Pathology	3	Jr., sr.	1, Bact. 1
111	Diseases of Field Crops	3	Jr., sr.	1
112	Diseases of Fruit and Vegetable Crops	3	Jr., sr.	1

CHEMISTRY

SCHOOL OF CHEMISTRY

Division of General Inorganic Chemistry

No.	Title	Credits	Offered to	Prerequisite courses
1-2-3†	Gen. Inorg. Chem. (for pre-medical students)	12	Pre-dents. and pre-med. only	None
4-5†	Gen. Inorg. Chem. (for pre-medical students)	8	Pre-dents. and pre-med. only	Entrance cr. in chem.
6-7†-8	Gen. Inorg. Chem.	15	Those entering without chem.	None
9-10†	Gen. Inorg. Chem.	10	All	Entrance cr. in chem.
11	Qual. Chem. Anal. (for pre-medical students)	4	Pre-med. and pre-dents. only	3 or 5
12-13†	Qual. Chem. Anal.	10	All	8 or 10

† The entire course must be completed before credit is received for any quarter.

PLANT PATHOLOGY AND BOTANY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Building	Instructor
1f	Plant Pathology	V, VI, VII, VIII	MWF	1, 2PP	Freeman, Stakman, Bisby
6s	Plant Pest Control.....	V, VI, VII	TTh	1, 2PP	Stakman, Bisby, Puttick
7w-8s	Weeds and Grasses I....	V, VI, VII	TTh	3PP	Dahlberg
9f	Weeds and Seed-Testing.	V, VI, VII	TTh	3, 4PP	Dahlberg, Larson
10s	Forest Pathology	Ar	Ar	Ar	Dahlberg
12w	Seed Problems.....	Ar	Ar	Ar	Ar
14s	Plant Disease Control....	Ar	Ar	Ar	Freeman
105f-106w-107s	Mycology	III, IV	MWF	1, 32PP	Stakman, Bisby
108f-109w	Methods	I, II	MWF	1, 30PP	Stakman, Bisby
110s	Principles of Pathology..	I, II	MWF	1, 30PP	Stakman
111w	Diseases of Field Crops..	V, VI	MWF	1, 2PP	Stakman
112s	Diseases of Fruit and Vegetable Crops	V, VI	MWF	1, 2PP	Bisby, Puttick

CHEMISTRY

SCHOOL OF CHEMISTRY

Division of General and Inorganic Chemistry

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s†	Gen. Inorg. Chem. (for pre-med. and pre-dent.)				
	Lect.	V	MWF	100C	Ar
	Lab.	V, VI or	TTh	210C	Ar
		VII, VIII	TTh	210C	Ar
4f-5w†	Gen. Inorg. Chem. (for pre-med. and pre-dent.)				
	Lect.	V	MWF	325, 225C	Ar
	Lab.	V, VI or	TTh	210C	Ar
		VII, VIII	TTh	210C	Ar
6f-7w†-8s†	Gen. Inorg. Chem.....				
	Lect.	II	MWF	225C	Cohen
	Lab.	I, II, III	ThS	210C	Cohen & assts.
9f-10w†	Gen. Inorg. Chem.....				
	Lect.	II	MWF	100C	Sneed
	Lab.	I, II, III	ThS	210C	Sneed & assts.
11f	Qual. Chem. Analysis (for pre-med. and pre-dent.)				
	Lect.	IV	MWF	325C	Cohen
	Lab.	V, VI	MW	210C	Cohen & assts.
11s	Gen. Inorg. Chem. (for pre-med. and pre-dent.)				
	Lect.	V	MWF	325, 225C	Ar
	Lab.	V, VI or	TTh	210C	Ar
		VII, VIII	TTh	210C	Ar
12s-(13f)†	Qual. Chem. Analysis....				
	Lect.	II	MWF	100C	Sneed
	Lab.	I, II, III	ThS	210C	Sneed & assts.
(12s)-13f†	Qual. Chem. Analysis....				
	Lect.	II	TThS	325C	Sneed
	Lab.	V, VI, VII	MW	210C	Sneed & assts.

† The entire course must be completed before credit is received for any quarter.

No.	Title	Credits	Offered to	Prerequisite courses
101	Hist. of Chemistry.....	2	Sr., grad.	35-36
102	Adv. Qual. Chem.....	2	Jr., sr., grad.	21-36
103	Adv. Inorg. Chem.....	2	Jr., sr., grad.	21-36
104	Adv. Inorg. Chem	2	Jr., sr., grad.	21, 36

Division of Analytical Chemistry

No.	Title	Credits	Offered to	Prerequisite courses
20	Quant. Anal. (for pre-med. students)	4	Pre-med. only	11
20	Quant. Anal.	5	Soph., jr., sr.	12-13
21	Quant. Anal.	5	Soph., jr., sr.	20
123	Iron and Steel Anal.....	3	Jr., sr., grad.	21
124	Mineral and Ore Anal.....	3	Jr., sr., grad.	21
125	Spec. Prob. in Quant. Anal..	2 or 3	Jr., sr., grad.	21
126	Sanitary Water Anal.....	1 or 2	Jr., sr., grad.	21

Division of Organic Chemistry

No.	Title	Credits	Offered to	Prerequisite courses
31-32†	Elm. Org. Chem.....	8	Pre-medics	11
35-36†	Organic Chemistry.....	10	Jr., sr.	15 cr. in college chem.
131	Adv. Organic Chemistry.....	3	Jr., sr., grad.	35-36
132	Adv. Organic Chemistry.....	3	Jr., sr., grad.	131
137-138‡	Adv. Organic Chem. Lab...	Ar	Jr., sr., grad.	35-36
139‡	Adv. Organic Chem. Lab....	Ar	Jr., sr., grad.	137-138

† The entire course must be completed before credit is received for any quarter.

‡ Open only to those who are taking or have taken a lecture course in Advanced Organic Chemistry.

No.	Title	Hour	Day	Building	Instructor
101s	History of Chemistry....	Ar	Ar	Ar	Cohen
102w	Adv. Qual. Chem. Anal..	Ar	Ar	Ar	Sneed
103s	Adv. Inorg. Chem.....				
	Lect.	II	TThS	315C	Sneed
104w	Adv. Inorg. Chem.....	Ar	Ar	Ar	Cohen

Division of Analytical Chemistry

No.	Title	Hour	Day	Building	Instructor
20f	Quant. Anal. (for pre-medical students).....				
	Lect.	VI	M	325C	Sidener
	Lab.	VII, VIII	M	310C	Sidener, Geiger
		V-VIII	WF	310C	Sidener, Geiger
20w-21s	Quant. Analysis.....				
	Lect.	V	M	325C	Geiger
	Rec.	V	F	315C	Geiger
	Lab.	VI-VIII	MF	310C	Sidener, Geiger
		V-VIII	W	310C	Sidener, Geiger
123f	Iron and Steel Analysis..				
	Lect.	V	T	315C	Sidener
	Lab.	VI-VIII	T	310C	Sidener, Geiger
		V-VIII	Th	310C	Sidener, Geiger
124w	Mineral and Ore Analysis				
	Lect.	V	T	315C	Sidener
	Lab.	VI-VIII	T	310C	Sidener, Geiger
		V-VIII	Th	310C	Sidener, Geiger
125s	Spec. Prob. in Quant. Analysis				
	Lect.	V	Th	315C	Sidener
	Lab.	V-VIII	T	310C	Sidener, Geiger
	Lab.	VI-VIII	Th	310C	Sidener, Geiger
126s	San. Water Analysis.....				
	Lect.	V	T	315C	Sidener
	Lab.	VI-VII	T	310C	Sidener, Geiger
	Lab.	V-VII	Th	310C	Sidener, Geiger

Division of Organic Chemistry

No.	Title	Hour	Day	Building	Instructor
31w-32s†	Elem. Organic Chemistry.				
	Lect.	IV	MWF	325C	Hunter
	Lab.	V-VII	TTh or WF	10C	Hunter, Woollett
35f-36w†	Organic Chemistry.....				
	Lect.	III	MWF	100C	Hunter
	Lab.	V-VII	TTh or WF	10C	Hunter, Woollett
131s	Adv. Organic Chemistry.				
	Lect.	III	MWF	325C	Hunter
132f	Adv. Organic Chemistry.				
	Lect.	III	TThS	325C	Hunter
137-138‡	Adv. Organic Lab. (taken any quarter)	Ar	Ar	331C	Hunter
139‡	Adv. Organic Lab.....	Ar	Ar	331C	Hunter

† The entire course must be completed before credit is received for any quarter.

‡ Open only to those who have taken or are taking a lecture course in advanced organic chemistry.

Division of Physical Chemistry

No.	Title	Credits	Offered to	Prerequisite courses
140-141†-142	Physical Chemistry	9, 12 or 15	Jr., sr., grad.	2 yrs. col. chem. 1 yr. col. phys.
[143-144-145	Thermo-Dynamics and Chem.	9	Sr., grad.	140-141]
146-147-148	Kinetic Theory & Atomistics	9	Sr., grad.	140-141-142 and Calculus
149	Prin. of Colloidal Chem....	2	Sr., grad.	140-141
[150	Applications of Colloidal Chemistry	2	Sr., grad.	140-141]
151	Radiochemistry	2	Sr., grad.	140-141
152	Radiochemistry Lab.	1	Sr., grad.	To accompany 151
153-154-155	Adv. Physical Chem. Lab...	Ar	Sr., grad.	140-141-142
159-160	Physical Chem. Seminar....	2	Sr., grad.	See statement of course

AGRICULTURAL BIOCHEMISTRY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
7-8	General Agricultural Biochemistry	10	Soph., jr., sr.	Chem. 10 cred.
15	Principles of Animal Nutrition	3	Soph., jr., sr.	7-8 or org. chem.
	Advanced Courses			
101-102	Agricultural Quantitative Analysis	6	Jr., sr.	7-8 or quant. anal. and org. chem.
103	Dairy Chemistry	5	Jr., sr.	7-8 or org. chem.
108	Chemistry of Wheat and Wheat Products.....	3	Jr., sr.	7-8 or org. chem.
110	Flour Laboratory Methods..	5	Jr., sr.	101-102, or Chem. 131-132, parallel 108
111-112	Phytochemistry	6	Sr.	Biol. 10 cred., org. chem.
113-114	Biochemical Laboratory Methods	4	Sr.	Quant. anal., parallel 111-112
116	Chemistry of "Vitamines" and Deficiency Diseases....	3 or 5	Sr.	111-112, 113-114, or Physiol. 101-102, or 7-8 and 15
118	Laboratory Problems in Biochemistry	3 or 5	Sr.	111-112, 113-114; or 103 or 110

† The entire course must be completed before credit is received for any quarter.
[ ] Not offered in 1920-21.

Division of Physical Chemistry

No.	Title	Hour	Day	Building	Instructor
140f-141w-142s	Physical Chemistry.....				
	Lect.	IV	MWF	225C	MacDougall
	Lab.	V-VII	F	117C	MacDougall
	Rec.	III	S	115C	Ar
146f-147w-148s	Kinetic Theory and Atomistics	Ar	Ar	C	MacDougall
149f	Principles of Colloidal Chemistry	Ar	Ar	C	Reyerson
151s	Radiochemistry	Ar	Ar	C	Henderson
152s	Radiochemistry Lab.....	Ar	Ar	C	Henderson
153f-154w-155s	Adv. Physical Chem. Lab.	Ar	Ar	C	MacDougall
159w-160s	Physical Chem. Seminar..	Ar	Ar	C	MacDougall

AGRICULTURAL BIOCHEMISTRY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

No.	Title	Hour	Day	Building	Instructor
7f-8w	General Agric. Biochemistry..	V, VI, VII, VIII	TWTh	201, 203Ch	Dutcher
7w-8s	General Agric. Biochemistry..	V, VI, VII, VIII	TWTh	201, 203Ch	Dutcher
15f	Principles of Animal Nutrition	II	TThS	39DH	Dutcher
101f-102w	Agric. Quantitative Analysis..	V, VI, VII	MWF	203Ch	Morrow
103f	Dairy Chemistry				
	Lect.	V	TWTh	251Ch	Palmer
	Lab.	VI, VII, VIII	TWTh	203Ch	Palmer
106f	Agric. Product and By-Prod.	Ar	Ar	Ar	Bailey
108s	Chem. of Wheat and Wheat Products	I	MWF	201Ch	Bailey
110s	Flour Lab. Methods.....	V, VI, VII, VIII	MWF	7Ch	Bailey
111f-112w	Phytochemistry	III	MWF	201Ch	Morrow
113f-114w	Biochemical Lab. Methods....	V, VI, VII	TTh	7Ch	Morrow
116f,w,s	Chem. of "Vitamines" and Deficiency Diseases	Ar	Ar	Ar	Dutcher, Gortner, Bailey
118f,w,s	Lab. Prob. in Biochemistry...	Ar	Ar	Ar	Dutcher, Morrow, Palmer, Willaman

COMPARATIVE PHILOLOGY

No.	Title	Credits	Offered to	Prerequisite courses
101-102†	Science of Language.....	4	Jr., sr., grad.	See note
103	Universal Language.....	2	Jr., sr., grad.	See note
105	Life of Words.....	2	Jr., sr., grad.	See note
108	Comparative Phonetics.....	3	Jr., sr., grad.	See note
109-110-111†	Hist. of the German Lang..	6	Jr., sr., grad.	See note
[141-142-143†	Hist. Gram. of Eng. Lang..	6	Jr., sr., grad.	See note]

NOTE: Prerequisites for all courses: one of the following groups: (1) five years foreign language; four may be in high school and one in college; (2) two years foreign language in college; (3) 4 credits in Old English.

DRAWING AND DESCRIPTIVE GEOMETRY

No.	Title	Credits	Offered to	Prerequisite courses
41-42-43	Technical Drawing.....	6	All	None
44-45-46	Drafting and Tracing.....	6	Soph., jr., sr.	None

† The entire course must be completed before credit is received for any quarter.
[ ] Not offered in 1920-21.

COMPARATIVE PHILOLOGY

No.	Title	Hour	Day	Building	Instructor
101f-102w†	Science of Language.....	VI	TTh	205F	Klaeber
103f	Universal Language.....	IV	TS	205F	Klaeber
105s	Life of Words.....	VI	TTh	205F	Klaeber
108f	Comparative Phonetics....	Ar	Ar	Ar	Kroesch
109f-110w-111s†	History of the German Language	VI	WF	205F	Klaeber

DRAWING AND DESCRIPTIVE GEOMETRY

No.	Title	Hour	Day	Building	Instructor
41-42-43f,w,s	Technical Drawing	I, II	MWF	13ME	Kirchner, Cederberg
		V, VI	MWF	13ME	
44f-45w-46s	Drafting and Tracing....	V, VI, VII	TTh	13ME	Kirchner, Schuck

† The entire course must be completed before credit is received for any quarter.

ECONOMICS

No.	Title	Credits	Offered to	Prerequisite courses
1-2†	Intro. to Economic History..	10	Fr. pre-bus. & maj. in econ.	None
3-4†	Principles of Economics.....	10	Soph., jr., sr.	None

† The entire course must be completed before credit is received for any quarter.

ECONOMICS

No.	Title	Hour	Day	Building	Instructor
1f-2w†	Introduction to Economic History				
	Lecture	III	TThS	CB Aud	Gras, Mudgett, Dickinson
	Section 1	I	MW		
	2	I	MW		
	3	I	MW		
	4	II	MW		
	5	II	MW		
	6	II	MW		
	7	III	MW		
	8	III	MW		
	9	IV	MW		
	10	V	WF		
	11	V	TTh		
	12	V	TTh		
	13	VI	TTh		
	14	VI	TTh		
	15	VI	TTh		
	16	VII	TTh		
3w-4s†	Principles of Economics..				
	Lecture	II	T	CB Aud	Hansen and others
	Section 1	I	MWThF	209MA	
	2	I	MWThF	109MA	
	3	II	MWThF	202MA winter 209MA spring	
	4	III	TThFS		
	5	III	TThFS		
	6	IV	MWFS	109MA	
	7	V	MWThF	102MA	
	8	V	MWThF	109MA	
	9	VI	MWThF	109MA	
	10	VI	MWThF	306D	
3f-4w†	Principles of Economics..	VII	MTWThF	202MA	James
(3s)-4f†	Principles of Economics..				
	Lecture	II	T	CB Aud	Hansen and others
	Section 1	I	MWThF	109MA	
	2	I	TThFS	209MA	
	3	I	MWThF	112Lib	
	4	II	MWThF	306D	
	5	II	MWThF	308D	
	6	II	MWThF		
	7	III	TThFS	306D	
	8	III	TThFS	308D	
	9	IV	MWFS	102MA	
	10	IV	MWFS	109MA	
	11	V	MWThF	109MA	
	12	V	MWThF	306D	
	13	V	MWThF	308D	
	14	V	TWThF	302D	
	15	VI	MWThF	306D	
	16	VI	TWThF	308D	
	17	V	MWThF	213F	

† The entire course must be completed before credit is received for any quarter.

No.	Title	Credits	Offered to	Prerequisite courses
6‡	Agricultural Economics.....	3	Soph., jr., sr.	3-4 or 5
7‡	Prin. of Econ. (Home Econ.)	5	Soph., jr., sr.	None
13‡	Agricultural Statistics	5	Soph., jr., sr.	3-4, or 5 and 6, or 7
14	Elements of Statistics.....	5	Soph.	3-4, or 5 and 6
18‡	Prob. in Agri. Econ.....	3	Soph., jr., sr.	3-4, or 5 and 6, or 7
20-21‡	Econ. Hist. and Geog. of Agriculture	10	All	None
23	Prin. of Organ. & Mngt....	5	Soph., jr., sr.	3-4, or 5 and 6

‡ Given at University Farm.

No.	Title	Hour	Day	Building	Instructor
6f	Agricultural Economics...				
	Section 1	I	MWF	Farm	Holmes, Working
	2	II	MWF	Farm	
6w	Agricultural Economics...				
	Section 1	I	MWF	Farm	Holmes, Working
	11	II	MWF	Farm	
6s	Agricultural Economics...	II	MWF	Farm	Holmes
7w	Prin. of Econ. (H.E.)...	III	MTWFS	Farm	Chambers
7s	Prin. of Econ. (H.E.)...	II	MTWFS	Farm	Holmes
13s	Agricultural Statistics....				
	Section 1	Ar	TTh	Farm	Black
14s	Elements of Statistics....				
	Lecture	IV	MWF	Lit.Th.	Mudgett
	Section 1	VII-VIII	TTh	301MA	
	2	VII-VIII	WF	301MA	
	3	III-IV	TS	301MA	
	4	I-II	MW	301MA	
	5	I-II	TTh	301MA	
	6	V-VI	MW	301MA	
	7	V-VI	TTh	301MA	
18f	Prob. in Agric. Econ....	II	TThS	Farm	Holmes
20w-21s	Economic History and Geography of Agric....			Farm	Holmes, Chambers
23w	Principles of Organization and Management.....				
	Lecture	IV	MWF	Lit.Th.	Pelz
	Section 1	I	MW	102MA	
	2	II	MW	109MA	
	3	III	MW		
	4	I	TTh	102MA	
	5	II	TTh		
	6	III	TTh		
	7	V	MW		
	8	VI	MW		
	9	V	TTh	202MA	
	10	VI	TTh	202MA	
23s	Principles of Organization and Management.....				
	Lecture	VI	MWF	Lit.Th.	
	Section 1	I	TTh		
	2	II	TTh		
	3	III	TTh		

No.	Title	Credits	Offered to	Prerequisite courses
25-26†	Principles of Accounting....	8	Soph., jr., sr.	None
41	Financial Hist. of U. S.....	3	Soph., jr., sr.	3-4, or 5 and 6
51-52-53†	Business Law	9	Jr., sr.	10 cr. econ. or pol. sci. or 5 in each
54	Corporation Finance	3	Jr., sr.	3-4, or 5 and 6
59	Life Insurance	3	Jr., sr.	3-4, or 5 and 6
60	Fire Insurance	3	Jr., sr.	3-4, or 5 and 6
[61	Property Insurance	3	Jr., sr.	3-4, or 5 and 6]
62	Social Insurance	3	Jr., sr.	3-4, or 5 and 6
72	Econ. of Transportation.....	3	Jr., sr.	54
74	Water Transportation.....	3	Jr., sr.	3-4, or 5 and 6
85-86†	Marketing of Manufactured Products	6	Jr., sr.	3-4, or 5 and 6; and 9 other cr. in econ.

† The entire course must be completed before credit is received for any quarter.
[ ] Not offered in 1920-21.

No.	Title	Hour	Day	Building	Instructor
25f-26w†	Principles of Accounting.				Noble and others
	Section 1	I	MWF	301MA	
	2	II	MWF	301MA	
	3	II	MWF	303MA	
	4	III	MWF	301MA	
	5	IV	MWF	301MA	
	6	V	MWF	303MA	
	7	I	TThS	301MA	
	8	II	TThS	303MA	
	9	III	TThS	109MA	
	10	VII	TThS	109MA	
25f-26w†	Accounting Laboratory (to be given with Principles of Accounting).....				
	Section 1	V, VI	M	301MA	
	2	VI, VII	M	303MA	
	3	III, IV	T	303MA	
	4	V, VI	T	301MA	
	5	VI, VII	T	303MA	
	6	VII, VIII	T	301MA	
	7	V, VI	W	301MA	
	8	VI, VII	W	303MA	
	9	II, III	Th	301MA	
	10	V, VI	Th	301MA	
	11	V, VI	Th	303MA	
	12	VII, VIII	Th	301MA	
	13	V, VI	F	301MA	
	14	VI, VII	F	303MA	
	15	VII, VIII	F	301MA	
	16	III, IV	S	303MA	
25w-26s†	Principles of Accounting.				
	Section 1	II	MWF		
	2	IV	MWF		
25w-26s†	Accounting Laboratory...				
	Section 1	V-VI	M		
	2	II-III	Th		
	3	V-VI	F		
41s	Financial History of the United States	I	MWF	202MA	Blakey
51f-52w-53s†	Business Law.....	II	MWF	See Political Science	
54s	Corporation Finance.....				
	Lecture	II	T		Stehman
	Section 1	II	ThS	202MA	
	2	III	TTh	109MA	
	3	III	MW	209MA	
	4	IV	MW		
	5	V	TTh	202MA	
	6	VI	TTh	102MA	
59f	Life Insurance.....	III	TThS	202MA	James
60s	Fire Insurance.....	III	TThS	202MA	James
62w	Social Insurance.....	III	TThS	202MA	James
72f	Econ. of Transportation..	V	MWF	202MA	Cummings
74s	Water Transportation....	V	MWF	202MA	Cummings
85f-86w†	Marketing of Manufactured Products.....				
	Section 1	I	TThS	202MA	Pelz
	2	VI	MWF	202MA	Pelz

† The entire course must be completed before credit is received for any quarter.

No.	Title	Credits	Offered to	Prerequisite courses
89§	Marketing of Agri. Products	5	Jr., sr.	3-4, or 5 and 6, or 7
103-104†	Value and Distribution.....	6	Jr., sr., grad.	3-4, or 5 and 6
105	Hist. of Econ. Ideas.....	3	Jr., sr., grad.	103-104
107‡	Land Economics.....	5	Sr., grad.	18
108‡	Farm Marketing Problems...	3	Jr., sr., grad.	89
109‡	Econ. of Consumption.....	3	Jr., sr., grad.	3-4, or 5 and 6, or 7
110‡	Practice Course in Marketing	3	Jr., sr., grad.	89
112-113†	Tech. of Statist. Invest.....	6	Jr., sr., grad.	14
116‡	Econ. of Agric. Production..	3	Jr., sr., grad.	18
117‡	Prices of Farm Products....	3	Jr., sr., grad.	3-4, or 5 and 6, or 7
118-119-120	Econ. Hist. of Eur. and U. S., 1750 to the Present...	9	Jr., sr., grad.	10 cred. econ. or hist. or econ. & hist. combined
[121-122-123†	Econ. Hist. of Eur., 1300-1750	9	Jr., sr., grad.	15 cred. econ. or hist. or econ. & hist. combined]
126-127-128†‡	Special Research Prob. in Agricultural Economics....	9	Sr., grad.	Ar
143-144†	Money and Banking.....	10	Jr., sr., grad.	3-4, or 5 and 6
146	Investments	3	Jr., sr., grad.	54, 143-144
149	Business Cycles.....	3	Jr., sr., grad.	143-144, 54 or 146
153	Modern Business Corporation	3	Jr., sr., grad.	3-4
154	Public Utilities.....	3	Jr., sr., grad.	54
155-156†	Valuation	4	Sr., grad.	18 cr. econ.
[157	Police Power	5	Jr., sr., grad.	13 cr. econ., pol. sci. or sociology]
158	Government and Business...	3	Jr., sr., grad.	13 cr. econ. or pol. sci.
160	Economic Motives	3	Jr., sr., grad.	3-4, or 5 and 6; psy. 1-2-3 or equiv.
161	Labor Problems and Trade Unionism	3	Jr., sr., grad.	3-4, or 5 and 6
162	Labor Movement in America	3	Jr., sr., grad.	161
167	Industrial Relations.....	3	Jr., sr., grad.	3-4, or 5 and 6; 23
169	Labor and Socialist Movement in Europe.....	3	Jr., sr., grad.	161
175	Law of Labor.....	3	Jr., sr., grad.	13 cr. in pol. sci. or econ.
176	Commercial Policies	3	Jr., sr., grad.	3-4, or 5 and 6
191-192†	Public Finance	6	Jr., sr., grad.	3-4, or 5 and 6
193	State and Local Taxation....	3	Jr., sr., grad.	191-192

† The entire course must be completed before credit is received for any quarter.
‡ Given at University Farm.
§ Given on both campuses.
[ ] Not offered in 1920-21.
NOTE: For courses primarily for graduates, see the School of Business bulletin.

No.	Title	Hour	Day	Building	Instructor
89f	Marketing of Agricultural Products				
	Section 1	III	MTWFS	Farm	
	2	V	MTWThF	Ar	Anderson
103f-104w†	Value and Distribution...	VII	MWF	102MA	Garver
105s	History of Econ. Ideas...	VII	MWF	102MA	Garver
107s	Land Economics.....	Ar	Ar	Farm	Black
108w	Farm Marketing Prob...	Ar	Ar	Farm	Black, Anderson
109w	Econ. of Consumption...	Ar	Ar	Farm	Black
110s-111f	Practice Course in Marketing	Ar	Ar	Farm	
112f-113w	Technique of Statistical Investigation	Ar	Ar	Ar	Mudgett
116w	Econ. of Agr. Production	II	TThS	Farm	Holmes
117s	Prices of Farm Products.	II	TThS	Farm	Black, Working
118-119-120	Econ. History of Europe and United States, 1750 to Present.....	II	TThS		Gras
126f-127w-128s†	Special Research Prob. in Agricultural Economics.	Ar	Ar	Farm	Black, Holmes, Working
143f-144w†	Money and Banking.....				
	Lecture	IV	TS	Dowrie,	Ebersole, Stehman
	Section 1	II	TThS	209MA	
	2	III	MWF	209MA	
	3	IV	MWF	209MA	
	4	VII	MTW	209MA	
	5	V	MWF	209MA	
	6	VI	MWF		
146s	Investments	VII	MTW	209MA	Ebersole
149s	Business Cycles	VIII	MTW	209MA	Ebersole
153w	Modern Business Corp...	III	MWF	202MA	Gray
154s	Public Utilities.....	III	MWF	202MA	Gray
155w-156s†	Valuation	IV	MWF	102MA	Gray
158w	Government and Business.	III	TThS	102MA	Young
160s	Economic Motives.....	VI	MWF		Dickinson
161f	Labor Problems and Trade Unionism.....	IV	MWF	202MA	Hansen
162w	Labor Movement in America	IV	MWF	202MA	Hansen
167w	Industrial Relations.....	II	TThS	109MA	Dickinson
169s	Labor and Socialist Movement in Europe.....	IV	MWF	209MA	Hansen
175f	Law of Labor.....	V	MWThF		Cushman
176f	Commercial Policies.....	I	MWF	202MA	Blakey
191f-192w†	Public Finance.....	III	MWF	109MA	Blakey
193s	State and Local Taxation	III	MWF	109MA	Blakey

† The entire course must be completed before credit is received for any quarter.

EDUCATION

DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND SUPERVISION

No.	Title	Credits	Offered to	Prerequisite courses
3‡	Educational Sociology.....	3	Jr., sr.	Psych. 1-2 and 4-5 (1-2-3)
5‡	Pub. Educ. in the U. S.....	3	Jr., sr.	Psych. 1-2 and 4-5 (1-2-3)
[119-120	School Curricula	6	Sr., grad.	1 or 101-102-103 and 3]
124-125-126	Educ. Adminis.	9	Sr., grad.	121
164	Prob. of High-School Admin.	3	Sr., grad.	1 and 3
167-168	Junior High School.....	4	Sr., grad.	1 and 3
167	Junior High School.....	3	Sr., grad.	1 and 3

DEPARTMENT OF HISTORY AND PHILOSOPHY OF EDUCATION

No.	Title	Credits	Offered to	Prerequisite courses
1‡	Brief Course in Hist. of Edu.	5	Jr., sr.	Psych. 1-2 and 4-5 (1-2-3)
101	Foundations of Mod. Educ.	3	Jr., sr.	Psych. 1-2 and 4-5, (1-2-3) and 6 cr. in hist.
102	Hist. of Mod. Secondary and Higher Education	3	Jr., sr., grad.	Same as for 101
103	Hist. of Mod. Elem. Educ..	3	Jr., sr., grad.	Same as for 101
114	Philosophy of Education.....	3	Sr., grad.	10 cr. in educ. or philosophy
129-130	Educational Classics	6	Jr., sr., grad.	1 or 101-102-103
131-132	Compar. School Systems....	6	Jr., sr., grad.	1 or 101-102-103
[146	Hist. and Prin. of Religious Education	3	Jr., sr., grad.	10 cr. in educ. or psy. or both]
148	Hist. of Educ. in the U. S...	3	Jr., sr., grad.	10 cr. in educ. or psy. or both

ENGLISH, RHETORIC, AND PUBLIC SPEAKING

COURSES IN ENGLISH

No.	Title	Credits	Offered to	Prerequisite courses
A-B-C	Freshman English	15	All	None
1-2-3	English Survey.....	9	Soph., jr., sr.	Rhet. 1-2-3 or 4-5-6
4	Old English	4	Soph., jr., sr.	A-B-C or equiv.
6	Chaucer	4	Soph., jr., sr.	A-B-C or equiv.
8	Shakespeare	4	Soph., jr., sr.	A-B-C or equiv.
27	Hist. of English Language..	2	Soph., jr., sr.	4
[40	Bible as Literature.....	3	Soph., jr., sr.	A-B-C or equiv.]
41	Browning and Tennyson.....	4	Soph., jr., sr.	A-B-C or equiv.
44-45	American Literature	6	Soph., jr.	A-B-C or equiv.
[51	Spenser	4	Jr., sr.	A-B-C or equiv.]
[53	Seventeenth-Century Lyrists..	4	Jr., sr.	A-B-C or equiv.]
[58-59	Nineteenth-Century Prose....	6	Jr., sr.	A-B-C or equiv.]

‡ Does not count as a Senior College course.
[ ] Not offered in 1920-21.

EDUCATION

EDUCATIONAL ADMINISTRATION AND SUPERVISION

No.	Title	Hour	Day	Building	Instructor
3f	Educational Sociology....	II	MWF	205Ed	Finney
		III	MWF	205Ed	Finney
3w,s	Educational Sociology....	III	MWF	205Ed	Finney
5w	Public Educ. in U. S....	VI	MWF	102Ed	Swift
5s	Public Educ. in U. S.... (Offered at U. Farm)	VI	MWF	Farm	Alexander
124f-125w-126s	Educational Adminis.....	VIII	MWF	205Ed	Ar
164s	Prob. of H.-S. Adminis..	I	TThS	102Ed	Koos
167f-168w	Junior High School.....	III, IV	S	112Ed	Koos
167w	Junior High School.....	II	TThS	102Ed	Koos

HISTORY AND PHILOSOPHY OF EDUCATION

No.	Title	Hour	Day	Building	Instructor
1f	Brief Course in History of Education				
	Section 1	I	TWThFS	205Ed	Alexander
	2	II	MWThFS	102Ed	Alexander
	3	IV	MTThFS	205Ed	Alexander
	4	VI	MTWThF	205Ed	Swift
1w	Brief Course in History of Education	II	MTWThF	205Ed	Alexander
1s	Brief Course in History of Education	II	MTWThF	205Ed	Alexander
101f	Found. of Modern Educ.	VII	MWF	205Ed	Swift
102w	Hist. of Modern Secondary and Higher Educ..	VII	MWF	205Ed	Swift
103s	Hist. of Modern Elem. Education	VII	MWF	205Ed	Swift
114w	Philosophy of Education..	II	MWF	322F	Swenson
129w-130s	Educational Classics.....	VI	MWF	102Ed	Swift, Alexander
131w-132s	Comparative School Systems	III	TThS	205Ed	Alexander
148s	Hist. of Educ. in U. S...	III	MWF	205Ed	Alexander

ENGLISH, RHETORIC, AND PUBLIC SPEAKING

COURSES IN ENGLISH

No.	Title	Hour	Day	Building	Instructor
A-B-C	Freshman English (See Rhetoric)				
1-2-3	English Survey.....	VI	MWF		
4w	Old English.....	V	MTThF	204F	Ruud
6f	Chaucer	VII	MWThF	205F	Brown
6w	Chaucer	II	TWFS	204F	Brown
8f,w	Shakespeare	I	MTFS	204F	Stoll
8s	Shakespeare	II	MWThF	204F	Hillhouse
27w	History of English Lang.	VIII	TTh	204F	Klaeber
41f	Browning and Tennyson..	III	MTThF	301F	Burton
44f-45w	American Literature.....	IV	MWF	15F	Moore

No.	Title	Credits	Offered to	Prerequisite courses
62	Milton	4	Jr., sr.	A-B-C or equiv.
[64	Bacon	4	Jr., sr.	A-B-C or equiv.]
66	English Novel	4	Jr., sr.	A-B-C or equiv.
70	Masterpieces of Elizabethan Drama	4	Jr., sr.	8
101	Middle English	2	Jr., sr., grad.	4, 6
103	Beowulf	3	Jr., sr., grad.	4, and 4 cred. in courses below 10
[105-106	Eighteenth-Century Poetry	6	Jr., sr., grad.	8 credits in courses below 10]
107-108†	Eighteenth-Century Prose	6	Jr., sr., grad.	8 credits in courses below 10
109-110†	Romantic Poets	6	Jr., sr., grad.	8 credits in courses below 10
[111-112	Seventeenth-Century Prose	6†	Sr., grad.	A-B-C and 8 cred. in courses below 10]
123-124-125	Victorian Novelists	9	Jr., sr., grad.	8 credits in courses below 10
129	Modern Drama	4	Jr., sr., grad.	8, and 4 cr. in courses below 10
131	Formal Satire	4	Jr., sr., grad.	8 credits in courses below 10
133	Ballads	4	Jr., sr., grad.	8 credits in courses below 10
136	Adv. Shakespeare	4	Jr., sr., grad.	8, and 4 cr. in courses below 10. See note
140	Advanced Chaucer	4	Jr., sr., grad.	6, and 4 cr. in courses below 10. See note
[141-142-143	Historical Grammar	6	Sr., grad.	4 and 4 credits below 10]
145	Medieval Allegory	4	Jr., sr., grad.	6, and 4 cr. in courses below 10
[146-147	Metrical Romances	6	Sr., grad.	6 and 4 cr. in courses below 10]
150	Victorian Poetry	4	Jr., sr., grad.	Either 8 cred. in courses below 10 or 4 cr. in 109-110
[151	Recent Poetry	4	Jr., sr., grad.	Either 8 credits in courses below 10 or 4 cr. in 109-110 or 150
152	Pre-Elizabethan Drama	4	Jr., sr., grad.	8, and 4 cr. in courses below 10
155	American Novel	4	Jr., sr., grad.	Either 8 cred. in courses below 10 or 4 cred. and 54-55

† The entire course must be completed before credit is received for any quarter.

[ ] Not offered in 1920-21.

NOTE: A-B-C, as a prerequisite, has for its equivalent the courses formerly numbered English 1-2-3 and Rhetoric 1-2-3.

Note to 136: Open without further prerequisites to students receiving B in English 8.

Note to 140: Open without further prerequisites to students receiving B in English 6.

No.	Title	Hour	Day	Building	Instructor
62w	Milton	VI	MTThF	204F	Stoll
66f	English Novel	IV	MTWF	301F	Burton
70w	Masterpieces of Elizabethan Drama	II	MTThF	205F	Stoll
101f	Middle English	V	TTh	204F	Klaeber
103s	Beowulf	V	MWF	204F	Klaeber
107f-108w†	Eighteenth-Century Prose.	VII	MWF	204F	Moore
109w-110s†	Romantic Poets	III	TThS	301F	Beach
123f-124w-125s†	Victorian Novelists	I, II	S	302F	Beach
129f	Modern Drama	II	MTThF	301F	Burton
131s	Formal Satire	VII	MTWF	204F	Moore
133f	Ballads	VI	MWF	302F	Stoll
136s	Advanced Shakespeare	I	MTThF	205F	Stoll
140s	Advanced Chaucer	II	MTThF	205F	Brown
145w	Medieval Allegory	V	MTThF	205F	Brown
150s	Victorian Poetry	VI	MTThF	204F	Stoll
152s	Pre-Elizabethan Drama	III	TWFS	302F	Brown
155s	American Novel	IV	MWF	15F	Moore

† The entire course must be completed before credit is received for any quarter.

COURSES IN RHETORIC

No.	Title	Credits	Offered to	Prerequisite courses
A-B-C	Freshman English.....	15	All	None
4-5-6	Composition for Technical Students	9	All	None
11-12-13	Exposition, Description, Narration	9	Soph., jr., sr.	A-B-C, 1-2-3, or 4-5-6
15-16-17	Exposition and Argument...	9	Soph., jr., sr.	A-B-C, 1-2-3, or 4-5-6
31	Technical Writing.....	3	Soph., jr., sr.	4-5-6
100-101	Versification	6	Jr., sr., grad.	See note
103-104-105	Studies in Structure and Style	9	Jr., sr., grad.	11-12-13, or 15-16-17
107	Imitative Writing.....	4	Jr., sr., grad.	See note
109-110	Short-Story Writing.....	6	Jr., sr., grad.	See note
111-112-113	Essay-Writing	9	Jr., sr., grad.	11-12-13, or 15-16-17
115-116-117	Dramatic Technique.....	9	Jr., sr., grad.	See note
119-120-121	Seminar in Writing.....	9	Sr., grad.	See note

NOTES: Course 100-101. Open to those who have taken 11-12-13 or 15-16-17, and who have taken or are taking nine hours in the historical study of English poetry.

Course 107, 109-110. Open to those who have taken 11-12-13 or 15-16-17 and received a grade of A or B in at least two quarters.

Course 115-116-117. Open to those who have taken 11-12-13 and have taken or are taking English 129.

Course 119-120-121. Open with special permission to seniors and graduates. Prerequisites 11-12-13, and nine additional credits in rhetoric.

COURSES IN PUBLIC SPEAKING

No.	Title	Credits	Offered to	Prerequisite courses
41-42-43	Public Speaking.....	9	Soph., jr., sr.	Rhet. A-B-C, 1-2-3, or 4-5-6

COURSES IN RHETORIC

No.	Title	Hour	Day	Building	Instructor
Cf	Freshman English.....				
	Lect.	III	W	Lit.Th.	
	Rec.	V	MTThF		
		VI	MTThF		
		VII	MTThF		
Af-Bw-Cs	Freshman English.....				
	Lect.	II	M	CB Aud	
	Rec.	I	TThFS		
		II	TThFS		
	Lect.	IV	T	CB Aud	
	Rec.	III	MWFS		
		IV	MWFS		
	Lect.	VI	T	CB Aud	
	Rec.	V	MWThF		
		VI	MWThF		
		VII	MWThF		
Aw-Bs	Freshman English.....				
	Lect.	III	W	Lit.Th.	
	Rec.	V	MTThF		
		VI	MTThF		
		VII	MTThF		
4f-5w-6s	Composition for Tech. Students	I	MWF	Assigned on registration	
		II	MWF	Assigned on registration	
		VII	MWF	Assigned on registration	
		I	TThS	Assigned on registration	
		II	TThS	Assigned on registration	
4w-5s	Composition for Tech. Students	II	TThS	Assigned on registration	
11f-12w-13s	Exposition, Description, Narration	II	MWF	306F	Ruud
		III	MWF	306F	Hillhouse
		IV	MWF	306F	Nichols
		V	MWF	304F	Chase
		VI	MWF	306F	Draper
		II	TThS	304F	Hustvedt
		III	TThS	306F	Phelan
15f-16w-17s	Exposition and Argument.	II	MWF	304F	Ford
100w-101s	Versification	IV	TS & Ar	304F	Nichols
103f-104w-105s	Studies in Structure and Style	VI	MWF	304F	Ford
107f	Imitative Writing	IV	MTWF	304F	Phelan
109w-110s	Short-Story Writing.....	IV	MWF	304F	Phelan
111f-112w-113s	Essay Writing	III	MWF	304F	Sutcliffe
115f-116w-117s	Dramatic Technique.....	III	TThS	304F	Ar
119f-120w-121s	Seminar in Writing.....	V, VI	T	304F	Thomas

COURSES IN PUBLIC SPEAKING

No.	Title	Hour	Day	Building	Instructor
41f-42w-43s	Public Speaking				
	Section 1	II	MWF	308F	Ar
	2	III	MWF	204F	Ar
	3	VI	MWF	15F	Macnaughton
	4	I	TThS	308F	Lindsley
	5	II	TThS	308F	Lindsley
(41w-42s)-43f	Public Speaking.....	I	MWF	308F	Lindsley
41w-42s-(43f)	Public Speaking.....	V	MWF	308F	Lindsley

No.	Title	Credits	Offered to	Prerequisite courses
45-46	Public Speaking.....	10	Soph., jr., sr.	Rhet. A-B-C, 1-2-3, or 4-5-6
55-56-57	Arg. and Debate.....	9	Jr., sr.	41-42-43 or 45-46
81-82-83	Int. Reading.....	9	Jr., sr.	41-42-43 or 45-46
85-86-87	Adv. Pub. Speaking.....	9	Jr., sr.	41-42-43 or 45-46
91-92-93	Play Production.....	9	Jr., sr.	Eng. 8, Pub. Sp. 81-82-83
97	Adv. Debate.....	3	.....	Intercollegiate debaters and orators

GEOLOGY AND MINERALOGY

No.	Title	Credits	Offered to	Prerequisite courses
1-2†‡	General Geology	10	3rd qu. fr., soph., jr., sr.	Course in chem.
[4	Geology of Minnesota.....	3	Soph., jr., sr.	Geol. 1]
7-8	General Geol. Lab.....	2	3rd qu. fr., soph., jr., sr.	Supports 1-2
11-12†§	Introduction to Geology.....	8	3rd qu. fr., soph., jr., sr.	None
15¶	Minerals and Rocks.....	1	Jr., sr.	1 or 29
19	Elem. of Paleont.	5	Soph., jr., sr.	1-2
21-22†	Essent. of Mineralogy.....	6	Soph., jr., sr.	Course in chem.
23-24-25†	Elem. of Mineralogy.....	9	Soph., jr., sr.	Courses in chem.
27¶	Outlines of Mineralogy.....	1	Jr., sr.	None
29§	General Physiog.	5	Soph., jr., sr.	None
[30§	Principles of Geog.	5	Soph., jr., sr.	None; 1 or 29 desirable]
34§	Meteorology	5	Soph., jr., sr.	None
37§	Econ. and Commerc. Geog..	5	Soph., jr., sr.	None
51-52†	Econ. Geol.	6	Jr., sr.	1-2
57-58-59	Paleontology	9	Jr., sr.	1-2
61	Blowpipe Anal.	3	Jr., sr.	22 or 25
[65	Crystallography	3	Jr., sr.	22]
85	Field Work in North. Minn.	6	Jr., sr.	2
91-92-93	Index Fossils of N. A.....	9	Jr., sr.	1-2
101	Princip. of Stratig.	3	Jr., sr., grad.	24-25
105	Elem. of Rock Study.....	3	Jr., sr., grad.	22 or 25
106	Petrography	3	Jr., sr., grad.	105
107-108-109	Paleontologic Practice	9	Jr., sr., grad.	57-58-59
111	Ore Deposits	3	Jr., sr., grad.	2, 105
112	Geology of Petroleum.....	3	Sr., grad.	111
113	Prob. in Ore Deposits.....	3	Sr., grad.	112
114	Geog. of N. A.	5	Jr., sr.	34 or 37
115	Geographic Influences	3	Jr., sr.	114
116	Geog. of S. A.	3	Jr., sr., grad.	114

† The entire course must be completed before credit is received for any quarter.

‡ Satisfies the Junior College requirement for science under the new curriculum.

§ Does not satisfy the Junior College requirement for science under the new curriculum.

¶ Does not count as a Senior College course.

[ ] Not offered in 1920-21.

No.	Title	Hour	Day	Building	Instructor
45f-46w	Public Speaking.....				
	Section 1	IV	MTWFS	125F	Ar
	2	VII	MTWThF	15F	Ar
45s-(46f)	Public Speaking.....				
	Section 1	IV	MTWFS	125F	Ar
	2	VII	MTWThF	15F	Ar
(45s)-46f	Public Speaking.....	III	MTThFS	308F	Rarig
45w-46s	Public Speaking	III	MTThFS	308F	Rarig
55f-56w-57s	Arg. and Debate.....	VI	MWF	3F	Lindsley
81f-82w-83s	Int. Reading.....	IV	MWF	308F	Rarig
85f-86w-87s	Adv. Public Speaking....	VI	MWF	308F	Rarig
91f-92w-93s	Play Production.....	VII	MWF	212F	Macnaughton
97f,w	Adv. Debate and Oratory.	Ar	Ar	308F	Lindsley, Rarig

GEOLOGY AND MINERALOGY

No.	Title	Hour	Day	Building	Instructor
1f-2w†	General Geology.....	I	TWThFS	210P	Tieje
		III	MTThFS	110P	Emmons
		VI	MTWThF	110P	Emmons
1w-2s†	General Geology.....	II	MWThFS	210P	Tieje
1s-2w†	General Geology.....	III	MTThFS	110P	Emmons
7f-8w	General Geology Lab.....	Ar	Ar	112P	Schwartz
7w-8s	General Geology Lab.....	Ar	Ar	112P	Schwartz
7s	General Geology Lab.....	Ar	Ar	112P	Schwartz
11f-12w†	Introduction to Geology..	VII	MTWThF	200aP	Tieje
15s	Minerals and Rocks.....	Ar	Ar	100P	Grout
19s	Elements of Paleontology.	I	MTWThF	110P	Stauffer
21w-22s†	Essentials of Mineralogy.				
	Lect.	IV	MWF	210P	Broderick
	Lab.	V-VIII	F	100P	Broderick
	Lab.	III	MWF	100P	Broderick
23f-24w-25s†	Mineralogy	Consult Mines Program		Ar	Broderick
27s	Outlines of Mineralogy...	Ar	Ar	Ar	Grout
29f	General Physiography....	III	MTThFS	210P	Posey
34w	Meteorology	III	MTThFS	210P	Posey
37s	Econ. and Com. Geog....	III	MTThFS	210P	Posey
51f-52w†	Economic Geology.....	II	MWF	210P	Schwartz
57f-58w-59s	Paleontology	II, III	TThS	105P	Stauffer
61f	Blowpipe Analysis.....	Ar	Ar	Ar	Broderick
85s	Field Work in Northern Minnesota				
91f-92w-93s	Index Fossils.....				
	Lect.	II	M	105P	Stauffer
	Lab.	VI, VII	WF	105P	Stauffer
101f	Principles of Stratigraphy	III	TThS	Ar	Tieje
105f	Rock Study.....	V, VI	TTh	110P	Grout
106w	Petrography	V, VI	TTh	200P	Grout
107f-108w-109s	Paleontologic Practice....	VI, VII	MWF	105P	Stauffer
111f	Ore Deposits.....	I	TThS	110P	Emmons
112w	Geology of Petroleum....	I	TThS	110P	Emmons
113s	Prob. in Ore Deposits...	Ar	Ar	104P	Emmons
114f	Geog. of North America.	I	TThS	200aP	Posey
115	Geographic Influences....				
116w	Geog. of South America..	I	MWF	200aP	Posey

† The entire course must be completed before credit is received for any quarter.

No.	Title	Credits	Offered to	Prerequisite courses
117	Resources and Trade.....	3	Jr., sr., grad.	37, 116 or 117
118	Geography of Europe.....	3	Jr., sr., grad.	114
119	Geography of Asia.....	3	Jr., sr., grad.	116 or 118
124-125	Structural and Metamorphic Geology	6	Sr., grad.	2, 105
131-132-133	Advanced Petrology	9	Jr., sr., grad.	106
137	Testing Economic Minerals..	3	Jr., sr., grad.	2, 105
140-141	Applied Petrography.....	6	Jr., sr., grad.	131
144-145	Const. and Inter. of Geologic Maps	6	Jr., sr., grad.	2
150	Field Geol. (Black Hills)....	10	Jr., sr., grad.	See members of department
151-152-153	Adv. General Geology.....	9	Jr., sr., grad.	2
166-167	Mineralography	6	Sr., grad.	111

GERMAN

No.	Title	Credits	Offered to	Prerequisite courses
1	Beginning	5	All	None
2	Beginning, Intermediate	5	All	1 or 1 yr. prep. German
3	Beginning, Advanced.....	5	All	2
4-5-6†	Beginning, Chemists, Miners.	9	Chem., miners	None
7	Intermed., Chemists, Miners.	3	Chem., miners	6 or 1 yr. prep. German
10	Rapid Reading	5	All	3
11	Adv. Rapid Reading.....	5	All	10
12	Narrative Prose	5	All	2 yrs. prep. Germ.

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Building	Instructor
117s	Resources and Trade.....	I	MWF	200aP	Posey
118w	Geog. of Europe.....	I	TThS	200aP	Posey
119s	Geog. of Asia.....	I	TThS	200aP	Posey
124w-125s	Struct. and Met. Geol....	III	TThS	200aP	Schwartz
131f-132w-133s	Adv. Petrology.....	Ar	Ar	200P	Grout
137w	Testing Econ. Minerals..				
	Lect.	VIII	W	200P	Grout
	Lab.	VII	MT	200P	Grout
140w-141s	Applied Petrography.....	Ar	TThS	200P	Grout
144w-145s	Const. and Int. of Geol Maps	V-VII	TTh	104P	Schwartz
150s	Field Geol. (Black Hills)				
151f-152w-153s	Adv. General Geology....	IV	MWF	200aP	Stauffer
166w-167s	Mineralography	Ar	Ar	Ar	Broderick

GERMAN

No.	Title	Hour	Day	Building	Instructor
1f	Beginning	II	MWThFS	207F	Ar
		IV	MTWFS	207F	Ar
		VI	MTWThF	207F	Ar
1w	Beginning	I	TWThFS	207F	Ar
		V	MTWThF	207F	Ar
1s	Beginning	II	MWThFS	207F	Ar
		V	MTWThF	207F	Ar
2f	Beginning Intermediate...	I	TWThFS	207F	Ar
		VI	MTWThF	209F	Ar
2w	Beginning Intermediate...	II	MWThFS	207F	Ar
		IV	MTWFS	207F	Ar
		VI	MTWThF	207F	Ar
2s	Beginning Intermediate...	I	TWThFS	207F	Ar
		V	MTWThF	209F	Ar
3f	Beginning Advanced.....	IV	MTWFS	209F	Ar
		V	MTWThF	207F	Ar
3w	Beginning Advanced.....	I	TWThFS	209F	Ar
		VI	MTWThF	209F	Ar
3s	Beginning Advanced.....	II	MWThFS	209F	Ar
		IV	MTWFS	207F	Ar
		VI	MTWThF	207F	Ar
4f-5w-6s†	Begin. for Chemists.....	III	MWF	212F	Ar
		III	TThS	207F	Ar
7f	Chemists Intermediate....	III	TThS	212F	Davies
10f	Rapid Reading.....	II	MWThFS	209F	Kroesch
		IV	MTWFS	212F	Davies
10w	Rapid Reading.....	IV	MTWFS	209F	Koenig
		V	MTWThF	209F	Ar
10s	Rapid Reading.....	I	TWThFS	209F	Kuhlman
		VI	MTWThF	209F	Ar
11f	Adv. Rapid Reading.....	II	MWThFS	209½F	Kuhlman
11w	Adv. Rapid Reading.....	II	MWThFS	209F	Kroesch
		IV	MTWFS	212F	Davies
11s	Adv. Rapid Reading.....	IV	MTWFS	209F	Davies
12f	Narrative Prose.....	III	MTThFS	213F	Hendrickson
12w	Narrative Prose.....	II	MWThFS	213F	Kuhlman
12s	Narrative Prose.....	II	MWThFS	213F	Hendrickson

† The entire course must be completed before credit is received for any quarter.

No.	Title	Credits	Offered to	Prerequisite courses
13	Adv. Narrative Prose.....	5	All	12 or 3 yrs. prep. German
14	Prose and Poetry.....	5	All	13
15	Narrative Prose for Chemists, Pre-medics, and Miners...	4	Chem., pre-med., and miners	2 yrs. prep. Germ.
25-26†	Elementary Scientific.....	6	Chem., miners	7
28-29†	Adv. Chemical German.....	6	Chem., miners	15
31-32†	Medical German	6	Pre-medics	10 or 15
40	Commercial German	5	All	10 or 12
50-51-52†	Composition	3	Jr., sr.	11 or 14 or 4 yrs. prep. German
53-54-55†	Conversation	3	Jr., sr.	11 or 14 or 4 yrs. prep. German
56-57-58†	Essay-Writing	6	Jr., sr.	52
[59-60-61†	Oral Diction.....	6	Jr., sr.	55]
62	German Comedies	3	Jr., sr.	11 or 14 or 4 yrs. prep. German
63	Modern Drama	3	Jr., sr.	11 or 14 or 4 yrs. prep. German
64	Classic Drama	3	Jr., sr.	62 or 63
65	Survey through Reformation.	3	Jr., sr.	3 cr. above 50
66	Survey 18th Century.....	3	Jr., sr.	3 cr. above 50
67	Survey 19th Century.....	3	Jr., sr.	3 cr. above 50
72	Drama since 1880 (Sudermann)	3	Jr., sr.	9 cr. above 50
73	Drama since 1880 (Hauptmann)	3	Jr., sr.	9 cr. above 50
77	Faust, Part I.....	3	Jr., sr.	6 cr. above 50
100-101-102†	Middle High German.....	9	Sr., grad.	9 cr. above 50
[107	Historical German Grammar.	3	Sr., grad.	9 cr. above 50]
108	Comparative Phonetics	3	Sr., grad.	9 Sr. Coll. cr. in mod. lang.
109-110-111†	Hist. of German Language..	9	Sr., grad.	9 cr. above 50
120-121-122†	Drama of Nineteenth Century	9	Sr., grad.	9 cr. above 50
[150-151-152	Novelle	3	Sr., grad.	9 cr. above 50]
153-154-155†	Aspects of German Literature	9	Sr., grad.	9 cr. above 50
160-161-162†	Lyric Poetry	9	Sr., grad.	9 cr. above 50
225-226-227†	Literary Problems	9	Gr., sr. with major in Ger.	Major in German

NOTE: Courses numbered 50 to 100 are open without petition to sophomores who have the prerequisites and who satisfy the requirements given on page 18.

GREEK

No.	Title	Credits	Offered to	Prerequisite courses
1-2†-3	Beginning Greek	15	All	None
4-5-6	History and Epic Poetry....	10 or 15	All	1-2-3
7	Every-Day Greek	3	Soph., jr., sr.	1 yr. of language
51	Philosophy	3	Jr., sr.	4-5, or 4-6, or 5-6
52	Oratory	3	Jr., sr.	4-5, or 4-6, or 5-6
53	Dramatic Poetry	3	Jr., sr.	51, or 52
105	Lyric Poetry.....	3	Sr., grad.	51 & 53, or 52 & 53
106	Advanced Drama.....	3	Sr., grad.	53 or 101
107‡	Advanced Prose	3	Sr., grad.	51-52, or 51-53, or 52-53
108§	Advanced Epic Poetry.....	3	Sr., grad.	105 or 106
109§	New Testament	3	Jr., sr., grad.	51 and 52

† The entire course must be completed before credit is received for any quarter.
‡ Courses 105 and 107 are offered alternately.
§ Courses 108 and 109 are offered alternately.
[ ] Not offered in 1920-21.

No.	Title	Hour	Day	Building	Instructor
13f	Adv. Narrative Prose....	II	MWThFS	213F	Ar
13w	Adv. Narrative Prose....	III	MTThFS	213F	Hendrickson
13s	Adv. Narrative Prose....	II	MWThFS	212F	Ar
14w	Prose and Poetry.....	II	MWThFS	209½F	Downs
14s	Prose and Poetry.....	III	MTThFS	213F	Downs
15f	Narrative Prose for Pre-Medics	I	MTWTh	209F	Koenig
15f	Narrative Prose for Chem.	III	MTWTh	209F	Downs
25w-26s†	Elementary Scientific.....	III	TThS	212F	Davies
28w-29s†	Adv. Chem. German.....	III	MWF	209F	Ar
(31s)-32f†	Medical German.....	I	MWF	209½F	Burkhard
31f-32w†	Medical German.....	I	MWF	213F	Downs
31w-32s†	Medical German.....	I	MWF	209½F	Burkhard
		I	TThS	209½F	Ar
31s-(32f)†	Medical German.....	I	MWF	213F	Downs
40w	Commercial German.....	V	MTWThF	213F	Kuhlman
40s	Commercial German.....	V	MTWThF	213F	Kuhlman
50f-51w-52s†	Composition	III	M	207F	Koenig
53f-54w-55s†	Conversation	III	WF	207F	Burkhard
56f-57w-58s	Essay-Writing	IV	TS	209½F	Kroesch
62f	German Comedies	IV	MWF	209½F	Myers
62s	German Comedies.....	II	MWF	209½F	Davies
63w	Modern Drama.....	IV	MWF	209½F	Myers
64s	Classic Drama.....	IV	MWF	209½F	Myers
65s	Survey through Reform..	III	TThS	209F	Kroesch
66f	18th-Century Survey.....	III	TThS	209½F	Burkhard
66s	18th-Century Survey.....	III	TThS	209½F	Burkhard
67w	19th-Century Survey.....	III	TThS	209½F	Burkhard
72w	Drama since 1880 (Sudermann)	IV	MWF	213F	Schlenker
73s	Drama since 1880 (Hauptmann)	IV	MWF	213F	Schlenker
77f	Faust I.....	IV	MWF	213F	Schlenker
100f-101w-102s†	Middle High German....	Ar	Ar	Ar	Kroesch
108f	Comp. Phonetics.....	Ar	Ar	Ar	Kroesch
108w	Comp. Phonetics.....	Ar	Ar	Ar	Kroesch
109f-110w-111s†	Hist. of German Lang...	VI	WF	205F	Klaeber
120f-121w-122s†	19th-Century Drama.....	VI, VII, VIII	M	209½F	Myers
153f-154w-155s†	Aspects of German Lit...	V, VI, VII	T	209½F	Burkhard
160f-161w-162s†	Lyric Poetry.....	V, VI, VII	F	209½F	Davies
225f-226w-227s†	Lit. Problems.....	Ar	W	208F	Schlenker

GREEK

No.	Title	Hour	Day	Building	Instructor
1f-2w†-3s	Beginning Greek.....	IV	MTWFS	114F	Savage
4f-5w-6s	Histbry and Epic Poetry.	III	MTThFS	114F	Savage
7f,w	Every-Day Greek	VI	MWF	114F	Savage
51f	Philosophy	Ar	Ar	114F	Savage
52w	Oratory	Ar	Ar	114F	Savage
53s	Dramatic Poetry	Ar	Ar	114F	Savage
105f	Lyric Pöetry.....	Ar	Ar	112F	Savage
106w	Advanced Drama.....	Ar	Ar	112F	Savage
107w	Advanced Prose	Ar	Ar	112F	Savage
108s	Advanced Epic Poetry....	Ar	Ar	112F	Savage
109s	New Testament	Ar	Ar	112F	Savage

† The entire course must be completed before credit is received for any quarter.

Courses for which no knowledge of Greek is required. Not Senior College courses

No.	Title	Credits	Offered to	Prerequisite courses
[41	Architecture	2	Jr., sr.	None]
42	Sculpture	2	Jr., sr.	None
43	Drama	2	Jr., sr.	None
44	Literature and Life.....	2	Jr., sr.	None
45	Mythology	2	Jr., sr.	None

HISTORY

No.	Title	Credits	Offered to	Prerequisite courses
1-2†	Modern World	10	All	None
3-4†	England, 1066 to Present....	10	All	None
5-6	American Hist.	10	3rd qu. fr., soph., jr., sr.	None (for fr., 10 credits)

† The entire course must be completed before credit is received for any quarter.
[ ] Not offered in 1920-21.

Courses for which no knowledge of Greek is required

No.	Title	Hour	Day	Building	Instructor
42s	Greek Sculpture.....	VI	TTh	114F	Savage
43f	Greek Drama.....	VI	TTh	114F	Savage
44w	Greek Literature and Life	VI	TTh	114F	Savage
44s	Greek Literature and Life	I	WF	114F	Savage
45f,w	Greek Mythology.....	I	WF	114F	Savage

HISTORY

No.	Title	Hour	Day	Building	Instructor
1f-2w†	Modern World				
	Lecture	II	MWS	Lit.Th.	Ford, Krey, Tyler
	Section 1	II	TTh		
	2	II	TTh		
	3	III	TTh		
	4	III	TTh		
	5	V	TTh		
	6	V	TTh		
	7	VI	TTh		
	8	VI	TTh		
	9	VII	TTh		
	10	VII	TTh		
1w-2s†	Modern World				
	Lecture	III	MWS	Law Aud.	Tyler
	Section 1	III	TTh		
	2	III	TTh		
	3	III	TTh		
	4	II	TTh		
	5	V	TTh		
	6	V	TTh		
	7	VII	TTh		
3f-4w†	England, 1066 to Present				
	Lecture	VI	MWF	Lit.Th.	White
	Section 1	I	TTh		
	2	V	TTh		
	3	IV	TS		
	4	IV	TS		
	5	VI	TTh		
	6	VI	TTh		
3s-4w†	England, 1066 to Present				
	Lecture	III	MWF	CB Aud	White
	Section 1	V	TTh		
	2	IV	TS		
	3	IV	TS		
	4	VI	TTh		
	5	VI	TTh		
5f-6w	American History.....				
	Lecture	VI	MWF	301F	Shippee
	Section 1	VI	TTh		Stephenson
	2	IV	TS		Stephenson
	3	IV	TS		Stephenson
	4	III	TS		Stephenson
(5s)-6f	American History	III	MTThFS	Law Aud.	Shippee
5s-(6f)	American History.....	III	MTThFS	Ar	Shippee

† The entire course must be completed before credit is received for any quarter.

No.	Title	Credits	Offered to	Prerequisite courses
9-10†	Introd. to Econ. Hist.....	10	3rd qu. fr., soph., jr., sr.	10 cr.
11-12-13†	Medieval History	9	3rd. qu. fr., soph., jr., sr.	10 cr.
25	World Politics	5	3rd qu. fr., soph., jr., sr.	10 cr. soc. sci.
101-102†	French Revolution	6	Jr., sr., grad.	15 cr. soc. sci. incl. 10 in hist.
103	Near East: Old Orient.....	5	Jr., sr., grad.	15 cr. soc. sci.
104	Near East: Modern.....	5	Jr., sr., grad.	15 cr. soc. sci. incl. 10 in hist.
105	History of Rome.....	5	Jr., sr., grad.	15 cr. soc. sci.
107-108	Europe, 1848-1914	8	Jr., sr., grad.	15 cr., see note‡
[109-110	English Hist., 1815-1920....	6	Jr., sr., grad.	15 cr. soc. sci.]
111	Eur. Background and Amer. Immigration	4	Jr., sr., grad.	15 cr. soc. sci.
112	American Immigration	4	Jr., sr., grad.	15 cr. soc. sci.
113-114-115†	Econ. Hist. of Eur. and U. S.	9	Jr., sr., grad.	15 cr. hist., econ., or both
[116-117-118†	Econ. Hist. of Eur., 1300-1750	9	Jr., sr., grad.	15 cr. hist., econ., or both]
119	Renaiss. and Reform.	5	Jr., sr., grad.	15 cr.
121-122†	Eng. Background of Amer. Col.	6	Jr., sr., grad.	15 cr. hist. or pol. sci.
125	Amer. Diplom. Hist.	4	Jr., sr., grad.	15 cr., incl. Hist. 5-6 or 10 cr. in pol. sci.
127	Amer. For. Rel.	4	Jr., sr., grad.	15 cr., incl. Hist. 5-6 or 10 cr. in pol. sci.
133-134†	Ancient Civiliz.: Greece.....	6	Jr., sr., grad.	15 cr., or major in Greek or Latin
135	Ancient Civiliz.: Rome.....	3	Jr., sr., grad.	15 cr., or major in Greek or Latin
[137-138†	Eng. Leg. Institutions.....	5	Jr., sr., grad.	15 cr. soc. sci. incl., Hist. 3-4]
140	Rec. Amer. Hist.....	5	Jr., sr., grad.	15 cr. soc. sci., incl. 5-6 or Pol. Sci. 1
[141	West in Amer. Hist. to 1815	3	Jr., sr., grad.	15 cr. soc. sci. incl. 5-6]
[142	West in Amer. Hist.: 1815-1865	3	Jr., sr., grad.	15 cr. soc. sci. incl. 5-6]
144-145†	Hist. of Minn.....	6	Jr., sr., grad.	15 cr. incl. 5-6
146-147†	Constitutional Hist. of U. S.	6	Jr., sr., grad.	15 cr. hist. or 10 cr. hist. and 5 cr. pol. sci.
148-149-150†	British Empire in 18th Cent.	9	Jr., sr., grad.	15 cr. soc. sc., incl. 10 in hist.
[153	West in Amer. Pol. since 1865	5	Sr., grad.	20 cr. incl. 5-6]
154	Topics, Minnesota	5	Sr., grad.	20 cr. incl. 5-6

† The entire course must be completed before credit is received for any quarter.
‡ Consent of instructor if History 1-2 not offered.
[ ] Not offered in 1920-21.

No.	Title	Hour	Day	Building	Instructor
9f-10w†	Economic History.....				
	Lecture	III	TThS	CB Aud.	Gras, Mudgett, Dickinson
	Sections. See Economics 1-2, Economics program.				
11f-12w-13s†	Medieval History.....	III	MTThFS	112Lib	Krey
25f	World Politics.....	V	MTWThF	102MA	Tyler, Quigley
101f-102w†	French Revolution.....	I	MWF	111Lib	Ford
103f	Near East: Old Orient...	III	MTThFS	111Lib	Davis
104w	Near East: Modern.....	III	MTThFS	111Lib	Davis
105s	History of Rome.....	III	MTThFS	111Lib	Davis
107f-108w†	Europe, 1848-1914	VI	MTThF	111Lib	Tyler
111w	European Background of American Immigration.	V	TWThF	111Lib	Stephenson
112s	American Immigration...	V	TWThF	111Lib	Stephenson
113f-114w-115s†	Econ. Hist. Europe and United States	II	TThS	218bLib	Gras
119s	Renaissance and Reform.	IV	MTWFS	111Lib	Krey
121w-122s†	English Backgrounds of American Colonization..	II	TThS	112Lib	White
125w	American Diplomatic Hist.	III	MWFS	218bLib	Wright
127s	American Foreign Relations	III	MWFS	102MA	Wright
133f-134w†	Ancient Civilization: Greece	VII	MWF	111Lib	Davis
135s	Ancient Civilization: Rome	VII	MWF	111Lib	Davis
140s	Recent American History.	I	TWThFS	111Lib	Shippee
144f-145w†	History of Minnesota....	VI	MWF	112Lib	Buck
146w-147s†	Constitutional Hist., U. S.	IV	MWF	218bLib	Shippee
148-149-150†	British Empire in the 18th Century	II	MWF	Ar	Alvord
154s	Topics, Minnesota.....	VI-VII	WF	218aLib	Buck

† The entire course must be completed before credit is received for any quarter.

No.	Title	Credits	Offered to	Prerequisite courses
[155	United States, 1850-1865....	5	Sr., grad.	20 cr. incl. 5-6]
156	U. S.: Reconstruction	5	Sr., grad.	20 cr. incl. 5-6
157-158	Topics, 19th Century.....	10	Sr., grad.	20 cr. incl. 107-108 or 101-102
160	Topics, American Colonial...	5	Sr., grad.	20 cr., incl. 5-6 or 148-149-50†
162	Begin. of Parliament.....	5	Sr., grad.	20 cr., knowledge of high-school Latin
164	Studies in the Crusades.....	5	Sr., grad.	20 cr., knowledge of high-school Latin
166	Topics, Hist. of Immig.....	5	Sr., grad.	20 cr., consent of instructor
[183	Stuart Period	5	Sr., grad.	20 cr., incl. 3-4]

HOME ECONOMICS

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

NOTE: Only courses with 15 credits prerequisite will count as Senior College courses.

Introductory Courses

No.	Title	Credits	Offered to	Prerequisite courses
3	Textiles	5	All	None
11	Garment-Making	3	All	None
13	Dressmaking	5	Soph., jr., sr.	3, 11, 51, Home pract. in garment-making
17	Adv. Clothing Construction.	3	Jr., sr.	13, 52, 53
21	Foods and Cookery.....	5	Soph., jr., sr.	Chem. 5 cr. physiol. 3 parallel
22	Food Economics	5	Soph., jr., sr.	21
34	Home Management: Operation and Maintenance, Lect.	3	Jr.,‡ sr.	22, 35, parallel
40	Child-Training	3	Jr., sr.	37, Psychol. 1-2, Econ. 7, or parallel
51	Drawing and Design.....	3	All	None

† The entire course must be completed before credit is received for any quarter.
‡ College of Education.
[ ] Not offered in 1920-21.

No.	Title	Hour	Day	Building	Instructor
156f	U. S., Reconstruction....	VI-VII	WF	218aLib	Shippee
157w-158s	Topics, 19th Century....	VII-VIII	TTh	1[illegible]Lib	Ford, Tyler
160	Topics, American Colonial	VI-VII	MW	A[illegible]	Alvord
162f	Begin. of Parliament....	VII-VIII	TTh	112Lib	White
164w	Studies in Crusades.....	VII-VIII	TTh	218aLib	Krey
166f	Topics, Hist. of Immigra.	VI-VII	TTh	218bLib	Stephenson

HOME ECONOMICS

No.	Title	Hour	Day	Building	Instructor
3f,w	Textiles	I, II	TWThFS	211, 307HE	Phelps, Weller
3s	Textiles				
	Section 1	I, II	TWThFS	211, 307HE	Phelps, Brown
	2	V, VI	MTWThF	211, 307HE	Phelps, Brown
4f,w,s	Textiles (S. L. A., and Educ.)	V, VI	MWF	211, 307HE	Phelps, Weller
11f,w,s	Garment-Making				
	Section 1	V, VI, VII	TTh	304HE	Phelps, Weller
	2	V, VI	MWF	304HE	Phelps, Weller
13f,w,s	Dressmaking	III, IV	MTWFS	305HE	Patchin, McDowell
17f	Adv. Clothing Construction...				
	Section 1	V, VI, VII	TTh	305HE	Weller, Carlotta Brown
	2	V, VI	MWF	305HE	Weller, Carlotta Brown
17w,s	Adv. Clothing Construction...	V, VI, VII	TTh	305HE	Weller, Carlotta Brown
20f,w,s	Foods and Cookery (S. L. A.)	V, VI	MWF	203, 209HE	Vermilye, Stinson
21f	Foods and Cookery.....	V, VI	MTWThF	207, 309HE	Stinson, Child
21w,s	Foods and Cookery.....				
	Section 1	V, VI	MTWThF	207, 309HE	Stinson, Child
	2	III, IV	MTWFS	106, 207HE	Stinson, Child
22f,w,s	Food Economics.....	I, II	TWThFS	203, 205, 207HE	Stinson
23f,w	Nutrition I	V, VI, VII, VIII	MWF	211, 213HE	Mumford
23s	Nutrition I	I, II	MTWThF	211, 213HE	Anderson
34f,w,s	Home Management: Operation and Maintenance, Lectures.	VII	MWF	213HE	Mumford, Vermilye
37f,s	Home Care of the Sick.....				
	Lect.	I	S	213HE	Moorhead, Fisher
	Lab.	V, VI	TTh	WH	Moorhead, Fisher
40f	Child-Training	IV	MWF	313HE	Binzel
51f	Drawing and Design.....				
	Section 1	V, VI, VII	TTh	400HE	V. Goldstein
	2	V, VI	MWF	400HE	V. Goldstein
51w,s	Drawing and Design.....	V, VI, VII	TTh	307, 400HE	V. Goldstein, Bacon

No.	Title	Credits	Offered to	Prerequisite courses
52	Art Hist. and Appreciation..	3	Jr., sr.	51
53	Advanced Design	4	Jr., sr.	51
70	Food Preparation in Relation to Social Work.....	3	Soph.,§ jr., sr.	An. Biol. 1-2, chem. 10 cr. advised
71	Elementary Dietetics for the Social Workers	3	Soph.,§ jr., sr.	70, Physiol. 3 or parallel
72	Home Management Problems	3	Soph.,§ jr., sr.	71, Econ. 7 or parallel
	Advanced Courses			
123	Clothing Economics	2	Jr., sr.	13, 52, 53, Econ. 7

HUMAN ANATOMY

Students in this college may elect courses in human anatomy (see Medical School program) only by arrangement with the head of the Department of Anatomy.

HUMAN PHYSIOLOGY

MEDICAL SCHOOL

No.	Title	Credits	Offered to	Prerequisite courses
1-2-3	Physiology and Hygiene....	6	All	Biol. and chem.
4	Human Physiology.....	5	All	Biol. and chem.
6	Physiologic Chemistry.....	3	All	Org. chem.
7	Physiology	6	All	An. biol. or anat. and chem.
100-101	Physiologic Chemistry.....	12	Jr., sr.	Org. chem.
103	Physiology of Muscles, etc..	8	Jr., sr.	An. biol. and org. chem.
104	Physiology of Nerv. System, etc.	8	Jr., sr.	An. biol. and org. chem.
110	Physical Ch. Vital Phenomena	3	Jr., sr.	An. biol. and org. chem.
111	Mineral Metabolism.....	3	Jr., sr.	110 or ar
112	Vitamines	3	Jr., sr.	111 or ar
113	Problems in Physiology.....	Ar	Jr., sr.	103 or ar
131	Adv. Physiol. of Muscle, Blood, etc.....	3	Jr., sr.	103
132	Adv. Physiol. of Nerv. Syst., etc.	3	Jr., sr.	104
137	Foods and Pract. Diet.....	2	Jr., sr.	100-101
138	Physiol. of Devel.....	2	Jr., sr.	Embryology
153	Adv. Physiol. Chem.....	Ar	Jr., sr.	100-101
154	Gastro-Intestinal Analysis...	2	Jr., sr.	100-101
155	Experimental Acidosis.....	2	Jr., sr.	100-101
156	Biochemistry of Teeth.....	2	Jr., sr.	100-101
161	Urinalysis	3	Jr., sr.	100-101
162	Analysis of Blood.....	3	Jr., sr.	100-101
163	Metabolism	3	Jr., sr.	100-101

§ Open to sophomores only in their third quarter. Not open to students in Home Economics except by special permission of the head of the division.

No.	Title	Hour	Day	Building	Instructor
52f	Art Hist. and Appreciation...				
	Section 1	II	MWF	401HE	H. Goldstein
	2	VII	MWF	400HE	V. Goldstein
52w,s	Art Hist. and Appreciation...	II	MWF	401HE	H. Goldstein
53f	Advanced Design				
	Section 1	I, II	MWThF	400HE	H. Goldstein
	2	III, IV	MTWF	401HE	V. Goldstein
53w	Advanced Design				
	Section 1	I, II	MWThF	400HE	H. Goldstein
	2	V, VI, VII	MWF	400HE	V. Goldstein
53s	Advanced Design	III, IV	MTWF	400HE	V. Goldstein
70w	Food Preparation in Relation to Social Work.....	V, VI, VII	TTh	103, 213HE	Lindquist
71s	Elementary Dietetics for Social Workers	V, VI	MWF	103, 106HE	Mumford
72f	Home Management Problems..	V, VI	MWF	HE	Lindquist
123f,w,s	Clothing Economics.....	III	MWF	309HE	Weller

HUMAN ANATOMY

Students in this college may elect courses in human anatomy (see Medical School program) only by arrangement with the head of the Department of Anatomy.

HUMAN PHYSIOLOGY

COLLEGE OF MEDICINE

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s	Physiology and Hygiene..	II, III, IV	S	315MH	Beard
4f-w-s	Human Physiology.....	I, II, III	S	315MH	Greisheimer
		I	M-F	301MH	Greisheimer
6s	Physiologic Chemistry....	Ar	Ar	310MH	Pettibone
7s	Physiology	Ar	Ar	301MH	Scott
100f-101w	Physiologic Chemistry....	I, II, III	TThS	310MH	Pettibone, Kingsbury
103f	Physiology of Muscles, etc.	IV, V, VI, VII	MWF	301MH	Scott, et al.
104w	Physiol. of Nerv. Sys., etc.	IV, V, VI, VII	MWF	301MH	Scott, et al.
110f	Physical Ch. Vital Phenomena	V, VI, VII	TTh	303MH	McClendon
111w	Mineral Metabolism.....	V, VI, VII	TTh	303MH	McClendon
112s	Vitamines	V, VI, VII	TTh	303MH	McClendon
113f,w,s	Prob. of Physiology.....	Ar	Ar	MH	Ar
131w	Adv. Physiol. of Muscle, Blood, etc.	V, VI, VII	TTh	315MH	Scott
132s	Adv. Physiol. of Nerv. Syst., etc.	V, VI, VII	TTh	315MH	Scott
137f	Foods and Pract. Diet...	Ar	Ar	MH	Beard
138w	Physiol. of Devel.....	Ar	Ar	MH	Beard
153f,w,s	Adv. Physiol. Chem.....	Ar	Ar	310MH	Pettibone or Kingsbury
154f	Gastro-Intestinal Analysis.	V, VI, VII	TTh	303MH	McClendon
155w	Experimental Acidosis....	V, VI, VII	TTh	303MH	McClendon
156s	Biochemistry of Teeth....	VI, VII, VIII	TTh	303MH	McClendon
161f	Urinalysis	V, VI, VII	TTh	310MH	Pettibone
162w	Analysis of Blood.....	V, VI, VII	TTh	310MH	Pettibone
163s	Metabolism	VI, VII, VIII	TTh	310MH	Pettibone

JOURNALISM

No.	Title	Credits	Offered to	Prerequisite courses
13-14-15†	Reporting	9	Soph., jr., sr.	One year rhet.
51-52†	Editing	6	Jr., sr.	13-14-15
55	Special Feature Stories	3	Jr., sr.	13-14-15
61	Editorial-Writing	3	Sr.	Econ. 3-4, Pol. Sci. 1, Hist. 1-2, Soc. 1
65	Newspaper Problems	3	Sr.	51-52 (16-17) or 55 (25)
67	Pract. Newspaper Work	1, 2, or 3	Sr.	51-52 (16-17) or 55 (25)

LATIN

Junior College Courses

No.	Title	Credits	Offered to	Prerequisite courses
1-2†	Beginning Latin	10	All	None
3	Caesar	5	All	1-2, or 1 yr. Latin
11-12†	Selections	10	All	1-2, 3, or 2 or 3 yrs. Latin
13	Ovid	5	All	1-2, 3, or 2 or 3 yrs. Latin
21	Livy	5	All	Any 2 of 11, 12, 13, or 4 yrs. Latin
22	Plautus and Terence	5	All	Any 2 of 11, 12, 13, or 4 yrs. Latin
23	Horace	5	All	Any 2 of 11, 12, 13, or 4 yrs. Latin

Students entering second quarter. Students with two or three years of Latin may elect 12w. Students with four years of Latin may elect 32w.

Students entering third quarter. Students with two or three years of Latin may elect 13s. Students with four years of Latin may elect 23s.

Senior College Courses

No.	Title	Credits	Offered to	Prerequisite courses
51	Pliny's Letters	3	Jr., sr.	Any 2 of 21, 22, 23, or equiv.
52	Apuleius, Short Stories	3	Jr., sr.	Any 2 of 21, 22, 23, or equiv.
53	Suetonius, Selected Lives	3	Jr., sr.	Any 2 of 21, 22, 23, or equiv.
61	Roman Literature and Life	3	Jr., sr.	Any 2 of 21, 22, 23, or equiv.
[121	Advanced Virgil	3	Jr., sr., grad.	Any 2 of 51, 52, 53, or equiv.]
122	Cicero's Letters	3	Jr., sr., grad.	Any 2 of 51, 52, 53, or equiv.
123	Medieval Latin	3	Jr., sr., grad.	Any 2 of 51, 52, 53, or equiv.

† The entire course must be completed before credit is received for any quarter.

[ ] Not offered in 1920-21.

NOTE: Courses 51, 52, and 53 are open without petition to sophomores who have the prerequisites and who satisfy the requirements given on page 18.

JOURNALISM

No.	Title	Hour	Day	Building	Instructor
13f-14w-15s†	Reporting	I	MWF	321F	Radder
51f-52w†	Editing	V-VI	MW		
		V	F	321F	Radder
55s	Special Feature Stories...	V	MWF	321F	Radder
61f	Editorial Writing.....	II	MWF	321F	Radder
65w	Newspaper Problems.....	II	MWF	321F	Radder
67s	Practical Newspaper Work	Ar	Ar	320F	Radder

LATIN

Junior College Courses

No.	Title	Hour	Day	Building	Instructor
1f-2w†.	Beginning Latin.....	IV	MTWFS	109F	Cram
1w-2s	Beginning Latin.....	VI	MTWThF	109F	Cram
3s	Caesar	IV	MTWFS	109F	Cram
11f-12w†	Selections	III	MTThFS	109F	Cram
13s	Ovid	III	MTThFS	109F	Cram
21f	Livy	IV	MTThFS	107F	Pike
22w	Plautus and Terence.....	IV	MTThFS	107F	Pike
23s	Horace	IV	MTThFS	107F	Pike

Senior College Courses

51f	Pliny's Letters	I	MWF	107F	Pike
52w	Apuleius, Short Stories...	I	MWF	107F	Pike
53s	Suetonius, Selected Lives.	I	MWF	107F	Pike
61f	Roman Literature & Life	VI	MWF	109F	Cram
122w	Cicero's Letters.....	II	MWF	107F	Pike
123s	Medieval Latin.....	II	MWF	107F	Pike

† The entire course must be completed before credit is received for any quarter.

No.	Title	Credits	Offered to	Prerequisite courses
131	Juvenal	3	Jr., sr., grad.	Any 2 of 51, 52, 53, or equiv.
[132	Seneca's Epistles	3	Jr., sr., grad.	Any 2 of 51, 52, 53, or equiv.]
[133	Petronius and Vulgar Latin.	3	Jr., sr., grad.	Any 2 of 51, 52, 53, or equiv.]
[201-202-203	Grad. Sem. Anns. of Tacitus I-VI	3]		
[211-212-213	Grad. Sem. Lucretius.....	3]		
221-222-223	Grad. Sem. Anns. of Tacitus XI-XVI	3	Sr. (major in Latin), grad.	Consult instructor

MATHEMATICS

Junior College Courses

No.	Title	Credits	Offered to	Prerequisite courses
1	Higher Algebra	5	All	1 yr. elem. alg.
6	Trigonometry	5	All	1, or prep. high. alg.
7	College Algebra	5	All	6
8	Commerce Algebra	5	Pre-bus. stu.	1, or prep. high. alg.
16	Solid Geometry	5	All	6 and 7
20	Mathematics of Investment..	5	All	8, or 6 and 7
30	Analytical Geometry	5	All	6 and 7

[ ] Not offered in 1920-21.

No.	Title	Hour	Day	Building	Instructor
131f	Juvenal	II	MWF	107F	Pike
221-222-223	Grad. Seminar Anns. of Tacitus XI-XVI.....	Ar	Ar	108F	Pike

MATHEMATICS

Most of the courses in mathematics are listed in sequences extending over two or three quarters. But the student who does not desire the whole sequence may take and receive credit for any part of it for which he has had the prerequisites.

No.	Title	Hour	Day	Building	Instructor
1f-6w-7s	Higher Alg., Trig., Coll. Alg.	II	MWThFS	104F	Ar
		IV	MTWFS	104F	Ar
		VII	MTWThF	104F	Ar
1f-8w-20s	Higher Alg., Commerce Alg., Math. of Invest..	II	MWThFS	101F	Ar
1w-6s	Higher Alg., Trig.....	IV	MTWFS	105F	Ar
		VII	MTWThF	105F	Ar
1s	Higher Algebra.....	III	MTThFS	104F	Ar
		VI	MTWThF	104F	Ar
6f	Trigonometry	II	MWThFS	105F	Ar
6f-7w	Trig., College Alg.....	I	TWThFS	104F	Ar
		III	MTThFS	104F	Ar
		VI	MTWThF	104F	Ar
6f-7w-30s	Trig., College Alg., Anal. Geom.	I	TWThFS	102F	Ar
6w	Trig. See 1f-6w-7s.....				
6s	Trigonometry ..... See also 1w-6s	I	TWThFS	105F	Ar
7f-30w-50s	Coll. Alg., Anal. Geom., Calc. I.....	I	TWThFS	125F	Underhill
7w	Coll. Alg. See 6f-7w and 6f-7w-30s				
7s	Coll. Alg. See 1f-6w-7s..				
8f-20w	Commerce Alg., Math. of Investment	I	TWThFS	105F	Hart
8w	Commerce Algebra. See 1f-8w-20s				
16s	Solid Geometry	VII	MTWThF	101F	Ar
20w	Math. of Invest. See 8f-20w				
20s	Math. of Invest. See 1f-8w-20s				
30f-50w-51s	Anal. Geom., Calc. I, II	VI	MTWThF	105F	Brink

Senior College Courses

No.	Title	Credits	Offered to	Prerequisite courses
50	Calculus I	5	Jr., sr.	30
51	Calculus II	5	Jr., sr.	50
52	Calculus III	5	Jr., sr.	51
62-63	Theory of Equations	6	Jr., sr.	50
70	History of Elem. Math	3	Jr., sr.	30
71	Solid Analytic Geom	3	Jr., sr.	50
80-81-82	Mechanics	9	Jr., sr.	50 and 51§
[102-103-104	Adv. Analytic and Synthetic Geom.	9	Jr., sr., grad.	50]
106-107-108	Adv. Calc. and Differential Equations	9	Jr., sr., grad.	52
140‡	Method of Least Squares	3	Jr., sr., grad.	51

NOTE: Courses 50, 51, and 52 are open without petition to sophomores who have the prerequisites and who satisfy the requirements given on page 18.

Courses in Functions of a Real Variable, Modern Higher Algebra, Projective Geometry, and Differential Geometry, listed in the Graduate School bulletin, are open to properly qualified juniors and seniors. For more information consult the chairman of the Department of Mathematics.

§ Course 80-81-82 may be taken simultaneously with Course 50-51.

‡ Identical with Astronomy 140.

[ ] Not offered in 1920-21.

MILITARY TACTICS AND SCIENCE

No.	Title	Credits	Offered to	Prerequisite courses
1-2-3	First-Year Basic Course R.O.T.C.	None	Fr.	None
4-5-6	Second-Year Basic Course R.O.T.C.	None	Soph.	1-2-3
51-52-53	First-Year Advanced Course R.O.T.C.	(‡)	Jr.	4-5-6
54-55-56	Second-Year Advanced Course R.O.T.C.	(§)	Sr.	51-52-53

‡ Must be legally eligible for enrollment in Reserve Officers' Training Corps. Consult Commandant.

§ Now under consideration by University authorities.

MUSIC

NOTE: Only courses with 15 credits prerequisite will count as Senior College courses.

No.	Title	Credits	Offered to	Prerequisite courses
1-2-3†	Harmony	9†	Fr., music	None
4-5-6†	Counterpoint	6†	Fr., music	1-2-3
7-8-9‡	Ear-Training	no. cr.	Soph. music	1-2-3
10-11-12	Composition	6	Jr., sr.	Consent of head of dept.
11-12-13	Analysis	3	Jr., sr.	1-2-3
14-15-16†	History of Music	9†	Jr., sr.	None
17-18-19†	Appreciation of Music	3†	Jr., sr.	None
20-21-22†	Bach and Beethoven	6†	Jr., sr.	14-15-16
25-26-27§	Ensemble	3	Jr., sr.	
28-29-30	First-Year Organ	6	Fr., music	
31-32-33	Second-Year Organ	6	Soph. music	
34-35-36	Third-Year Organ	6 or 12	Jr.	
37-38-39	Fourth-Year Organ	6 or 12	Sr.	
39-40-41	First-Year Pianoforte	6 or 12	Fr. music	

† The entire course must be completed before credit is received for any quarter.

‡ Required of music students without credit.

§ Required two periods with one credit.

No.	Title	Hour	Day	Building	Instructor
30w	Analytic Geometry. See 7f-30w-50s				
30s	Analytic Geometry. See 6f-7w-30s				
50f-51w-52s	Calculus I, II, III.....	III	MTThFS	102F	Jackson
50w	Calc. I. See 30f-50w-51s..				
50s	Calc. I. See 7f-30w-50s..				
51w	Calc. II. See 50f-51w-52s.				
51s	Calc. II. See 30f-50w-51s.				
52f	Calculus III.....	III	MTThFS	101F	Underhill
52s	Calc. III. See 50f-51w-52s				
62w-63s	Theory of Equations.....	VI	MWF	101F	Bussey
70s	Hist. of Elem. Math.....	I	MWF	101F	Shumway
71f	Solid Anal. Geom.....	VI	MWF	101F	Bussey
80f-81w-82s	Mechanics	II	MWF	102F	Jackson
106f-107w-108s	Adv. Calc. and Differ. Equations	III	MWF	125F	Brink
140w,s	See Astronomy.				

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s	First-Year Basic Course..	II	MWF	A	Ar
		IV	MWF	A	Ar
		V	MWF	A	Ar
		VI	MWF	A	Ar
		VIII	MWF	A	Ar
4f-5w-6s	Second-Year Basic Course	I	MWF	A	Ar
		III	MWF	A	Ar
		VII	MWF	A	Ar
51-52-53	First-Year Adv. Course..	Ar	Ar	Ar	Ar
54-55-56	Second-Year Adv. Course	Ar	Ar	Ar	Ar

MUSIC

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s†	Harmony	II	MWF	Mu	Ar
		V	MWF	Mu	Ar
4f-5w-6s†	Counterpoint	III	TTh	Mu	Ar
7f-8w-9s	Ear-Training	V	T	Mu	Ar
10f-11w-12s	Composition	Ar	Ar	Mu	Ar
11f-12w-13s	Analysis	IV	W	Mu	Ar
14f-15w-16s†	History of Music.....	II	MWF	Mu	Ar
17f-18w-19s†	Appreciation of Music...	V	M	Mu	Ar
20f-21w-22s†	Bach and Beethoven.....	V, VI	T	Mu	Ar
25f-26w-27s	Ensemble	Ar	Ar	Mu	Ar
28f-29w-30s	First-Year Organ.....	Ar	Ar	Mu	Ar
31f-32w-33s	Second-Year Organ.....	Ar	Ar	Mu	Ar
34f-35w-36s	Third-Year Organ.....	Ar	Ar	Mu	Ar
37f-38w-39s	Fourth-Year Organ.....	Ar	Ar	Mu	Ar
39f-40w-41s	First-Year Piano.....	Ar	Ar	Mu	Ar

† The entire course must be completed before credit is received for any quarter.

No.	Title	Credits	Offered to	Prerequisite courses
42-43-44	Second-Year Pianoforte.....	6 or 12	Soph. music	
45-46-47	Third-Year Pianoforte.....	6 or 12	Jr.	
48-49-50	Fourth-Year Pianoforte.....	6 or 12	Sr.	
51-52-53	First-Year Violin.....	6 or 12	Fr. music	
54-55-56	Second-Year Violin.....	6 or 12	Soph. music	
57-58-59	Third-Year Violin.....	6 or 12	Jr.	
60-61-62	Fourth-Year Violin.....	6 or 12	Sr.	
63-64-65	First-Year Vocal Training...	6	Fr., music	
66-67-68	Second-Year Vocal Training.	6	Soph. music	
69-70-71	Third-Year Vocal Training..	6 or 12	Jr.	
72-73-74	Fourth-Year Vocal Training.	6 or 12	Sr.	
81-82-83†	Normal Piano.....	9†	Jr., sr.	
84-85-86†	Adv. Normal Piano.....	9†	Sr.	81-82-83
88-89-90¶	Ear-Training	no. cr.	Jr., music	7-8-9
91-92-93	Orchestra	3	Jr., sr.	
94-95-96	Other Orchestral Instruments	6 or 12	Jr., sr.	
97-98-99	University Choir	3	Jr., sr.	Consent of head of dept.
100-101-102†	Romantic Movement.....	9	Jr., sr.	14-15-16
103-104-105†	Advanced Harmony.....	6	Jr., sr.	1-2-3
106-107-108†	Advanced Counterpoint.....	6	Sr.	4-5-6

PHILOSOPHY

Nine credits in psychology will be accepted as prerequisites in philosophy, except where "cr. in phil." are required.

No.	Title	Credits	Offered to	Prerequisite courses
1	Problems of Philosophy.....	5	3rd qu. fr., soph., jr., sr.	None
2	Logic	5	Soph., jr., sr.	None
3	Ethics	5	Soph., jr., sr.	None
[10	Science and Religion.....	2	Soph., jr., sr.	10 cr. in phil. or a science]
50-51	Present-Day Philosophy.....	6	Jr., sr.	10 credits
55	Esthetics	3	Jr., sr.	10 credits
100-101-102	Philosophy of Religion.....	9	Jr., sr., grad.	10 credits phil.
[104	History of Esthetics.....	3	Jr., sr., grad.	10 credits]
106	Philosophy of Education....	3	Sr., grad.	10 cr. in phil. or educ.
108-109	History of Ethics.....	6	Jr., sr., grad.	15 cr. in soc. sci. or 10 in phil.
113-114-115	History of Philosophy.....	9	Jr., sr., grad.	10 credits
[120	Scandinavian Philosophy.....	3	Jr., sr., grad.	10 credits]
124	Political and Social Ethics...	5	Jr., sr., grad.	15 cr. in soc. sci. or 10 in phil.
129	Modern Political Thought...	3	Jr., sr., grad.	15 cr. in soc. sci. or 10 in phil.
135	Philosophy of Plato.....	4	Jr., sr., grad.	10 credits
141	Metaphysics	3	Jr., sr., grad.	10 cr. in phil., including 2
[147	Advanced Logic	3	Jr., sr., grad.	10 cr. in phil., including 2]
151-152-153	Kant and His Successors....	6	Sr., grad.	15 cr. in phil.
161-162-163	Seminar in Philosophy.....	9	Sr., grad.	20 cr. in phil.

† The entire course must be completed before credit is received for any quarter.

¶ Junior music students may be excused from 88-89-90 if they pass a satisfactory examination at the end of the sophomore year.

[ ] *Not offered in 1920-21.*

NOTE: All music courses are open to juniors and seniors of the College of Science, Literature, and the Arts with the required prerequisites.

No.	Title	Hour	Day	Building	Instructor
42f-43w-44s	Second-Year Piano.....	Ar	Ar	Mu	Ar
45f-46w-47s	Third-Year Piano.....	Ar	Ar	Mu	Ar
48f-49w-50s	Fourth-Year Piano.....	Ar	Ar	Mu	Ar
51f-52w-53s	First-Year Violin.....	Ar	Ar	Mu	Ar
54f-55w-56s	Second-Year Violin.....	Ar	Ar	Mu	Ar
57f-58w-59s	Third-Year Violin.....	Ar	Ar	Mu	Ar
60f-61w-62s	Fourth-Year Violin.....	Ar	Ar	Mu	Ar
63f-64w-65s	First-Year Vocal Training	Ar	Ar	Mu	Ar
66f-67w-68s	Second-Year Vocal Train.	Ar	Ar	Mu	Ar
69f-70w-71s	Third-Year Vocal Train.	Ar	Ar	Mu	Ar
72f-73w-74s	Fourth-Year Vocal Train.	Ar	Ar	Mu	Ar
81f-82w-83s†	Normal Piano.....	VI	MWF	Mu	Ar
84f-85w-86s†	Adv. Normal Piano.....	VII	MWF	Mu	Ar
88f-89w-90s	Ear Training.....	V	Th	Mu	Ar
91f-92w-93s	Orchestra	7:30	W	Armory	Ar
94f-95w-96s	Other Orchestral Inst....	Ar	Ar	Mu	Ar
97f-98w-99s	University Choir.....	VIII	M	Mu	Ar
100-101-102†	Romantic Movement.....	VI	MWF	Mu	Ar
103f-104w-105s†	Advanced Harmony.....	Ar	Ar	Mu	Ar
106f-107w-108s†	Advanced Counterpoint...	Ar	Ar	Mu	Ar

PHILOSOPHY

No.	Title	Hour	Day	Building	Instructor
1f	Problems of Philosophy..	IV	MTWFS	321F	Lodge
1w	Problems of Philosophy..	III	MTThFS	321F	Swenson
1s	Problems of Philosophy..	VI	MTWThF	321F	Lodge
2f	Logic	III	MTThFS	321F	Swenson
2w	Logic	IV	MTWFS	321F	Lodge
2s	Logic	III	MTThFS	5F	Swenson
3f	Ethics	I	TWThFS	322F	Wilde
3s	Ethics	I	TWThFS	322F	Wilde
50f-51w	Present-Day Philosophy...	III	TThS	322F	Wilde
55s	Esthetics	II	MWF	322F	Swenson
100f-101w-102s	Philosophy of Religion....	II	TThS	322F	Swenson
106w	Philosophy of Education..	II	MWF	322F	Swenson
108f-109w	History of Ethics.....	III	MWF	322F	Lodge
113f-114w-115s	History of Philosophy....	IV	MWF	322F	Wilde
124w	Political and Social Ethics	I	TWThFS	322F	Wilde
129s	Modern Political Thought.	III	TThS	322F	Wilde
135s	Plato	VI, VII	TTh	316F	Lodge
141f	Metaphysics	Ar	Ar	316F	Swenson
151f-152w-153s	Kant	Ar	Ar	316F	Lodge
161f-162w-163s	Seminar	Ar	Ar	316F	Lodge

† The entire course must be completed before credit is received for any quarter.

PHYSICAL EDUCATION

FOR MEN

No.	Title	Credits	Offered to	Prerequisite courses
1	Personal Hygiene.....	None	Fr.	None
2	Gymnasium and Swimming..	None	Fr.	None
3	Advanced Leaders.....	2	Soph., jr., sr.	Instructor's permission
4	Corrective Gymnastics	None	All	None
5	Wrestling	None	All	Instructor's permission
6	Intermediate Swimming.....	None	All	Instructor's permission
7	Advanced Swimming.....	None	All	Instructor's permission
8	Boxing	None	Fr.	Instructor's permission
9	Intramural Athletics.....	None	All	None

PHYSICAL EDUCATION

FOR WOMEN

No.	Title	Credits	Offered to	Prerequisite courses
1-2-3‡	Elem. Phys. Training.....	0	Required of all new students	None
11	Preliminary Hygiene	0	Required of all new students	None
13	Personal Hygiene	3	Soph., jr., sr.	An. Biol. 1-2
19-20-21	Rhythmic Expression	0	Fr., jr., sr.	None
22-23-24	Soph. Rhythmic Expression..	0	Soph.	1-2-3
25-26-27	Soph. Phys. Training.....	0	Soph.	1-2-3
31-32-33	Folk Dancing and Organized Games	0	Fr., jr., sr.	None
37-38-39	Soph. Organized Games and Folk Dancing	0	Soph.	1-2-3
40	Soph. Major Sports.....	0	Soph.	1-2-3
43	Soph. Elem. Swimming.....	0	Soph.	1-2-3
44	Soph. Adv. Swimming.....	0	Soph.	1-2-3
54-55-56†‡	Intermed. Phys. Train.....	4½	Jr., sr.	Equiv. of 1-2-3, 25-26-27; permission of director
57-58-59†‡	Adv. Phys. Train.	4½	Sr.	54-55-56; permission of director
64	Hygiene of the Family.....	3	Jr., sr.	13

† The entire course must be completed before credit is received for any quarter.

‡ The third quarter of these courses is open to students who have not had the first two quarters.

PHYSICAL EDUCATION

FOR MEN

No.	Title	Hour	Day	Building	Instructor
1	Personal Hygiene and				
2	Gymnasium				
	Section 1	II	TTh	A	Cooke, Roemer, Glidden
	2	III	TTh	A	Cooke, Roemer, Glidden
	3	V	TTh	A	Brown, Roemer, Glidden
	4	VI	TTh	A	Brown, Roemer, Glidden
	5	VII	TTh	A	Foster, Roemer, Glidden
3‡	Advanced Leaders.....	Ar	TThS	A	Foster, Roemer
4‡	Corrective Gymnastics	Ar	Ar	A	Brown
5‡	Wrestling	Ar	Ar	A	Gilman
6‡	Intermediate Swimming	Ar	Ar	A	Glidden
7‡	Advanced Swimming	Ar	Ar	A	Foster, Glidden
8‡	Boxing	Ar	Ar	A	Goldie
9‡	Intramural Athletics.....	Ar	Ar	A	Foster

‡ No student may register for Courses 3 to 9 inclusive except with the consent of the department. The full course must be completed before credit is allowed.

PHYSICAL EDUCATION

FOR WOMEN

No.	Title	Hour	Day	Building	Instructor
1f-2w-3s‡	Elem. Phys. Training....	IV	MWF	3, 151, 153WGm	Ar
		VI	MWF	3, 151, 153WGm	Ar
		VII	MWF	3, 151, 153WGm	Ar
		III	TThS	3, 151, 153WGm	Ar
11f	Preliminary Hygiene.....	I	M	201WGm	Norris
		VII	M	201WGm	Norris
		VI	T	201WGm	Norris
		VII	T	201WGm	Norris
		III	W	201WGm	Norris
13w	Personal Hygiene.....	II	MWF	201WGm	Norris
19f-20w-21s	Rhythmic Expression.....	II	MW	153WGm	Ladd
22f-23w-24s	Soph. Rhythmic Express..	IV	TS	151WGm	Ladd
		VII	TTh	151WGm	Ladd
		VIII	TTh	151WGm	Ladd
25f-26w-27s	Soph. Phys. Training....	III	WF	3, 153WGm	Schill
		IV	TS	3, 153WGm	Schill
		V	TTh	3, 153WGm	Schill
31f-32w-33s	Folk Dancing and Organ. Games	V	TTh	151WGm	Ar
37f-38w-39s	Soph. Org. Games and Folk Dancing.....	II	TTh	151WGm	Ar
40f,w,s	Soph. Major Sports.....	VIII	MW	151WGm	Ar
43f,w,s	Soph. Elem. Swimming..	IV	MW	51WGm	Ar
		VI	MW	51WGm	Ar
		IV	TS	51WGm	Ar
		VI	TTh	51WGm	Ar
44f,w,s	Soph. Adv. Swimming...	VII	MW	51WGm	Ar
		VII	TTh	51WGm	Ar
		VII	TTh	51WGm	Ar
54f-55w-56s†‡	Intermed. Phys. Training.	VI	TTh & Ar	153WGm	Ar
57f-58w-59s†‡	Adv. Phys. Training.....	VII	TTh & Ar	153WGm	Schill
64s	Hygiene of the Family...	II	MWF	201WGm	Norris

† The entire course must be completed before credit is received for any quarter.
‡ The third quarter is open to students who have not taken the preceding quarters.

Courses for which no registration is necessary

No.	Title	Credits	Offered to	Prerequisite courses
34-35-36	Hockey, Basket-Ball, and Baseball	0	Fr., jr., sr.	Permission of director
45	General Swimming	0	All	None

NOTE: Any course in exercise may be entered any quarter by obtaining permission of the department.

PHYSICS

Introductory Courses

No.	Title	Credits	Offered to	Prerequisite courses
1	Elem. of Mechanics and Sound	3	All	Trig.
2	Elem. of Mechanics Lab	1	All	1 or reg. in 1
9	Acoustics	3	All	None
21	Heat	3	All	1
22	Heat Laboratory	1	All	2, 21 or reg. in 21
31	Optics	3	All	1
32	Optics Laboratory	1	All	2, 31 or reg. in 31
41	Magnetism and Electricity	3	All	1
42	Electrical Laboratory	1	All	2, 41 or reg. in 41

For equivalent courses see bulletin of the College of Engineering and Architecture.

Intermediate Courses

101-103-105	Theoretical Physics	4	Jr., sr., grad.	12 cr. in phys.; Math. 51
102-104-106	Experimental Physics	3	Jr., sr., grad.	12 cr. in physics; Math. 51
111-113-115	Elem. of Math. Physics	3	Jr., sr., grad.	105, Math. 51
112-114-116	Elem. Phys. Investigation	3	Jr., sr., grad.	106, Math. 51
122	Pyrometry and Heat	3	Jr., sr., grad.	21 and 22
132	Applied Optics	3	Jr., sr., grad.	31 and 32
142	Electrical Measurements	3	Jr., sr., grad.	41 and 42
146	Elec. Measure of Precision	3	Jr., sr., grad.	142
145-147-148	Radioactivity	3	Jr., sr., grad.	106

Courses for which no registration is required

No.	Title	Hour	Day	Building	Instructor
34f-35w-36s	Hockey, Basket-Ball, Baseball	VIII	TTh	151WGm	Ar
45	General Swimming	VIII	MTWThF		No instructor

NOTE: Any course in exercise may be entered any quarter by obtaining permission of Department.

PHYSICS

No.	Title	Hour	Day	Building	Instructor
1f,w,s	Elem. of Mechanics and Sound				
	Lect.	VII	MWF	30Ph	Erikson
	Quiz.	VII or V	Th	30Ph	Erikson
2f,w,s	Elem. of Mech. Lab.				
	Section 1	V-VI	T	16Ph	Erikson & Assts.
	2	VII-VIII	T	16Ph	Erikson & Assts.
	3	V-VI	Th	16Ph	Erikson & Assts.
	4	VII-VIII	Th	16Ph	Erikson & Assts.
9s	Acoustics	III	TThS	30Ph	Erikson
21f	Heat				
	Lect.	III	TThS	30Ph	Miller
	Quiz.	V	T	30Ph	Miller
22f	Heat Laboratory				
	Section 1	V-VI	M	23Ph	Miller & Assts.
	2	VII-VIII	M	23Ph	Miller & Assts.
	3	V-VI	T	23Ph	Miller & Assts.
	4	VII-VIII	T	23Ph	Miller & Assts.
31f,s	Optics				
	Lect.	I	TThS	30Ph	Valasek
	Quiz.	V	Th	30Ph	Valasek
32f,s	Optics Laboratory				
	Section 1	V-VI	Th	23Ph	Valasek
	2	VII-VIII	Th	23Ph	Valasek
	3	V-VI	F	23Ph	Valasek
	4	VII-VIII	F	23Ph	Valasek
41w	Magnetism and Electricity				
	Lect.	I	TThS	30Ph	Zeleny
	Quiz.	V	T	30Ph	Zeleny
	Lect.	III	TThS	30Ph	Zeleny
	Quiz.	V	Th	30Ph	Zeleny
42w	Electrical Lab.				
	Section 1	V-VI	T	31Ph	Zeleny & Assts.
	2	VII-VIII	T	31Ph	Zeleny & Assts.
	3	V-VI	Th	31Ph	Zeleny & Assts.
	4	VII-VIII	Th	31Ph	Zeleny & Assts.
	5	V-VI	W	31Ph	Zeleny & Assts.
	6	VII-VIII	W	31Ph	Zeleny & Assts.
	Intermediate Courses				
101f-103w-105s	Theoretical Physics	IV	MTWF	16Ph	Tate
102f-104w-106s	Experimental Physics				
	Section 1	V-VII	MW	2Ph	Tate & Assts.
	2	V-VII	TTh	2Ph	Tate & Assts.
111f-113w-115s	Elem. of Math. Physics	Ar	Ar	16Ph	Ar
112f-114w-116s	Elem. Phys. Investigation.	Ar	Ar	11Ph	Swann
121s	Pyrometry and Heat	V-VII	MWF	9Ph	Miller
132w	Applied Optics	Ar	Ar	3Ph	Valasek
142f	Elect. Measure.	See Engineering	Program	31Ph	Zeleny
146w	Elect. Meas. of Precision.	Ar	Ar	12Ph	Zeleny
145f-147w-148s	Radioactivity	Ar	Ar	15Ph	Erikson

POLITICAL SCIENCE

No.	Title	Credits	Offered to	Prerequisite courses
1	American Government.....	5	Soph., jr., sr., and fr. with 10 cr. in history	None
3	Comparative European Govt.	5	Soph., jr., sr.	1
7	State and Local Government	5	Soph., jr., sr., and fr. pre-legals	1
11	Municipal Government.....	5	Soph., jr., sr.	1
15	Introd. to Pol. Sci.....	5	Soph., jr., sr.	1
[21	Colonial Government	5	Soph., jr., sr.	1]
25	World Politics	5	Soph., jr., sr.	1, and 10 cr. in history
[31	Political Parties	5	Soph., jr., sr.	1]
41	Introd. to Study of Law....	5	Soph. pre-legals only	7
51-52-53	Business Law	9	Jr., sr.	10 cr. in pol. sci. or 10 cr. in econ. or 5 cr. in each
58	Elementary Law	5	Jr., sr.	10 cr. in pol. sci. or 5 cr. in pol. sci. & 5 in sociol.
65	Contemp. Political Problems.	3	Jr., sr.	10 cr.
107-108	See History statement			
[109-110	See History statement]			
111	Government of Minnesota...	3	Jr., sr., grad.	1, and 7 or 11 or 31
115	Municipal Problems	3	Jr., sr., grad.	11, or 15 cr.
117	See Civil Engineering 53.38			
121	International Law: Peace...	4	Jr., sr., grad.	10 cr. in pol. sci. or Hist. 107-108
122	International Law: War and Neutrality	4	Jr., sr., grad.	121
123	Development of International Law and Organization....	4	Jr., sr., grad.	122
125	American Diplomatic Hist...	4	Jr., sr., grad.	10 cr. in pol. sci. or Hist. 5-6
127	American Foreign Relations.	4	Jr., sr., grad.	122, or 125, or 15 cr. in pol. sci., incl. 25 and one Sen. Col. course
129	Far Eastern Politics.....	3	Jr., sr., grad.	122, or 125, or 15 cr. in pol. sci., incl. 25, or 10 cr. in pol. sci. & Hist. 107-108
141	State Constitutional Law....	2	Jr., sr., grad.	7, or 111, or 15 cr.
145	Legislative Power and Meth.	3	Jr., sr., grad.	15 cr.
146-147	See History statement			
151	Constitutional Law: The American Federal System..	4	Jr., sr., grad.	15 cr. incl. one Sen. Col. course
152	Constitutional Law: Fundamental Rights & Immunities	4	Jr., sr., grad.	15 cr. incl. one Sen. Col. course
[153	See History statement]			

[ ] Not offered in 1920-21.

POLITICAL SCIENCE

No.	Title	Hour	Day	Building	Instructor
1f	American Government	III	MTThFS	308D	Ar
		VI	MTWThF	109MA	Ar
1w	American Government	II	MWThFS	Ar	Ar
1s	American Government	I	TWThFS	102MA	Ar
		II	MWThFS	Ar	Ar
		IV	MTWFS	202MA	Ar
		VI	MTWThF	Ar	Ar
3f	Comparative European Govt....	III	MTThFS	Ar	Wright
3w	Comparative European Govt....	III	MTThFS	Ar	Quigley
3s	Comparative European Govt....	V	MTWThF	Ar	Quigley
7f	State and Local Government....	VI	MTWThF	209MA	Cushman
		II	MWThFS	Ar	Lobb
7w	State and Local Government....	VI	MTWThF	209MA	Cushman
7s	State and Local Government....	VI	MTWThF	209MA	Cushman
	State and Local Govt., Pre-Legal	III	MTThFS	Ar	Lobb
11f	Municipal Government.....	I	TWThFS	102MA	Anderson
11w	Municipal Government.....	II	MWThFS	102MA	Anderson
15w	Introduction to Political Science	IV	MTWFS	Ar	Quigley
25f	World Politics.....	V	MTWThF	102MA	Tyler, Quigley
25s	World Politics	VI	MTWThF	Ar	Quigley
41f	Introduction to Study of Law..	I	TWThFS	Ar	Lobb
51f-52w-53s	Business Law			Law Aud.	Young
	Lecture	II	WF	Ar	
	Section 1	I	M	Ar	
	2	II	M	Ar	
	3	VI	M	Ar	
	4	VII	M	Ar	
	5	VII	M	Ar	
	6	VIII	M	Ar	
58w	Elementary Law.....	V	MTWThF	Ar	Lobb
65f	Contemporary Political Prob...	II	TThS	102MA	Young
107-108	See History statement				
111w	Government of Minnesota.....	VI	MWF	213MA	Lobb
115s	Municipal Problems.....	II	MWF	213MA	Anderson
117s	See Civil Engineering 53.3				
121f	International Law: Peace.....	IV	MTWF	213MA	Wright
122w	International Law: War and Neutrality	IV	MTWF	213MA	Wright
123s	Development of International Law and Organization.....	IV	MTWF	Ar	Wright
125w	American Diplomatic History...	III	MTWF	Ar	Wright
127s	American Foreign Relations....	III	MTWF	102MA	Wright
129f	Far Eastern Politics.....	VI	MWF	Ar	Quigley
141s	State Constitutional Law.....	IV	MW	213MA	Lobb
145w	Legislative Power and Methods.	III	MWF	102MA	Young
146-147	See History statement				
151w	Constitutional Law: The American Federal System.....	V	MWThF	213MA	Cushman
152s	Constitutional Law: Fundamental Rights and Immunities	V	MWThF	209MA	Cushman

No.	Title	Credits	Offered to	Prerequisite courses
[154	National and State Adminis.	3	Jr., sr., grad.	15 cr. including 1 and 7]
[155	Compar. Administrative Law	5	Jr., sr., grad.	15 cr.]
[157	Police Power	5	Jr., sr., grad.	15 cr. in pol. sci. or econ. or soc.]
158	Government and Business...	3	Jr., sr., grad.	13 cr. in pol. sci. or in econ.
161	Comparative Federal Govt..	3	Jr., sr., grad.	15 cr.
165-166	Govt. of British Empire....	6	Jr., sr., grad.	15 cr. or Hist. 109-110
167	British Politics	3	Jr., sr., grad.	15 cr. or Hist. 109-110
169	See Economics statement			
171	Municipal Corporations.....	3	Jr., sr., grad.	15 cr.
175	Law of Labor.....	4	Jr., sr., grad.	13 cr. in pol. sci. or in econ.
181	Modern Political Thought...	3	Jr., sr., grad.	15 cr. in soc. sci. or 10 cr. in phil.
185	Political and Social Ethics...	5	Jr., sr., grad.	15 cr. in soc. sci. or 10 cr. in phil.
191-192	See Economics statement			
193	See Economics statement			

NOTE: For graduate courses open to properly qualified seniors, see the Graduate School bulletin.

PSYCHOLOGY

NOTE: 1-2-3 and 4-5-6 are required for all courses in psychology except 8, 156, and 160.

No.	Title	Credits	Offered to	Prerequisite courses
1-2†-3	General Psychology	9	Soph., jr., sr.	None
4-5†-6	Introd. Lab. Psychology....	3	Soph., jr., sr.	10 cr. an. biol. In 1920-21 physics, bot., or chem. may be substituted
8	Applications of Psychology to Business	3	Bus., pre-bus.	1-2
101-102-103†	Experimental Psychology....	9	Jr., sr., grad.	1-2-3, 4-5-6

† The entire course must be completed before credit is received for any quarter.
[ ] Not offered in 1920-21.

No.	Title	Hour	Day	Building	Instructor
158w	Government and Business.....	III	TThS	102MA	Young
161w	Comparative Federal Govt.....	VI	MWF	Ar	Allin
165f	Govt. of the British Empire....	III	MWF	213MA	Allin
166w	Govt. of British Empire (cont.)	III	MWF	213MA	Allin
167s	British Politics	III	MWF	213MA	Allin
169	See Economics statement				
171f	Municipal Corporations.....	III	TThS	102MA	Anderson
175f	Law of Labor.....	V	MWThF	213MA	Cushman
181s	Modern Political Thought.....	III	TThS	322F	Wilde
185w	Political and Social Ethics.....	I	M-F	322F	Wilde
191-192	See Economics statement				
193	See Economics statement				

PSYCHOLOGY

NOTE: 1-2-3, 4-5-6 required for all courses in psychology except 8, 156, 160.

No.	Title	Hour	Day	Building	Instructor
1f-2w†	General Psychology.....				
	Lecture 1	I	MW	Lit.Th.	Elliott, Foster
	Lecture 2	VII	MW	Lit.Th.	Elliott, Foster
	Rec. (one hr.)	I	Th or F or S	Psy.	
		II	Th or F or S	Psy.	
		III	Th or F or S	Psy.	
		IV	F	Psy.	
		V	Th or F	Psy.	
		VII	Th or F	Psy.	
3s	General Psychology (cont.)				
	Lecture	I	MW	Lit.Th.	Elliott
	Rec. (one hr.)	I	Th or F or S	Psy.	
		III	Th or F or S	Psy.	
		V	Th or F	Psy.	
		VII	Th or F	Psy.	
4f-5w†-6s	Introd. Lab. Psychol.				
	Section 1	I, II	T	211Psy	Foster et al.
	2	III, IV	T	211Psy	
	3	V, VI	T	211Psy	
	4	VII, VIII	T	211Psy	
8s	Applic. of Psychol. to Business	V	MWF	Psy.Amph.	Morgan
101f-102w-103s†	Exper. Psych.	VI	MWF		
		VII	WF	116Psy	Fernald et al.

† The entire course must be completed before credit is received for any quarter.

No.	Title	Credits	Offered to	Prerequisite courses
108-109†	Adv. General Psychology....	6	Sr., grad.	101-102-103, or by permission
114-115†	Human Behavior.....	6	Jr., sr., grad.	1-2-3, 4-5-6, 10 cr. an. biol.
119-120†	Animal Behavior.....	6	Jr., sr., grad.	1-2-3, 4-5-6, 10 cr. an. biol.
121	Neuro-Psychology	3	Jr., sr., grad.	1-2-3, 4-5-6, 10 cr. an. biol.
125-126†	Differential Psychology.....	6	Jr., sr., grad.	1-2-3, 4-5-6
127-128†	Social Psychology.....	6	Jr., sr., grad.	1-2-3, 4-5-6
131-132†	Child Mind	6	Jr., sr., grad.	1-2-3, 4-5-6
144-145†	Abnormal Psychology.....	6	Jr., sr., grad.	1-2-3, 4-5-6
156	Psychol. of Advertising.....	3	Jr., sr., grad.	1-2-8, Econ. 23
160	Employment Psychology.....	3	Jr., sr., grad.	1-2-8, Econ. 23

NOTE: For graduate courses open to properly qualified seniors, see the Graduate School bulletin.

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

No.	Title	Credits	Offered to	Prerequisite courses
45	Elem. Educ. Psychology.....	3	Soph., jr., sr.	Psych. 1-2 and 4-5
106-107-108	Adv. Educ. Psychology.....	9	Jr., sr., grad.	55 or equiv.
111	Educational Diagnosis	3	Jr., sr., grad.	55 or equiv.
126-127	Methods in Educ. Research.	4	Jr., sr., grad.	
128	Review of Statistical Studies	2	Jr., sr., grad.	126-127
134-135-136	Mental Tests and Mental Diagnosis	6	Jr., sr., grad.	55 or equiv.
138-139	Experimental Education.....	4	Jr., sr., grad.	55 or equiv.
149-150-151	Psycho-Educational Clinic...	3 to 9	Jr., sr., grad.	Ed. 134-135 or equiv.
153-154-155	Research Problems.....	Ar	Sr., grad.	Consult instructor
156	Psychol. of Vocational Educ.	2	Jr., sr., grad.	55 or equiv.

ROMANCE LANGUAGES

FRENCH

No.	Title	Credits	Offered to	Prerequisite courses
1-2†	Beginning French	10	All	None

† The entire course must be completed before credit is received for any quarter.

No.	Title	Hour	Day	Building	Instructor
108w-109s†	Adv. Gen. Psychol.....	II	MWF	109Psy	
114w-115s†	Human Behavior.....	II	TThS	109Psy	Elliott
119f-120w†	Animal Behavior.....	VI	MWF		
		VII	WF	109Psy	Lashley
121s	Neuropsychology	VI	MWF		
		VII	WF	109Psy	Lashley
125f-126w†	Differential Psychol.....	III	MWF	109Psy	Fernald
127w-128s†	Social Psychol.....	III	TThS	115Psy	
131f-132w†	Child Mind	III	TThS	109Psy	Lowell
144f-145w†	Abnormal Psychol.....	IV	MWF	109Psy	Lashley
156w	Psychol. of Advertising..	IV	MWF	115Psy	Morgan
160f	Employment Psychol.....	IV	MWF	115Psy	Morgan

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Building	Instructor
45f,s	Elem. Educ. Psychology..	I	MWF	Psy	Dealey
45f,w	Elem. Educ. Psychology..	IV	MWF	Psy	Haggerty
106f-107w-108s	Adv. Educ. Psychology...	III	MWF	Psy	Van Wagenen
111s	Educational Diagnosis....	II	MWF	Psy	Van Wagenen
126f-127w	Meth. in Educ. Research.	VIII-IX	T	Psy	Van Wagenen
128s	Review of Statist. Studies	VIII-IX	T	Psy	Van Wagenen
134f-135w-136s	Mental Tests and Mental Diagnosis	VI-VII	TTh	Psy	Haggerty, Dealey
138w-139s	Experimental Education..	Ar	Ar	Psy	Haggerty, Van Wagenen
149f-150w-151s	Psycho-Educ. Clinic.....	Ar	MWF	MH	Dealey, Haggerty
153f-154w-155s	Research Problems.....	Ar	Ar	Psy	Haggerty, Van Wagenen
156s	Psychol. of Vocational Educ.	Ar	Ar	Psy	Haggerty, Dealey

ROMANCE LANGUAGES

FRENCH

No.	Title	Hour	Day	Building	Instructor
(1s)-2f	Beginning French‡	I	TWThFS	202F	Ar
		V	MTWThF	212F	Ar
1f-2w†	Beginning French.....	I	TWThFS	109F	Ar
		II	MWThFS	227F	Ar
		III	MTThFS	226F	Ar
		IV	MTWFS	201F	Ar
		V	MTWThF	226F	Ar
		VI	MTWThF	202F	Ar
1w-2s†	Beginning French	I	TWThFS	202F	Ar
		V	MTWThF	227F	Ar
1s-(2f)†	Beginning French	I	TWThFS	204F	Ar
		V	MTWThF	205F	Ar

† The entire course must be completed before credit is received for any quarter.

‡ Open to students who completed Course 4 in the spring quarter, and to freshmen with one year of high-school French.

No.	Title	Credits	Offered to	Prerequisite courses
3-4	Intermediate French	10	All	1-2, or 2 yrs. high-school French
5-6-7†	Beginning French, Architects	9	Arch.	None
8-9-10	Scientific French	9	Pre-med.	3 or equiv.
[11-12-13†	Education, Journalism, Commerce	9	All	3-4 or 3 yrs. high-school French]
[14-15-16†	Commercial Correspondence..	3	All	3-4 or 3 yrs. high-school French]
20§	Oral and Written French....	5	All	3-4 or 3 yrs. high-school French
21-22-23†	Survey of French Literature.	9	All	3-4 or 3 yrs. high-school French
24-25†	Survey of French Literature	10	All	3-4 or 3 yrs. high-school French
50-51-52†	French Conversation	3	Jr., sr.‡	3-4
53-54-55†	French Composition.....	3	Jr., sr.‡	3-4
56-57-58†	Adv. French Conversation...	3	Jr., sr.‡	20 or 50-51-52
59-60-61†	Adv. French Composition....	3	Jr., sr.‡	20 or 53-54-55
62-63-64†	Practical French Phonetics..	6	Jr., sr.‡	21-22-23 & 20 (or 50-51-52 & 53-54-55) and permission of dept.
80-81-82†	French Lit., 19th Century...	9	Jr., sr.‡	21-22-23
100-101-102†	French Oral Diction.....	6	Jr., sr., grad.	56-57-58
103-104-105†	French Syntax and Comp...	3	Jr., sr., grad.	59-60-61
106	Adv. French Phonetics.....	5	Jr., sr., grad.	56-57-58; 59-60-61, one cent. course and permission of dept.
115-116-117†	French Lit., 17th Century...	9	Jr., sr., grad.	21-22-23
118-119-120†	French Lit., 18th Century...	9	Jr., sr., grad.	21-22-23
121-122-123†	French Lit., 16th Century...	9	Jr., sr., grad.	21-22-23
141-142-143†	Realistic Novel, 19th Century	6	Jr., sr., grad.	80-81-82
150-151-152†	French Dramatic Literature.	6	Jr., sr., grad.	80-81-82 or 115-116-117
[153-154-155†	French Lyric Poetry.....	6	Jr., sr., grad.	80-81-82]
[156-157-158†	French Classicism	6	Jr., sr., grad.	115-116-117]
[159-160-161†	French Criticism.....	6	Jr., sr., grad.	80-81-82]
162-163-164†	French Lit. Craftsmanship..	6	Jr., sr., grad.	80-81-82 and 115-116-117
171-172-173†	Explication de Textes.....	6	Sr., grad.	56-57-58, 59-60-61, & 115-116-117 or 118-119-120
174-175-176†	Lectures in French.....	6	Jr., sr., grad.	50-51-52, 53-54-55; (or 20 and 80-81-82)
[177-178-179†	Adv. Lectures in French....	6	Sr., grad.	56-57-58, 59-60-61, & 115-116-117 or 118-119-120]
191-192-193†	Research Methods and Material	3	Sr., grad.	Consent of instr.

† The entire course must be completed before credit is received for any quarter.

‡ Open without petition to sophomores who have the prerequisites and who satisfy the requirement given on page 18.

§ See departmental requirements, note on freshmen entering with 3 years of high-school French.

[ ] Not offered in 1920-21.

No.	Title	Hour	Day	Building	Instructor
(3s)-4f†	Intermediate French§....	I	TWThFS	227F	Ar
		II	MWThFS	212F	Ar
		III	MTThFS	2F	Ar
		IV	MTWFS	5F	Ar
		V	MTWThF	202F	Ar
3f-4w†	Intermediate French.....	I	TWThFS	5F	Ar
		II	MWThFS	202F	Ar
		III	MTThFS	110F	Ar
		VI	MTWThF	213F	Ar
3w-4s†	Intermediate French.....	I	TWThFS	Ar	Ar
		V	MTWThF	212F	Ar
3s-(4f)†	Intermediate French.....	I	TWThFS	109F	Ar
		II	MWThFS	227F	Ar
		III	MTThFS	226F	Ar
		IV	MTWFS	201F	Ar
		V	MTWThF	226F	Ar
		VI	MTWThF	202F	Ar
5f-6w-7s†	Begin. French (Arch.)...	V	MWF	102F	Ar
8f-9w-10s	Scientific French (Pre-Medics)	I	MWF	212F	Ar
20f	Oral and Written French	III	MTThFS	113F	Frelin
		VI	MTWThF	113F	Ar
20s	Oral and Written French	I	TWThFS	213F	Ar
		II	MWThFS	Ar	Ar
		VI	MTWThF	110F	Ar
21f-22w-23s†	Survey of French Lit....	II	TThS	201F	Van Roosbroeck
		III	TThS	201F	Phelps
		VI	MWF	227F	Searles
24w-25s†	Survey of French Lit....	III	M-F	113F	Ar
		VI	M-F	113F	Ar
50f-51w-52s†	French Conversation.....	II	MW	226F	Ar
		III	MW	201F	Frelin
		V	MW	107F	Frelin
53f-54w-55s†	French Composition.....	II	F	226F	Ar
		III	F	201F	Frelin
		V	F	107F	Frelin
56f-57w-58s†	Adv. French Conversation	II	MW	114F	Barton
		V	MW	109F	Sirich
59f-60w-61s†	Adv. French Composition	II	F	114F	Barton
		V	F	109F	Sirich
62f-63w-64s†	Practical French Phonetics	VII	TTh	227F	Delson
80f-81w-82s†	French Lit.: 19th Century	IV	MWF	202F	Barton
		VI	MWF	125F	Delson
100f-101w-102s†	French Oral Diction.....	V	MW	203F	Ar
103f-104w-105s†	French Syntax and Comp.	V	F	203F	Barton
106s	Adv. French Phonetics...	IV	M-F	212F	Delson
115f-116w-117s†	French Lit.: 17th Century	III	TThS	204F	Searles
118f-119w-120s†	French Lit.: 18th Century	III	MWF	209½F	Olmsted
121f-122w-123s†	French Lit.: 16th Century	VI	MWF	203F	Sirich
141f-142w-143s†	Realistic Novel: 19th Century	VI	TTh	203F	LeCompte
150f-151w-152s†	French Drama	III	TTh	203F	Olmsted
162f-163w-164s†	French Literary Craftsmanship	VI	TTh	227F	Searles
171f-172w-173s†	Explication des Textes...	VII	MW	226F	Ar
174f-175w-176s†	Lectures in French.....	VIII	TTh	201F	Ar
191f-192w-193s†	Research Methods and Material	VIII	M	201F	Van Roosbroeck

† The entire course must be completed before credit is received for any quarter.
§ Open to students who completed Course 7 in the spring quarter.

SPANISH

No.	Title	Credits	Offered to	Prerequisite courses
1-2†	Beginning Spanish.....	10	All	None
3-4	Intermediate Spanish.....	10	All	1-2 or 2 yrs. high-school Spanish
20§	Oral and Written Spanish...	5	All	3-4 or 3 yrs. high-school Spanish
50-51-52†	Spanish Conversation.....	3	Jr., sr.‡	3-4
53-54-55†	Spanish Composition.....	3	Jr., sr.‡	3-4
56-57-58†	Adv. Spanish Conversation..	3	Jr., sr.‡	50-51-52
59-60-61†	Adv. Spanish Composition...	3	Jr., sr.‡	53-54-55
[62-63-64†	Practical Spanish Phonetics.	6	Jr., sr.‡	65-66-67, and 20 (or 50-51-52 and 53-54-55)]
65-66-67†	Survey of Spanish Lit.....	9	Jr., sr.‡	3-4
68-69†	Survey of Spanish Lit.....	10	Jr., sr.‡	3-4
70-71-72†	South Amer. Life and Institutions	6	Jr., sr.‡	20, or 50-51-52 and 53-54-55
73-74-75†	Span. Commer. Correspond..	3	Jr., sr.‡	20, or 53-54-55
80-81-82†	Spanish Lit., 19th Century..	9	Jr., sr.‡	65-66-67
[83-84-85†	South Amer. Literature.....	9	Jr., sr.‡	65-66-67]
100-101-102†	Spanish Oral Diction.....	6	Jr., sr., grad.	56-57-58
103-104-105†	Spanish Syntax.....	3	Jr., sr., grad.	59-60-61
115-116-117†	Spanish Lit., Golden Age....	9	Jr., sr., grad.	65-66-67
[141-142-143†	Spanish Novel.....	6	Jr., sr., grad.	65-66-67
150-151-152†	Spanish Dramatic Lit.....	6	Jr., sr., grad.	65-66-67
[156-157-158†	Selected Classics.....	6	Jr., sr., grad.	65-66-67]
159-160-161†	Cervantes	6	Jr., sr., grad.	65-66-67
174-175-176†	Lectures in Spanish.....	6	Jr., sr., grad.	20 (or 50-51-52 & 53-54-55) & 65-66-67
[177-178-179†	Adv. Lectures in Spanish....	6	Sr., grad.	56-57-58, 59-60-61, and one literary course above Survey]

ITALIAN

No.	Title	Credits	Offered to	Prerequisite courses
1-2†	Beginning Italian	10	Soph., jr., sr.	None
[80	Italian Survey: Renaissance Period	5	Jr., sr.	1-2]
81	Italian Survey: Romantic Period	5	Jr., sr.	1-2
153-154-155†	Italian Lyrics.....	6	Jr., sr., grad.	80 or 81
159-160-161†	Dante, Petrarch, Boccaccio...	6	Jr., sr., grad.	80 or 81
162-163-164†	Dante (in English).....	3	Jr., sr., grad.	Eng. 1-2-3 or Fr. 21-22-23. (Required of students taking 159-160-161)

† The entire course must be completed before credit is received for any quarter.

‡ Open without petition to sophomores who have the prerequisites and who satisfy the requirements given on page 18.

§ See departmental requirements, note on freshmen entering with 3 years of high-school Spanish.

[ ] Not offered in 1920-21.

SPANISH

No.	Title	Hour	Day	Building	Instructor
(1s)-2f	Beginning Spanish‡.....	I	TWThFS	201F	Ar
		VI	MTWThF	201F	Ar
1f-2w†	Beginning Spanish.....	I	TWThFS	226F	Ar
		II	MWThFS	109F	Ar
		III	MTThFS	227F	Ar
		IV	MTWFS	226F	Ar
		V	MTWThF	201F	Ar
		VI	MTWThF	110F	Ar
1w-2s†	Beginning Spanish	I	TWThFS	227F	Ar
		VI	MTWThF	2F	Ar
1s-(2f)†	Beginning Spanish.....	I	TWThFS	2F	Ar
		VI	MTWThF	213F	Ar
(3s)-4f†	Intermediate Spanish§....	I	TWThFS	2F	Ar
		II	MWThFS	205F	Ar
		III	MTThFS	205F	Ar
		IV	MTWFS	101F	Ar
		V	MTWThF	201F	Ar
3f-4w†	Intermediate Spanish.....	II	MWThFS	2F	Ar
		III	MTThFS	202F	Ar
		V	MTWThF	101F	Ar
3w-4s†	Intermediate Spanish.....	I	TWThFS	201F	Ar
		VI	MTWThF	201F	Ar
3s-(4f)†	Intermediate Spanish.....	I	TWThFS	226F	Ar
		II	MWThFS	202F	Ar
		III	MTThFS	227F	Ar
		IV	MTWFS	226F	Ar
		V	MTWThF	202F	Ar
		VI	MTWThF	212F	Ar
20f	Oral and Written Spanish	VI	MTWThF	2F	Drake
20s	Oral and Written Spanish	II	MWThFS	2F	Ar
		III	MTThFS	2F	Ar
		V	MTWThF	101F	Ar
50f-51w-52s†	Spanish Conversation.....	II	MW	201F	Heras
53f-54w-55s†	Spanish Composition.....	II	F	201F	Heras
56f-57w-58s†	Adv. Spanish Convers...	V	MW	104F	Vasconcelos
59f-60w-61s†	Adv. Spanish Comp.....	V	F	104F	Vasconcelos
65f-66w-67s†	Survey of Spanish Lit..	II	TThS	107F	House
68w-69s†	Survey of Spanish Lit..	VI	MTWThF	Ar	Drake
70f-71w-72s†	South American Life and Institutions	VI	MW	226F	Vasconcelos
73f-74w-75s†	Spanish Commercial Correspondence	VI	F	226F	Vasconcelos
80f-81w-82s†	Spanish Lit., 19th Cent..	IV	MWF	227F	Heras
100f-101w-102s†	Spanish Oral Diction....	V	MW	125F	Heras
103f-104w-105s†	Spanish Syntax	V	F	125F	House
115f-116w-117s†	Spanish Lit.: Golden Age.	III	TThS	25F	Henríquez
150f-151w-152s†	Spanish Dramatic Lit....	IV	TS	227F	House
159f-160w-161s†	Cervantes	VI	TTh	226F	Henríquez
174f-175w-176s†	Lectures in Spanish.....	VIII	TTh	202F	Henríquez

ITALIAN

No.	Title	Hour	Day	Building	Instructor
1f-2w†	Beginning Italian.....	I	TWThFS	113F	Phelps
81s	Survey of Italian Lit.: Romantic Period.....	I	MTWThF	113F	Phelps
153f-154w-155s†	Italian Lyrics	II	MW	113F	Phelps
159f-160w-161s†	Dante, Petrarch, Boccaccio	IV	MW	113F	Phelps
162f-163w-164s†	Dante (in English).....	IV	F	113F	Phelps

† The entire course must be completed before credit is received for any quarter.

‡ Open to students who completed Course 31 in the spring quarter, and to freshmen with one year of high-school Spanish.

§ Open to students who completed Course 33 in the spring quarter.

SCANDINAVIAN

No.	Title	Credits	Offered to	Prerequisite courses
1-2	Beginning Norwegian.....	10	All	None
3	Intermediate Norwegian.....	5	All	None
4-5	Adv. Norwegian (Survey)..	10	Soph., jr., sr.	1-2-3
7-8	Beginning Swedish.....	10	All	None
9	Intermediate Swedish.....	5	All	None
10-11	Advanced Swedish.....	10	Soph., jr., sr.	7-8-9
12	Anc. and Med. Scand. Hist.	5	Soph., jr., sr.	10-11, or 4-5 or Hist. 1-2-3
101-102-103	Modern Norweg. Literature.	9	Jr., sr., grad.	4-5
104-105-106	Mod. Scand. History.....	9	Jr., sr., grad.	10-11-12 or 4-5 or 15 cr. in hist.
107-108-109	Mod. Swed. Literature.....	9	Jr., sr., grad.	10-11-12
110	Ibsen	3	Sr., grad.	101-102-103
111-112-113	Old Norse (Icelandic).....	6	Sr., grad.	Consent of instr.
114	Strindberg	3	Sr., grad.	107-108-109
117	Earlier Norweg. Literature..	5	Jr., sr., grad.	4-5
130-131-132	Danish Lit. of 19th Century	9	Jr., sr., grad.	4-5
134-135	The Landsmaal Movement and Literature	6	Sr., grad.	103 or 133
136	Björnson	3	Sr., grad.	103 or 133

SHOP PRACTICE

No.	Title	Credits	Offered to	Prerequisite courses
11-12-13‡	Shop Practice	6	Pre-dent. only	None

SOCIOLOGY AND SOCIAL WORK

No.	Title	Credits	Offered to	Prerequisite courses
1	Introduction to Sociology...	5	3d qu. fr., soph., jr., sr.	None
3	Educational Sociology (Social Aspects of Educ.)....	3	Jr., sr.	1

‡ Carries no credit in this college.

SCANDINAVIAN

No.	Title	Hour	Day	Building	Instructor
1f-2w	Beginning Norwegian....	I	TWThFS	206F	Bothne
3s	Intermediate Norwegian..	I	TWThFS	206F	Bothne
4f-5w	Adv. Norwegian (Survey)	III	MTThFS	206F	Bothne
7f-8w	Beginning Swedish.....	II	MWThFS	206F	Stomberg
9s	Intermediate Swedish....	II	MWThFS	206F	Stomberg
10f-11w	Advanced Swedish.....	I	TWThFS	110F	Stomberg
12s	Ancient and Medieval Scandinavian History..	I	TWThFS	110F	Stomberg
101f-102w-103s	Modern Norwegian Lit...	II	TThS	110F	Bothne
104f-105w-106s	Modern Scand. History..	IV	MWF	206F	Stomberg
107f-108w-109s	Modern Swedish Lit.....	V	MWF	206F	Stomberg
110w	Ibsen	Ar	Ar	206F	Bothne
111f-112w-113s	Old Norse (Icelandic)....	V	TTh	206F	Bothne
114f	Strindberg	Ar	Ar	Ar	Stomberg
117w-118s	Earlier Norwegian Lit....	Ar	Ar	206F	Bothne
131f-132w-133s	Danish Lit., 19th Century	Ar	Ar	206F	Bothne
134f-135w	Landsmaal Movement....	Ar	Ar	206F	Bothne
136s	Björnson	Ar	Ar	206F	Bothne

SHOP PRACTICE

No.	Title	Hour	Day	Building	Instructor
11-12-13	Shop Practice	Ar	Ar	ME	Shipley

SOCIOLOGY AND SOCIAL WORK

No.	Title	Hour	Day	Building	Instructor
1f	Introd. to Sociology.....				
	Section 1	I	TWThFS	9F	Bernard
	2	II	MWThFS	9F	Elmer
	3	V	MTWThF	9F	Wray
	4	VI	MTWThF	9F	Lively
	5	VII	MTWThF	5F	Boettiger
	1f (3 cred.)	IV	MWF	105En(F)	Lundquist
1w	Introd. to Sociology.....				
	Section 1	IV	MTWFS	5F	Finney
	2	V	MTWThF	9F	Wray
	3	VI	MTWThF	9F	Lively
	4	VII	MTWThF	5F	Boettiger
1s	Introd. to Sociology.....				
	Section 1	I	TWThFS	5F	Bernard
	2	II	MWThFS	5F	Lundquist
	3	IV	MTWFS	5F	Finney
	4	V	MTWThF	9F	Wray
	5	VI	MTWThF	9F	Lively
	6	VII	MTWThF	5F	Boettiger
	1f (3 cred.)	IV	MWF	105En(F)	Lundquist
3f	Educational Sociology....				
	Section 1	II	MWF	Ed	Finney
	2	III	MWF	Ed	Finney
3w	Educational Sociology....				
	Section 1	III	MWF	Ed	Finney
3s	Educational Sociology....				
	Section 1	III	MWF	Ed	Finney

No.	Title	Credits	Offered to	Prerequisite courses
6	Modern Social Reform Movements	3	Soph., jr., sr.	1
14	Rural Sociology	3	Soph., jr., sr.	1 for Arts stud.; none for seniors in professional schools
[45-46	Elements of Social Hygiene and Community Protective Work	2	Jr., sr.	1]
51	Background of Dependency and Defectiveness	3	Jr., sr.	10 cr. in soc.; or 10 cr. in soc. & pol. sci., econ., or psych.
52	Treatment of Dependents and Defectives	3	Jr., sr.	51
53	Treatment of Delinquents	3	Jr., sr.	Same as for 51
55	Housing Problems	3	Jr., sr.	Same as for 51
60	Child Welfare	3	Jr., sr.	51 and 52
61	Legal Protection of the Child	3	Jr., sr.	60
97-98-99	Supervised Field Practice Work	3, 6, or 9	Jr., sr.	Consent of director
100	Social Psychology (primarily for sociology students)	3	Jr., sr., grad.	1 and Psych. 1-2-3
101	Social Organization	3	Jr., sr., grad.	Three courses one of which may be in psych., philo., econ., anth., pol. sci., or educ.
102	Social Control	3	Jr., sr., grad.	Same as for 101
[103	Sociology of Conflict	3	Jr., sr., grad.	Same as for 101]
[104	State Care of Dependents, Defectives, and Delinquents in Minnesota	2	Jr., sr., grad.	51, 52 and 53 or 60]
110	Community Organization and Social Work in Small Towns and Country	2	Jr., sr., grad.	Same as for 51
114	Rural Social Institutions	3	Jr., sr., grad.	Same as for 51
119	The Family	3	Jr., sr., grad.	Three courses one of which may be in home econ., econ., pol. sci., anth., or law
120	Social Progress	3	Jr., sr., grad.	Same as for 101
122	Methods of Social Investigation	3	Jr., sr., grad.	Three courses
123	Social Statistics	3	Jr., sr., grad.	122
[125-126-127	Settlement and Community Center Work	4	Sr., grad.	Consent of direc.]
128	Charitable Admin., Finance, and Publicity	2	Jr., sr., grad.	Three courses
130	Technique of Family Treatment	2	Jr., sr., grad.	51, 52
132	Juvenile Courts and Probation	2	Jr., sr., grad.	51, 52, 53
133	Medical Social Service	3	Jr., sr., grad.	51, 52 and one other Senior College course

[ ] Not offered in 1920-21.

No.	Title	Hour	Day	Building	Instructor
6f	Modern Social Reform Movements				
	Section 1	III	MWF	9F	Elmer
	2	V	MWF	5F	Finney
	3	VI	MWF	5F	Boettiger
6w	Modern Social Reform Movements				
	Section 1	III	MWF	9F	Elmer
	2	V	MWF	5F	Lively
	3	VI	MWF	5F	Boettiger
6s	Modern Social Reform Movements				
	Section 1	IV	MWF	9F	Elmer
	2	VI	MWF	5F	Boettiger
14f	Rural Sociology.....	IV	MWF	9F	Lively
14w	Rural Sociology.....	I	TThS	9F	Bernard
		IV	MWF	105En(F)	Lundquist
14s	Rural Sociology.....	III	TThS	9F	Lively
51f	Background of Depend. and Defect.	I	TThS	5F	Bruno
51w	Background of Depend. and Defect.	I	MWF	107F	Bruno
52w	Treatment of Depend. and Defect.	I	TThS	107F	Bruno
52s	Treatment of Depend. and Defect.	I	MWF	9F	Bruno
53w	Treatment of Delinquents	III	TThS	9F	Elmer
53s	Treatment of Delinquents	III	MWF	9F	Elmer
55w	Housing Problems.....	I	MWF	124F	Davis
60w	Child Welfare.....	IV	TS and Ar	9F	Hodson
61s	Legal Protection of Child	VIII	MWF	9F	Hodson
97f-98w-99s	Super. Field Prac. Work.	Ar	Ar	Ar	Mudgett
100f	Social Psychology.....	II	TThS	5F	Bernard
101w	Social Organization.....	II	TThS	9F	Bernard
102s	Social Control.....	II	TThS	9F	Bernard
110w	Community Organ. and Social Work in Small Towns and Country...	VII-VIII	Th	9F	Bernard
114s	Rural Social Institutions..	I	TThS	105En(F)	Lundquist
119f	The Family.....	III	TThS	9F	Elmer
120f	Social Progress.....	II	MWF	5F	Bernard
122w	Methods of Social Investigation	VII	MWF	9F	Elmer
123s	Social Statistics	VII	MWF	9F	Elmer
128s	Charitable Administration, Finance, and Publicity.	VII-VIII	Th	12F	Davis
130s	Technique of Family Treatment	VII-VIII	T	12F	Bruno
132s	Juvenile Courts and Probation	I	TTh	12F	Waite, Bruno
133f	Medical Social Service...	Ar	Ar	Ar	Ar

No.	Title	Credits	Offered to	Prerequisite courses
138-139	Mental Case Work.....	6	Jr., sr., grad.	51, 52 and one other Senior College course
140	History of Social Theory....	3	Jr., sr., grad.	Same as for 101
141	Contemporary Social Theory	3	Jr., sr., grad.	140
[150	Seminar: The Literature of Social Protest.....		Sr., grad.	Consent of direc.]
[151	Seminar: Social Aspects of the Labor Problem.....		Sr., grad.	Consent of direc.]
[152	Seminar: Prob. of Institutional Administration and Reconstruction		Sr., grad.	Consent of direc.]
180-181-182	Seminar in Educational Soc.	6	Jr., sr., grad.	1, 6 and 120 or educ.

[ ] Not offered in 1920-21.

No.	Title	Hour	Day	Building	Instructor
138w	Mental Case Work.....	Ar	Ar	Ar	Ar
139s	Mental Case Work.....	Ar	Ar	Ar	Ar
140w	History of Social Theory.	II	MWF	9F	Bernard
141s	Contemp. Social Theory..	II	MWF	12F	Bernard
180f-181w-182s	Seminar in Educ. Sociol.	VIII-IX	M	Ed	Finney

COURSES IN OTHER COLLEGES

These courses are open to election by seniors, subject to the regulations on page 23.

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

The following divisions of this college offer courses to students in the College of Science, Literature, and the Arts who can meet the prerequisites:

Agricultural Biochemistry
Agricultural Education
Agronomy and Farm Management
Animal Husbandry
Bee Culture
Dairy Husbandry
Entomology and Economic Zoology
Farm Engineering
Forestry
Home Economics
Horticulture
Plant Pathology and Botany
Soils
Veterinary Medicine

Descriptions of the courses will be found in the bulletins of the College of Agriculture, Forestry, and Home Economics. The hour schedule will be found in the program issued each quarter.

Students who desire to take more than a single course in agriculture are advised to consult with some member of the division in which they are interested in order to arrange the sequence of courses which will be of greatest value.

COLLEGE OF EDUCATION
DEPARTMENT OF PHYSICAL EDUCATION FOR WOMEN

		Credits
66	Anatomy and Kinesiology	3
67	Principles of Gymnastic Exercise	3
68	Teachers' Course in Play	3

For description of these courses see bulletin of the College of Education.

LAW SCHOOL

First Quarter	*Second Quarter*	*Third Quarter*
Contracts (3)	‡Contracts (3)	‡Contracts (3)
Carriers (2)	‡Real Property (3)	‡Real Property (3)
Personal Property (3)		

SCHOOL OF MINES

1w	Assaying
2w	Assay Laboratory
3f	General Metallurgy
4w	Metallurgy of Pig Iron
5s	Metallurgy of Wrought Iron and Steel
105f	Metallurgy of the Base Metals
106w	Continuation of Course 105f
107s	Metallurgy of the Precious Metals
153f, 154w, 155s	Metallography

‡ Second- and third-term courses are continuations and open only to students who have completed the work of the first term in such subjects.

The Bulletin *of the* University *of* Minnesota

Announcement of Training Course for Social and Civic Work 1920-1921

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1920

JULY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
..	..	..	..	..	..	..

AUGUST

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..
..	..	..	..	..	..	..

SEPTEMBER

..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	**29**	30	..	..
..	..	..	..	..	..	..

OCTOBER

..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

NOVEMBER

..	1	**2**	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	**25**	26	27
28	29	30	..	..	..	..
..	..	..	..	..	..	..

DECEMBER

..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	**23**	**24**	**25**
26	**27**	**28**	**29**	**30**	**31**	..
..	..	..	..	..	..	..

1921

JANUARY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	..	**1**
2	**3**	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	..	..	..	..	..

FEBRUARY

..	..	1	2	3	4	5
6	7	8	9	10	11	**12**
13	14	15	16	17	18	19
20	21	**22**	23	24	25	26
27	28	..	..	..	..	..
..	..	..	..	..	..	..

MARCH

..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	**25**	**26**
27	**28**	**29**	30	31	..	..
..	..	..	..	..	..	..

APRIL

..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
..	..	..	..	..	..	..

MAY

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	**30**	31	..	..	..	..
..	..	..	..	..	..	..

JUNE

..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	**15**	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	..	..
..	..	..	..	..	..	..

JULY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2
3	**4**	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

AUGUST

..	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	..	..	..
..	..	..	..	..	..	..

SEPTEMBER

..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	**28**	29	30	..
..	..	..	..	..	..	..

OCTOBER

..	..	..	..	..	..	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	..	..	..	..	..

NOVEMBER

..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	..	..	..
..	..	..	..	..	..	..

DECEMBER

..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
..	..	..	..	..	..	..

CALENDAR

1920-1921

1920			
September	18	Saturday	Payment of fees closes, except for new students
September	20-25		Registration period, College of Science, Literature, and the Arts
September	21-28	Week	Examinations for removal of conditions, and entrance examinations
			Registration period, College of Agriculture, Forestry, and Home Economics
September	27-28		Registration days for all colleges not indicated above
September	28	Tuesday	Payment of fees for new students closes
September	29	Wednesday	Fall quarter begins, 8:30 a.m.
October	21	Thursday	Senate meeting, 4:30 p.m.
November	2	Tuesday	Election Day; a holiday
November	25	Thursday	Thanksgiving Day; a holiday
December	16	Thursday	Senate meeting, 4:30 p.m.
December	22	Wednesday	Fall quarter ends, 5:20 p.m.
December	22	Wednesday	Christmas vacation begins, 5:20 p.m.
1921			
January	4	Tuesday	Christmas vacation ends, 8:30 a.m.
January	4	Tuesday	Winter quarter begins, 8:30 a.m.
February	12	Saturday	Lincoln's Birthday; a holiday
February	17	Thursday	Senate meeting, 4:30 p.m.
February	22	Tuesday	Washington's Birthday; a holiday
March	24	Thursday	Winter quarter ends, 5:20 p.m.
March	24	Thursday	Spring vacation begins, 5:20 p.m.
March	30	Wednesday	Spring vacation ends, 8:30 a.m.
March	30	Wednesday	Spring quarter begins, 8:30 a.m.
May	19	Thursday	Senate meeting, 4:30 p.m.
May	30	Monday	Memorial Day; a holiday
June	12	Sunday	Baccalaureate service
June	14	Tuesday	Spring quarter closes, 5:20 p.m.
June	15	Wednesday	Forty-ninth annual commencement
June	17-18		Registration days for summer session
June	20	Monday	Summer session begins
July	30	Saturday	Summer session closes

TRAINING COURSE FOR SOCIAL AND CIVIC WORK

ORGANIZATION

LOTUS D. COFFMAN, President of the University
JOHN B. JOHNSTON, Dean of the College of Science, Literature, and the Arts

ARTHUR J. TODD,[1] Director
FRANK J. BRUNO, Acting Director
LOTUS D. COFFMAN
CEPHAS D. ALLIN
JAMES T. GEROULD
FRANK J. BRUNO
} Executive Committee

FACULTY

WILLIAM ANDERSON, Ph.D., Assistant Professor of Political Science
LUTHER L. BERNARD, Ph.D., Professor of Sociology
ALMA BINZEL, B.S., Assistant Professor of Home Economics
LOUIS A. BOETTIGER, M.A., Instructor in Sociology and Social Work
FRANK J. BRUNO, B.A., B.D., Secretary Minneapolis Associated Charities, Lecturer in Social Work, Acting Director of the Training Course
OTTO W. DAVIS, B.A., Secretary Minneapolis Council of Social Agencies, Lecturer in Social Work
RICHARD M. ELLIOTT, Ph.D., Associate Professor of Psychology
MANUEL C. ELMER, Ph.D., Associate Professor of Sociology
MABEL R. FERNALD, Ph.D., Assistant Professor of Psychology
ROSS L. FINNEY, Ph.D., Assistant Professor of Educational Sociology
HALLY J. FISHER, R.N., Instructor in Home Economics
GUY STANTON FORD, Ph.D., Dean of the Graduate School
ALONZO G. GRACE, M.A., Assistant Instructor in Anthropology
ALVIN H. HANSEN, Ph.D., Associate Professor of Economics
WILLIAM W. HODSON, B.A., LL.D., Director Children's Bureau, State Board of Control, Lecturer in Sociology
ALBERT C. JAMES, B.A., M.B.A., Assistant Professor of Economics
ALBERT E. JENKS, Ph.D., Professor of Anthropology
OSCAR JUNEK, Ph.D., Assistant Professor of Americanization
RUTH M. LINDQUIST, B.S., Instructor in Foods Management
CHARLES E. LIVELY, M.A., Instructor in Sociology and Social Work
ALBERT J. LOBB, Ph.B., LL.B., Assistant Professor of Political Science
GUSTAV A. LUNDQUIST, M.A., Assistant Professor of Rural Sociology
MILDRED D. MUDGETT, B.A., Supervisor of Field Practice Work
MARGARET K. MUMFORD, B.A., Instructor in Nutrition and Home Management
J. ANNA NORRIS, M.D., Professor of Physical Education for Women
ELIZABETH SEEBERG, Ph.D., Lecturer in Mental Case Work

[1] Absent on leave, 1920-21.

ARTHUR J. TODD,[1] Ph.D., Professor of Sociology, Director of the Training Course, Chairman of the Department of Sociology

MARION A. TEBBETS, B.A., Director, Social Service Department, University Hospital and Supervisor of Hospital Social Service

MABEL S. ULRICH, M.D., Lecturer in Social and Civic Work

EDWARD F. WAITE, B.A., LL.M., Judge of the Hennepin County Juvenile Court, Lecturer on Juvenile Courts

NORMAN WILDE, Ph.D., Professor of Philosophy

ANDREW N. WRAY, B.A., Teaching Fellow in Sociology

JEREMIAH S. YOUNG, Ph.D., Professor of Political Science

[1]Absent on leave 1920-21.

GENERAL STATEMENT

Because of the growing complexity of modern social and civic problems and the conviction that only increased training and technical skill can handle them effectively, American universities are pressed to offer specialized professional instruction to meet the new demands. While it may be true that social and civic work is not yet a definite profession in the strict sense that medicine, law, and teaching are professions, it is equally true that the first step toward making it truly professional is to base it upon adequate scientific training. In spite of the bewildering variety of problems which confront social workers, there is still underneath them all a certain stratum of common features for which professional training and professional technic can be communicated. It is the conviction that experience has demonstrated this fact, which prompts the University of Minnesota to offer the following training course for social and civic work. The necessity for maintaining hard-won standards of social work during the war and the enormous work of reconstruction at its close make such a course all the more imperative.

For various reasons this training course has been organized and retained within the College of Science, Literature, and the Arts. Within the regulations of this college, its faculty and administrative officers exercise primary jurisdiction over the content and methods of the training course. It covers both undergraduate and graduate work. The requirements for both entrance and graduation conform to those of the Arts College. Satisfactory completion of the four years' course leads to the degree of Bachelor of Science.

A fifth year's work is designed to lead primarily to a special certificate of proficiency in social and civic work. But students whose programs satisfy requirements of the training course and the Graduate School may receive both the special certificate and the degree of Master of Arts at the close of the fifth year.

The organization of the course of study aims to give the undergraduate the fundamentals of a broad modern education with considerable emphasis upon history, economics, political science, psychology, and language. To this end, all intensive specialization is reserved for the fourth and later years of study.

The fourth year includes comparatively few required courses, but a long list of advised electives, for which other electives may be substituted according to the individual student's needs. While the four years' course as arranged should confer upon the student a certain degree of familiarity with the problems of social and civic work, really adequate professional preparation demands at least one year of graduate study. With this professional instruction in view, during the fifth and later years of study only an irreducible minimum of specified courses is required; the emphasis is laid upon providing individual programs to meet the student's special inclination, aptitudes, or need.

To ensure a first-hand or clinical acquaintance with social problems and technic, a very considerable part of the student's time in his advanced undergraduate and graduate study is devoted to supervised field work with selected social agencies and institutions in and around the Twin Cities. Moreover, every opportunity is taken to bring to the students specialists and experts from the various fields of social work, in order to build up the professional attitude and to establish professional contacts.

This is a distinctly vocational course. Only those students therefore who display evidences of real capacity and the professional spirit will be encouraged to go on with graduate study. This does not mean that qualified students having a special interest in certain courses are debarred; on the contrary they will be welcomed and every effort will be made to meet their specific needs. Nor does it mean that students who do not plan to earn their living by professional social work are to be denied entrance. As a matter of fact, it is to be devoutly hoped that many students will elect the course as a training for effective citizenship and volunteer social work, or as an adjunct to other vocations.

The course, from this standpoint, is of particular concern to the school superintendent and principal, the nurse, the public-health worker, the minister, the factory welfare worker, the labor manager, the librarian, and the Y. M. C. A. leader.

Applicants for admission to the training course must receive the permission of the director. His decision will be based upon the student's apparent fitness to pursue the work, upon his vocational prospects, and upon the facilities for giving the particular training the student seeks.

Tuition fees are the same as for any Arts course, but the student should count on certain expenditures for car fare in doing his field practice work and for traveling expenses in visiting out-of-town institutions.

FACILITIES FOR STUDY, FIELD WORK, AND RESEARCH

The University Library is well provided with current literature in the social sciences, including periodicals and government publications, American and foreign. The Minneapolis Public Library and the library of the State Board of Control supplement these resources. A special seminar room is reserved in the library for advanced work in sociology.

The cities of St. Paul and Minneapolis offer excellent opportunities for supervised field work and research in connection with several types of social agencies: charity organization and family relief, probation, child welfare, compulsory education, housing, hospital social service, recreation, and neighborhood work. The seventeen state institutions under the Board of Control offer an unmatched opportunity to study the various problems of institutional administration. Altogether, Minnesota offers an unusually diversified and attractive range of opportunities for what might be called clinical observation in social work to supplement the more theoretical and academic phase of training.

Ordinarily the student will devote the first half of his required field work to standard case methods in one of the organized relief agencies, the remainder may be done in such other fields as his prospective line of work would lead him to elect. By a special arrangement with the Board of Control, the following institutions each offer a training fellowship of $500 per year to properly qualified students who wish to do their practice work in some phase of institutional administration: Fergus Falls State Hospital for the Insane; Home School for Girls, Sauk Center.

The following outline curriculum will give an idea of the content of the course and of the general sequence of studies. The list of electives may be supplemented by others according to the needs or capacities of the student. Each student's program will be worked out in conference with the director.

Particular attention is called to several courses. The course on Elements of Law is designed especially for social workers. Every student should elect it as it touches the private-law background of every field of social work. The courses on Food Preparation, Dietetics, and Home Management have been designed particularly to meet the needs of visiting housekeepers, visiting teachers, and social case workers in general, especially as they come into contact with differing racial groups. They are also very valuable to the institutional worker. So likewise is the course on Child-Training.

The course on Mental Case Work is designed to meet the widespread demand for at least a minimum of the psychiatric method of approaching case problems. The courses on Americanization Methods, Immigration, and Industrial Relations need no apology in view of post-war problems. Finally, with the problem of educational reconstruction in mind attention is called to the offerings in Educational Sociology and Social Aspects of Education.

COURSE OF STUDY

FIRST AND SECOND-YEAR STUDIES

Required

SOCIOLOGY
- Introduction to Sociology

ECONOMICS
- Principles of Economics

POLITICAL SCIENCE
- American Government

PSYCHOLOGY
- General Psychology
- Additional courses to satisfy the Junior College requirements

Elective

SOCIOLOGY
- Modern Social Reform Movements

ANIMAL BIOLOGY
- General Zoology

ANTHROPOLOGY
- Cultural Anthropology

PHILOSOPHY
- Logic
- Ethics

THIRD-YEAR STUDIES

Required

SOCIOLOGY
- Background of Dependency and Defectiveness
- Treatment of Defectives and Dependents
- Treatment of Delinquents
- Child Welfare
- Housing
- Legal Protection of the Child

ECONOMICS
- Labor Problems and Trade Unionism

POLITICAL SCIENCE
- Municipal Government

Elective

SOCIOLOGY
- Rural Sociology
- Social Control
- Social Organization
- Social Psychology
- [State Care of Dependents, Defectives, and Delinquents]

ANTHROPOLOGY
- Physical Anthropology
- The American Negro

BACTERIOLOGY
- General Bacteriology

ECONOMICS
- The Labor and Socialist Movement in Europe

EDUCATION
- Educational Sociology
- History of Education

PATHOLOGY AND PUBLIC HEALTH (Medical School)
- Preventive Medicine and Hygiene

PHILOSOPHY
- History of Philosophy

POLITICAL SCIENCE
- State and Local Government
- Elementary Law

FOURTH-YEAR AND GRADUATE STUDIES

Required

SOCIOLOGY
- Social Psychology (if not already elected)
- Methods of Social Investigation
- The Family
- Social Progress

Elective

SOCIOLOGY
- Medical Social Service
- Social Statistics
- Mental Case Work
- Charitable Administration, Finance and Publicity

[Courses in brackets not offered in 1920-21.]

Required

Methods of Community Organization and Social Work in Small Towns and Country

(Special note)

For a fifth year's work consisting of 9 hours of class work and 12 hours of supervised field work per week for three quarters the student will receive a special certificate. He will be eligible for the Master's degree if his program is approved by the Graduate School and if he prepares a satisfactory thesis in addition to the work required for the special certificate.

Elective

Supervised Field Practice Work
Technic of Family Treatment
Juvenile Courts and Probation
[Settlement and Community Center Work]
[Elements of Social Hygiene and Community Protective Work]
Rural Social Institutions
History of Social Theory
Contemporary Social Theory
Seminars in Sociology

ANIMAL BIOLOGY
Genetics and Eugenics

ANTHROPOLOGY
Older Immigrants
Newer Immigrants
General Immigration

CIVIL ENGINEERING
Sanitary Engineering

ECONOMICS
Public Finance
Principles of Accounting
Industrial Relations

HOME ECONOMICS
Food Preparation in Relation to Social Work
Elementary Dietetics for the Social Worker
Home Management Problems for the Social Worker
Child-Training

PHYSICAL EDUCATION
Hygiene of the Family
Folk Dancing and Organized Games

POLITICAL SCIENCE
Constitutional Law
Legislative Power and Methods
Police Power

PSYCHOLOGY
Abnormal Psychology
Mental Tests and Mental Diagnosis

PHILOSOPHY
Political and Social Ethics

AGRICULTURAL EDUCATION
History of Agriculture

[Courses in brackets not offered in 1920-21]

COURSE SCHEDULE

No.	Title			Credits	Offered to	Prerequisite courses
1f	Introduction to Sociology...			5	3d qtr. fr., soph., jr., sr.	None
	Sec. 1	I	TWThFS		9F	Bernard
	2	II	MWThFS		9F	Elmer
	3	V	MTWThF		9F	Wray
	4	VI	MTWThF		9F	Lively
	5	VII	MTWThF		5F	Boettiger
	1F	IV	MWF	3	105En(F)	Lundquist
1w	Introduction to Sociology...			5	3d qtr. fr., soph., jr., sr.	None
	Sec. 1	IV	MTWFS		5F	Finney
	2	V	MTWThF		9F	Wray
	3	VI	MTWThF		9F	Lively
	4	VII	MTWThF		5F	Boettiger
1s	Introduction to Sociology...			5	3d qtr. fr., soph., jr., sr.	None
	Sec. 1	I	TWThFS		5F	Bernard
	2	II	MWThFS		5F	Lundquist
	3	IV	MTWFS		5F	Finney
	4	V	MTWThF		9F	Wray
	5	VI	MTWThF		9F	Lively
	6	VII	MTWThF		5F	Boettiger
	1F	IV	MWF	3	105En(F)	Lundquist
3f	Educational Sociology.....			3	Jr., sr.	1
	Sec. 1	II	MWF		Ed	Finney
	2	III	MWF		Ed	Finney
3w	Educational Sociology.....			3	Jr., sr.	1
		III	MWF		Ed	Finney
3s	Educational Sociology.....			3	Jr., sr.	1
		III	MWF		Ed	Finney
6f	Modern Social Reform Movements			3	Soph., jr., sr.	1
	Sec. 1	III	MWF		9F	Elmer
	2	V	MWF		5F	Finney
	3	VI	MWF		5F	Boettiger
6w	Modern Social Reform Movements			3	Soph., jr., sr.	1
	Sec. 1	III	MWF		9F	Elmer
	2	V	MWF		5F	Lively
	3	VI	MWF		5F	Boettiger
6s	Modern Social Reform Movements			3	Soph., jr., sr.	1
	Sec. 1	IV	MWF		9F	Elmer
	2	VI	MWF		5F	Boettiger
14f	Rural Sociology			3	Soph., jr., sr.	1 for Arts students. None for seniors in professional schools.
		IV	MWF		9F	Lively
14w	Rural Sociology			3	Soph., jr., sr.	1 for Arts students. None for seniors in professional schools.
		I	TThS		9F	Bernard
		IV	MWF		105En(F)	Lundquist

No.	Title	Credits	Offered to	Prerequisite courses
14s	Rural Sociology	3	Soph., jr., sr.	1 for Arts students. None for seniors in professional schools.
	III TThS		9F	Lively
51f	Background of Dependency and Defectiveness.....	3	Jr., sr.	10 credits in soc.; or 10 credits in soc. and pol. sci., econ., or psych.
	I TThS		5F	Bruno
51w	Background of Dependency and Defectiveness.....	3	Jr., sr.	10 credits in soc.; or 10 credits in soc. and pol. sci., econ., or psych.
	I MWF		9F	Bruno
52w	Treatment of Dependents and Defectives	3	Jr., sr.	51
	I TThS		5F	Bruno
52s	Treatment of Dependents and Defectives	3	Jr., sr.	51
	I MWF		9F	Bruno
53w	Treatment of Delinquents...	3	Jr., sr.	Same as for 51.
	III TThS		9F	Elmer
53s	Treatment of Delinquents...	3	Jr., sr.	Same as for 51.
	III MWF		9F	Elmer
55w	Housing Problems.....	3	Jr., sr.	Same as for 51.
	I MWF		124F	Davis
60w	Child Welfare.....	3	Jr., sr.	51 and 52
	IV TS and Ar		9F	Hodson
61s	Legal Protection of the Child	3	Jr., sr.	60
	VIII MWF		9F	Hodson
97f-98w-99s	Supervised Field Practice Work	3, 6, or 9	Jr., sr.	Consent of director.
	Ar		Ar	Mudgett
100f	Social Psychology	3	Jr., sr., grad.	1 and psych. 1-2
	II TThS		5F	Bernard
101w	Social Organization	3	Jr., sr., grad.	Three courses one of which may be in psych., phil., econ., anth., pol. sci., or educ.
	II TThS		9F	Bernard
102s	Social Control	3	Jr., sr., grad.	Same as for 101.
	II TThS		9F	Bernard
110w	Community Organization and Social Work in Small Towns and Country	2	Jr., sr., grad.	Same as for 51.
	VII-VIII Th		9F	Bernard
114s	Rural Social Institutions....	3	Jr., sr., grad.	Same as for 51.
	I TThS		105En(F)	Lundquist
119f	The Family.....	3	Jr., sr., grad.	Three courses one of which may be in home econ., econ., pol. sci., anth., or law.
	III TThS		9F	Elmer

No.	Title	Credits	Offered to	Prerequisite courses
120f	Social Progress	3	Jr., sr., grad.	Same as for 101.
	II MWF		5F	Bernard
122w	Methods of Social Investigation	3	Jr., sr., grad.	Three courses.
	VII MWF		9F	Elmer
123s	Social Statistics	3	Jr., sr., grad.	122
	VII MWF		9F	Elmer
128s	Charitable Administration, Finance, and Publicity.....	2	Jr., sr., grad.	Three courses
	VII-VIII Th		12F	Davis
130s	Technic of Family Treatment	2	Jr., sr., grad.	51 and 52
	VII-VIII T		12F	Bruno
132s	Juvenile Courts and Probation	2	Jr., sr., grad.	51, 52, 53
	I TTh		12F	Waite, Bruno
133f	Medical Social Service.....	3	Jr., sr., grad.	51, 52 and one other senior college course.
	Ar		Ar	Ar
138w	Mental Case Work.....	3	Jr., sr., grad.	51, 52 and one other senior college course.
	Ar		Ar	Ar
139s	Mental Case Work.....	3	Jr., sr., grad.	138
	Ar		Ar	Ar
140w	History of Social Theory....	3	Jr., sr., grad.	Same as for 101.
	II MWF		9F	Bernard
141s	Contemporary Social Theory..	3	Jr., sr., grad.	140
	II MWF		12F	Bernard
180f-181w-182s	Seminar in Educational Sociology	6	Jr., sr., grad.	1, 6 and 120 or educ.
	VIII-IX M		Ed	Finney
221f-222w-223s	Graduate Field Training....	None	Grad.	Consent of director
	Ar		Ar	Mudgett

COURSES OF INSTRUCTION

The following list of courses in no way pretends to do more than indicate certain professional and semi-professional subjects which social workers have found it practicable to cover. Descriptive details omitted in this outline will be found in departmental course announcements in the general bulletin of this college.

ELEMENTARY COURSES

1. INTRODUCTION TO SOCIOLOGY. A study of the origin and development of human societies; various agencies which have determined the type of social life; social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. BERNARD, ELMER, FINNEY, LUNDQUIST, BOETTIGER, LIVELY, WRAY.

6. MODERN SOCIAL REFORM MOVEMENTS. A survey of attempts to overcome certain social maladjustments; child labor, the city, bad housing, poverty, degeneracy; movements for public health, industrial democracy, social insurance, protection of infancy and youth, public recreation, etc. ELMER, FINNEY, BOETTIGER, LIVELY.

ECONOMICS

3-4. PRINCIPLES OF ECONOMICS. Principles that underlie the present industrial order. Application of principles to economic problems such as labor, insurance, finance, transportation, industrial combination, government control. HANSEN, JAMES, and others.

POLITICAL SCIENCE

1. AMERICAN GOVERNMENT. Origin and nature of the American governmental system; organization and actual workings of the national government to-day.

PSYCHOLOGY

1-2-3. GENERAL PSYCHOLOGY. An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences. Two lectures, one recitation per week. ELLIOTT and others.

INTERMEDIATE COURSES

14. RURAL SOCIOLOGY. The background and evolution of country life; rural conveniences, communication, coöperation; rural social institutions, especially the family, school, church, and social center; rural leadership, surveys, organization, social agencies. BERNARD, LUNDQUIST, LIVELY.

45-46. ELEMENTS OF SOCIAL HYGIENE AND COMMUNITY PROTECTIVE WORK. (Not offered in 1920-21.)

51. BACKGROUND OF DEPENDENCY AND DEFECTIVENESS. This course considers the conditions in contemporary industrial societies out of which the social problems of the dependent and defective arise. BRUNO.

52. TREATMENT OF DEPENDENTS AND DEFECTIVES. This course reviews the methods used or advocated for the prevention and alleviation of poverty and defectiveness, with special emphasis upon the method of family case work. BRUNO.

53. TREATMENT OF DELINQUENTS. The causes of crime; nature of the criminal; criminal procedure; methods of treatment (prisons, reformatories, parole, probation); the juvenile offender; juvenile courts; preventive methods. ELMER.

55. HOUSING PROBLEMS. An examination of housing evils and their causes; the various movements for the prevention or improvement of bad housing; town- and city-planning; garden cities. Lectures, readings, field work, and essay. DAVIS.

60. CHILD WELFARE. Study of social obligations to the child; development of the child-saving movement in the United States; infant and child mortality, recreation, education; courts, institutions, societies, and other public efforts for the child. HODSON.

61. LEGAL PROTECTION OF THE CHILD. A study of the relation of law to child welfare. A survey of existing children's protective legislation, of its administration and its future development. HODSON.

97-98-99. SUPERVISED FIELD PRACTICE WORK. This is a course in technic open to such students as wish to strengthen their experience in case work. MUDGETT, TEBBETS.

100. SOCIAL PSYCHOLOGY. The social attitudes; their development and modification under social pressures, the interactions of individuals and groups. BERNARD.

101. SOCIAL ORGANIZATION. The organization and structure of social groups; the selection of group types and values; the disorganization and reorganization of institutions; purposive social organization. BERNARD.

102. SOCIAL CONTROL. Nature, purpose, and methods of social control; institutional and non-institutional controls; the evolution of sanctions in social control; the revision of the social controls under the influence of modern science. BERNARD.

ECONOMICS

161. LABOR PROBLEMS AND TRADE UNIONISM. Origin of the labor problem; conditions of labor in American industries; structure, aims, policies, and methods of trade and industrial unionism and employers' associations; collective bargaining and shop committees; mediation and arbitration; injunctions; labor legislation. HANSEN.

EDUCATION

3. EDUCATIONAL SOCIOLOGY. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations. FINNEY.

HOME ECONOMICS

40. CHILD-TRAINING. Application of modern science in rearing, training, and educating children. Emphasis is placed on the physical care of the baby; infant-feeding; infant diseases; early training; obligation of the home; the obligation of the nation. BINZEL, FISHER.

70. FOOD PREPARATION IN RELATION TO SOCIAL WORK. A study of the principles underlying cookery with special emphasis on the preparation of foods to be used in homes with limited income. LINDQUIST.

71. ELEMENTARY DIETETICS FOR THE SOCIAL WORKER. Involves principles underlying adequate feeding. Food habits of different economic and racial groups forming the basis for actual planning and preparation of meals. MUMFORD.

72. HOME MANAGEMENT PROBLEMS FOR THE SOCIAL WORKER. Involves the making of sound budgets. Studies are based upon racial groups and the size of the family together with the income. LINDQUIST.

POLITICAL SCIENCE

11. MUNICIPAL GOVERNMENT. The growth of cities in the United States. The evolution of the council, mayor, commission, and city manager forms of government; their relative merits. Popular control. Municipal functions. Departmental organization and civil service. ANDERSON.

58. ELEMENTARY LAW. Legal principles governing the family and personal relations; judicial decisions regarding social and economic problems; the administration of justice from the standpoint of the citizen. LOBB.

ADVANCED COURSES

110. METHODS OF COMMUNITY ORGANIZATION AND SOCIAL WORK IN SMALL TOWNS AND COUNTRY. Concrete problems and methods are emphasized. BERNARD.

114. RURAL SOCIAL INSTITUTIONS. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. For advanced students. Lectures, discussion, reports. LUNDQUIST.

119. THE FAMILY. The evolution of the family; its various forms and their relation to other social institutions; the service of the family in social evolution; contemporary problems of the family (standards of living, birth-rate, feminism, etc.). ELMER.

120. SOCIAL PROGRESS. A study of the basis for social progress in human nature; analysis of fundamental social institutions with regard to their contributions to human advance; necessary social readjustments to convert drift into progress. BERNARD.

122. METHODS OF SOCIAL INVESTIGATION. Methods of gathering and presenting community facts; social statistics; social surveys. Lectures, problems, and field work. ELMER.

123. SOCIAL STATISTICS. This course is a study and analysis of social statistics and their bearing upon group life. The course is especially designed to give social workers and public-health officials the training necessary to carry on their work successfully. ELMER.

128. CHARITABLE ADMINISTRATION, FINANCE, AND PUBLICITY. A technical study of methods of organizing charitable agencies, of financing them, and of making the public aware of their work. Lectures and practice work. DAVIS.

130. TECHNIC OF FAMILY TREATMENT. An intensive study of social case work as the basis of practical dealing with problems of dependency and defectiveness. Lectures and conferences. BRUNO.

132. JUVENILE COURTS AND PROBATION. Primarily a course in probation practice work, but prefaced by lectures on the social and legal aspects of the juvenile court and probation. BRUNO, WAITE.

133. MEDICAL SOCIAL SERVICE. A course open only to students who are properly grounded in case work and who wish to specialize in this field. ———

138-139. MENTAL CASE WORK. A study of mental abnormality and its treatment through case work. Lectures and clinical instruction. ———, SEEBERG.

140. HISTORY OF SOCIAL THEORY. A rapid survey of the leading social theories from the time of the Greeks, with special reference to the development of sociology in the nineteenth century. The theories are related to their social backgrounds. BERNARD.

141. CONTEMPORARY SOCIAL THEORY. An intensive study of selected types of social theory of the present, open to students who have taken Course 140. BERNARD.

180-181-182. SEMINAR IN EDUCATIONAL SOCIOLOGY. Problems in the social aspects of educational theory and practice. FINNEY.

221-222-223. GRADUATE FIELD TRAINING. Twelve hours per week, each quarter. Open to fifth-year students only. MUDGETT.

253. CRIMINOLOGY. An intensive analysis of recent literature on the nature of the criminal, causes of crime and methods of treatment and prevention. (Not offered in 1920-21.) TODD.

AMERICANIZATION AND ANTHROPOLOGY

5. General Immigration. Facts of recent world migrations. Chief causes of emigration from old nests, and of immigration to the United States; federal and state problems of immigrant legislation, control, and distribution. Junek, Grace.

113. The Older Immigrants. Characteristics, contributions, and distribution of the older immigrant peoples in America; their modification and importance to us. Jenks.

114. The Newer Immigrants. Characteristics, contributions, and distribution of the newer immigrant peoples in America; their modification and importance to us. Jenks.

PHILOSOPHY

124. Political and Social Ethics. The fundamental aspects of society and the state, considered from the point of view of ethics. Wilde.

POLITICAL SCIENCE

157. Police Power. Nature of the police power; constitutional aspects of social and economic legislation, including safety, order, morals, and protection against business fraud and oppression; the fundamental rights under the police power. (Not offered in 1920-21.) Young.

The Bulletin *of the* University *of* Minnesota

The College of Engineering and Architecture

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1920

JULY

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DECEMBER

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5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	**23**	**24**	**25**
26	**27**	**28**	**29**	**30**	**31**	..
..	..	..	..	..	..	..

1921

JANUARY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	..	**1**
2	**3**	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	..	..	..	..	..

FEBRUARY

..	..	1	2	3	4	5
6	7	8	9	10	11	**12**
13	14	15	16	17	18	19
20	**21**	**22**	23	24	25	26
27	28	..	..	..	..	..
..	..	..	..	..	..	..

MARCH

..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	**25**	**26**
27	**28**	**29**	30	31	..	..
..	..	..	..	..	..	..

APRIL

..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
..	..	..	..	..	..	..

MAY

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	**30**	31	..	..	..	..
..	..	..	..	..	..	..

JUNE

..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	**15**	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	..	..
..	..	..	..	..	..	..

JULY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2
3	**4**	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

AUGUST

..	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	..	..	..
..	..	..	..	..	..	..

SEPTEMBER

..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	**28**	29	30	..
..	..	..	..	..	..	..

OCTOBER

..	..	..	..	..	..	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	..	..	..	..	..

NOVEMBER

..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	..	..	..
..	..	..	..	..	..	..

DECEMBER

..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
..	..	..	..	..	..	..

UNIVERSITY CALENDAR

1920-1921

1920			
September	18	Saturday	Payment of fees closes except for new students
September	24-27		Examinations for removal of conditions and entrance examinations; see page 4
September	27	Monday	First semester evening extension classes begin
September	27-28		Registration days
September	28	Tuesday	Payment of fees for new students closes
September	29	Wednesday	Fall quarter begins, 8:30 a.m.
October	21	Thursday	Senate meeting, 4:30 p.m.
November	2	Tuesday	Election Day; a holiday
November	25	Thursday	Thanksgiving Day; a holiday
December	22	Wednesday	Senate meeting, 4:30 p.m.
December	22	Wednesday	Fall quarter ends, 5:20 p.m.
December	22	Wednesday	Christmas vacation begins, 5:20 p.m.
1921			
January	3	Monday	Registration day
January	4	Tuesday	Christmas vacation ends, 8:30 a.m.
January	4	Tuesday	Winter quarter begins, 8:30 a.m.
January	21	Friday	First semester evening extension classes close
January	31	Monday	Second semester evening extension classes begin
February	12	Saturday	Lincoln's Birthday; a holiday
February	17	Thursday	Senate meeting, 4:30 p.m.
February	22	Tuesday	Washington's Birthday; a holiday
March	24	Thursday	Winter quarter ends, 5:20 p.m.
March	24	Thursday	Spring vacation begins, 5:20 p.m.
March	29	Tuesday	Registration day
March	30	Wednesday	Spring vacation ends, 8:30 a.m.
March	30	Wednesday	Spring quarter begins, 8:30 a.m.
May	19	Thursday	Senate meeting, 4:30 p.m.
May	20	Friday	Second semester evening extension classes close
May	30	Monday	Memorial Day; a holiday
June	12	Sunday	Baccalaureate service
June	14	Tuesday	Spring quarter closes, 5:20 p.m.
June	15	Wednesday	Forty-ninth annual commencement
June	17-18		Registration days for summer session
June	20	Monday	Summer session begins
July	30	Saturday	Summer session closes

*Schedule of Condition Examinations**

Friday,	September 24, 9:00 a.m.	Chemistry, Physics
	2:00 p.m.	Mathematics and Mechanics
Saturday,	September 25, 9:00 a.m.	Civil, Electrical, Mechanical Engineering, and Architectural subjects
	2:00 p.m.	Language, Drawing and Descriptive Geometry
Monday,	September 27, 9:00 a.m.	Rhetoric

Condition examinations are ordinarily held in the classrooms of the respective departments. The fee is $1. Students purposing to take such examinations are to notify the department concerned in advance, and make all arrangements with the particular instructor. Where conflicts occur in examination periods, arrangements should be made with the instructors concerned for a new schedule of time.

Condition examinations at times other than those scheduled require faculty authorization as special examinations, and involve a fee of $5.

* Spring quarter subjects only, except for students not in college in the winter and spring quarters of 1919-20.

THE COLLEGE OF ENGINEERING AND ARCHITECTURE

FACULTY

LOTUS DELTA COFFMAN, Ph.D., President
WILLIAM WATTS FOLWELL, LL.D., President Emeritus
CYRUS NORTHROP, LL.D., President Emeritus
ORA MINER LELAND, B.S., C.E., Dean
EDWARD E. NICHOLSON, M.A., Dean of Student Affairs
HENRY T. EDDY, C.E., Ph.D., LL.D., D.Sc., Professor of Mathematics and Mechanics, Emeritus

CEPHAS D. ALLIN, M.A., LL.B., Professor of Political Science
WILLIAM R. APPLEBY, M.A., Professor of Metallurgy
LEON ARNAL, Architecte Diplômé Government France, Professor of Architecture.
FREDERIC H. BASS, B.S., Professor of Municipal and Sanitary Engineering
WILLIAM E. BROOKE, B.C.E., M.A., Professor of Mathematics and Mechanics
SAMUEL C. BURTON, M.A., Assistant Professor of Architecture
ALVIN S. CUTLER, C.E., Associate Professor of Railway Engineering
HANS H. DALAKER, Ph.D., Assistant Professor of Mathematics and Mechanics
GEORGE W. DOWRIE, Ph.D., Professor of Economics
WILLIAM H. EMMONS, Ph.D., Professor of Geology and Mineralogy
HENRY A. ERIKSON, B.E.E., Ph.D., Professor of Physics
JOHN J. FLATHER, Ph.B., M.M.E., Professor of Mechanical Engineering
BEN W. FIELD, Captain, U. S. A., Assistant Professor of Military Science and Tactics
JAMES H. FORSYTHE, M.A. in Arch., Associate Professor of Architecture
ROBERT W. FRENCH, B.S. in C.E., Assistant Professor of Drawing and Descriptive Geometry
ALBERT G. GOODWYN, Captain, U. S. A., Professor of Military Science and Tactics
CARL A. HERRICK, M.E., Assistant Professor of Mathematics and Mechanics
WILLIAM F. HOLMAN, Ph.D., Associate Professor of Mathematics and Mechanics
ROBERT T. JONES, B.S. in Arch., Assistant Professor of Architecture
ROY C. JONES, M.S. in Arch., Assistant Professor of Architectural Design
WILLIAM H. KIRCHNER, B.S., Professor of Drawing and Descriptive Geometry
GEORGE A. MANEY, C.E., M.S., Assistant Professor of Civil Engineering
CHARLES A. MANN, Ph.D., Professor of Chemical Engineering
FREDERICK M. MANN, M.S. in Arch., C.E., Professor of Architecture
JOHN V. MARTENIS, M.E., Associate Professor of Mechanical Engineering

EDWIN R. MARTIN, E.E., Assistant Professor of Electrical Engineering
EDGAR B. MOOMAU, First Lieutenant, U. S. A., Assistant Professor of Military Science and Tactics
[1]BURT L. NEWKIRK, Ph.D., Associate Professor of Mathematics and Mechanics
JOHN I. PARCEL, B.A., B.S. in C.E., Professor of Structural Engineering
GEORGE C. PRIESTER, B.E., M.S., Assistant Professor of Mathematics and Mechanics
FRANK B. ROWLEY, B.S., M.E., Professor of Mechanical Engineering, and Director of the Experimental Engineering Laboratories
WILLIAM T. RYAN, E.E., Associate Professor of Electrical Engineering
GEORGE D. SHEPARDSON, M.A., M.E., D.Sc., Professor of Electrical Engineering
[1]S. CARL SHIPLEY, B.S., M.E., Associate Professor of Machine Construction
CHARLES F. SHOOP, B.S., B.S., in M.E., Associate Professor of Mechanical Engineering
M. CANNON SNEED, Ph.D., Associate Professor of Chemistry
FRANK W. SPRINGER, E.E., Professor of Electrical Engineering
JOHN SUNDWALL, M.D., Professor of Hygiene
HARVEY G. THOMAS, First Lieutenant, U. S. A., Assistant Professor of Military Science and Tactics
JOSEPH M. THOMAS, Ph.D., Professor of Rhetoric
LAURENCE T. WALKER, Captain, U. S. A., Assistant Professor of Military Science and Tactics
LEE R. WATROUS, JR., Captain, U. S. A., Assistant Professor of Military Science and Tactics.
OTTO S. ZELNER, B.S. in C.E., Assistant Professor of Surveying.

CHARLES L. PILLSBURY, Professorial Lecturer in Electrical Engineering

LEON ARCHIBALD, B.Sc., Instructor in Drawing and Descriptive Geometry
JOEL R. BAKER, Master Signal Electrician, Signal Corps U. S. A., Instructor in Military Science and Tactics
CHARLES BOEHNLEIN, B.S., M.E., Instructor in Mathematics and Mechanics
WILLIAM E. BRYANT, Instructor in Foundry
JOHN O. CEDERBERG, JR., Instructor in Drawing and Descriptive Geometry
EDWIN E. CLARK, B.S., Instructor in Mathematics and Mechanics
JOHN J. CRAIG, E.M., Instructor in Mathematics and Mechanics
CHARLES H. DOW, C.E., Instructor in Civil Engineering
OLIVER C. EDWARDS, B.S., M.E., Instructor in Mathematics and Mechanics
HENRY C. T. EGGERS, E.E., Instructor in Drawing and Descriptive Geometry
JOHN E. FINLEY, C.E., Instructor in Drawing and Descriptive Geometry
JOHN G. FRAYNE, B.A., Instructor in Mathematics and Mechanics
RALPH R. GRIFFITH, Instructor in Shop
HENRY E. HARTIG, E.E., Instructor in Drawing and Descriptive Geometry
RAYMOND R. HERRMANN, E.E., Instructor in Mathematics and Mechanics

[1] Absent on leave, 1920-21.

[1]Clark W. Hirleman, B.S. in E., M.E., Instructor in Mechanical Engineering
Cyril M. Jansky, Jr., M.A., Instructor in Electrical Engineering
Carl E. Johnson, Instructor in Architecture
Edgerton W. Kibbey, Instructor in Drawing and Descriptive Geometry
Maurice B. Lagaard, C.E., Instructor in Civil Engineering
Fred C. Lang, C.E., Instructor in Civil Engineering
Carroll E. Lewis, B.S., Instructor in Drawing and Descriptive Geometry
William M. McClintock, M.A., Instructor in Mathematics and Mechanics
Howard D. Myers, B.S. in C.E., Instructor in Drawing and Descriptive Geometry
Arthur R. Nichols, B.S., Lecturer in Architecture
Orrin W. Potter, M.E., Instructor in Drawing and Descriptive Geometry
Edward P. Quigley, Instructor in Forge Work
Paul W. Rhame, Instructor in Mechanical Engineering
William H. Richards, Instructor in Carpentry and Pattern Work
Burton J. Robertson, E.E., Instructor and Assistant Director of the Experimental Engineering Laboratories
Robert F. Schuck, E.E., Instructor in Drawing and Descriptive Geometry
Roderic W. Siler, B.S., Instructor in Mathematics and Mechanics
George W. Swenson, B.S.E., Instructor in Electrical Engineering
Milo E. Todd, B.A., E.E., Instructor in Electrical Engineering
H. B. Wilcox, B.S., M.A., Instructor in Mathematics and Mechanics
William S. Williams, B.S., Instructor in Drawing and Descriptive Geometry

Harry W. Dixon, Engineer, Assistant in Power and Plant Operation
Harry Martinson, Assistant in Mechanical Engineering
Carl Peterson, Assistant in Mechanical Engineering
Fred Teal, Assistant in Mechanical Engineering
John A. Widing, Assistant in Foundry Practice

SPECIAL LECTURERS

P. G. Downton, Electric Storage Battery Company, *Electric Vehicles and Batteries.*
Fred Dustin, Former Electrical Inspector, City of Minneapolis, *Practical Operation of the Rules for Safe Electrical Construction.*

[1] Absent on leave, 1920-21.

GENERAL INFORMATION

The College of Engineering and Mechanic Arts was authorized under the legislative act of 1868, and courses in civil and mechanical engineering were first offered in 1871. A course in electrical engineering was first offered in 1887. In 1912 the name of the college was changed to the College of Engineering and Architecture, and a course in architecture was established.

DEGREES

The College of Engineering and Architecture offers four-year courses of study in Civil, Mechanical, and Electrical Engineering, and Architecture. These courses lead to the degree of Bachelor of Science in Civil, Mechanical, or Electrical Engineering, or in Architecture.

This college also offers work in the Graduate School leading to the degree of Master of Science in Engineering or Architecture.

The degree of Civil, Mechanical, or Electrical Engineer will be conferred upon those who have received the degree of Bachelor of Science in Civil, Mechanical, or Electrical Engineering, after four years of engineering experience in positions of responsibility, and who complete the equivalent of one year's college work either in residence or in absentia, and present a satisfactory thesis.

The candidate for the Engineer's degree who holds a Master's degree in Engineering must have had three years of engineering experience in positions of responsibility and must also present a satisfactory thesis.

For students who entered the College prior to the fall of 1919, four-year courses of study are offered which lead to the degree of Bachelor of Science in Engineering or Architecture. There is also offered for such students a fifth year, upon completion of which the degrees of Civil, Mechanical, and Electrical Engineer, and Architect are conferred.

THE PURPOSES OF THE COLLEGE

The purpose of this college is to give the student a broad foundation in the fundamental principles of engineering together with sufficient knowledge of professional practice to enable him to apply these principles. It is not possible in college to educate a fully trained engineer, as the application of engineering principles to the practice of engineering is to be learned through experience. There are certain subjects, such as surveying and drafting, in which a certain proficiency is acquired. These subjects enable a student upon graduation to fill satisfactorily a subordinate position while obtaining experience.

The character of engineering work has been undergoing many changes, and the engineer is now filling many commercial and executive positions in manufacturing establishments. With these changing demands upon the engineer, the college is emphasizing more and more the commercial training and the commercial application of engineering principles.

Withal, it is intended that the young graduate shall have obtained material assistance in developing those traits of character which will make him a loyal and exemplary citizen and a true gentleman.

The college endeavors to have its technical courses taught by experts in each particular branch who have had considerable practical experience in addition to their technical training.

EXTENSION WORK

Extension courses are offered in architecture and engineering. For definite information regarding extension work attention is directed to the bulletin of the General Extension Division of the University.

ENTRANCE REQUIREMENTS

The entrance requirements of the College of Engineering are given in detail beginning page 10 of this bulletin.

REGISTRATION

For detailed information concerning registration see the printed program of the college. These programs are issued prior to the opening of each quarter. Registration in the fall quarter will occur on September 27 and 28; for the winter quarter on January 3; and for the spring quarter on March 29. Students must register in person (not by mail) on the date set; fees must be paid in advance of this date as no student will be permitted to register until he presents a receipt for fees.

See general information bulletin regarding fines for late registration and late payment of fees.

SPECIAL STUDENTS

In exceptional cases applicants are admitted to the college to pursue, under the direction of the faculty, special lines of study. Such students must be of mature years, and shall give satisfactory evidence of ability to do with credit the work applied for. Admission to the college of students of this class requires in each specific case the approval of the Students' Work Committee and the dean.

ADVANCED STANDING

Students who have pursued courses of study in other colleges of recognized standing may receive advanced credit under the rules of the University and of the college.

CREDIT HOUR

A *credit hour* refers to a unit of time as part of a week's work. One credit hour means three actual hours of work each week. If one credit hour subject is presented in a recitation period, it is assumed that the student will give two hours to the preparation of this hour of classroom work. Where the subject is given in laboratory, shop, or drafting-room, the time spent by the student in class is three actual hours for each credit hour.

A *quarter credit hour* is one credit hour a week extending through a quarter.

FEES AND EXPENSES

The annual fee for students in this college is $90 for residents and $120 for non-residents. See bulletin of general information for details, and for statements of the cost of living.

SCHOLARSHIPS AND PRIZES

For scholarships and prizes in this college, see the bulletin of general information. Special attention is called to the free and service scholarships mentioned in the bulletin of general information.

THESES

Every candidate for a graduate degree such as the degree of Engineer or Architect is required to prepare a thesis on some subject particularly relating to his course. The thesis must embody the result of some research made by him, a special design, or an original report upon some engineering or architectural problem. It must be creditable from a literary, as well as from a technical, point of view.

CHANGES IN BULLETIN

The faculty of the College of Engineering and Architecture reserves the right to cancel or change without notice any course printed in this bulletin. The bulletin is a statement of present conditions, and is subject to modification in any particular by faculty action.

ENTRANCE REQUIREMENTS

1. English ..... 4 units
   or
   English ..... 3 units
   and
   Foreign language ..... 2 units
2. Elementary algebra ..... 1 unit
   Plane geometry ..... 1 unit
3. Enough additional work to make in all 15 units, of which not more than 4 may be in Group F.

High-school students desiring to enter this college are urged to take advanced algebra, solid geometry, and chemistry in high school. Students entering with deficiencies in these subjects will be required to take courses in the University covering these deficiencies before they can proceed with other work for which these are prerequisites. Such courses, however, carry no credit toward graduation.

In order that students who enter with these deficiencies may enter the sophomore year the following fall, it will be necessary for them to attend the summer-school session to complete their freshman work.

Students looking forward to the study of architecture will find it to their advantage to take freehand drawing in high school, to elect French as a language, and to cover the field of general history as far as possible.

LIST OF ENTRANCE SUBJECTS

Only those subjects included in the following groups may be counted toward admission.

The term *unit* means not less than five recitations of forty minutes each per week for a period of thirty-six weeks. In manual subjects and kindred courses, it means the equivalent of ten recitation periods per week for thirty-six weeks.

GROUP A. ENGLISH: 3 or 4 units.

GROUP B. LANGUAGES: Latin, Greek, German, French, Italian, Spanish, Scandinavian, 1 to 4 units each.

GROUP C. HISTORY AND SOCIAL SCIENCES: Ancient and modern history, 1 unit each; English and senior American history, ½ unit each; American government, economics, economic history of England, and economic history of the United States, ½ unit each; commercial geography and history of commerce, ½ unit or 1 unit each.

GROUP D. MATHEMATICS: Elementary algebra and plane geometry, 1 unit each; higher algebra, solid geometry, and trigonometry, ½ unit each.

GROUP E. NATURAL SCIENCES: Physics and chemistry, 1 unit each; botany and zoology, ½ or 1 unit each; physiology, astronomy, geology, and physiography, ½ unit each.

GROUP F. VOCATIONAL SUBJECTS: Business law and business arithmetic, ½ unit each; elementary and advanced bookkeeping, 1 unit each; stenography and typewriting, 1 or 2 units. Freehand drawing, mechanical drawing, and shopwork, 1 or 2 units each. Agriculture, 1 to 4 units. Normal training subjects, 1 to 3 units, provided the applicant has had one year of subsequent teaching experience.

COURSES OF STUDY

CIVIL, MECHANICAL, AND ELECTRICAL ENGINEERING

The freshman year is the same for all engineering courses. The freshman year for courses in Architecture is found on pages 24 and 26.

(For students who enter with credit in higher algebra or solid geometry, or without both.)

FRESHMAN YEAR

(Civil, Electrical, Mechanical)

(For students who enter with credit in higher algebra or solid geometry, or without both.)

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 11	Applied Mathematics and Mechanics	5	5	..	..
Chem. 9*	General Inorganic Chemistry	5	..	3	6
Draw. 1	Engineering Drawing	3	..	..	9
M. E. 11	Shop	2	..	..	6
1	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 12	Applied Mathematics and Mechanics	5	4	..	2
Chem. 10*	General Inorganic Chemistry	5	..	3	6
Draw. 2	Engineering Drawing	3	..	..	9
M. E. 12	Shop	2	..	..	6
	Hygiene and First Aid	0	..	1	..
2	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 13	Applied Mathematics and Mechanics	5	4	..	2
Chem. 14*	Qualitative Chemical Analysis	5	..	3	6
Draw. 3	Engineering Drawing	3	..	..	9
M. E. 13	Shop	2	..	..	6
3	Military Drill	0	..	..	3

* Students who enter without credit in high-school chemistry must register for Chemistry 6, 7, and 8.

FRESHMAN YEAR

(Civil, Electrical, Mechanical)

(For students who enter without either higher algebra or solid geometry, or without both.)

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 9	Higher Algebra	0	3	..	..
M. & M. 10	Solid Geometry	0	3	..	..
Chem. 9*	General Inorganic Chemistry	5	..	3	6
M. E. 11	Shop	2	..	..	6
1	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 11	Applied Mathematics and Mechanics	5	5	..	..
Chem. 10*	General Inorganic Chemistry	5	..	3	6
Draw. 1	Engineering Drawing	3	..	..	9
M. E. 12	Shop	2	..	..	6
	Hygiene and First Aid	0	..	1	..
2	Military Drill	0	..	..	3

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Spring Quarter				
M. & M. 12	Applied Mathematics and Mechanics	5	4	..	2
Chem. 14*	Qualitative Chemical Analysis	5	..	3	6
Draw. 2	Engineering Drawing	3	..	..	9
M. E. 13	Shop	2	..	..	6
3	Military Drill	0	..	..	3

* Students who enter without credit in high-school chemistry must register for Chemistry 6, 7, and 8.

CIVIL ENGINEERING

SOPHOMORE YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 21	Applied Mathematics and Mechanics	5	5	..	..
Phys. 3	Elements of Mechanics and Sound	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Rhet. 4*	Rhetoric and Composition	3	3	..	..
Draw. 21	Drafting	2	..	..	6
C. E. 11	Surveying	3	1	..	8
4	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 22	Applied Mathematics and Mechanics	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Rhet. 5*	Rhetoric and Composition	3	3	...	..
Draw. 22	Drafting	2	..	..	6
C. E. 12	Surveying	3	1	..	8
5	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 23	Applied Mathematics and Mechanics	5	5	..	..
Phys. 43	Magnetism and Electricity	3	1	4	..
Phys. 44	Electrical Laboratory	1	...	..	2
Rhet. 6*	Rhetoric and Composition	3	3	..	..
Draw. 23	Drafting	2	..	..	6
C. E. 13	Surveying	3	1	..	8
6	Military Drill	0	..	..	3

* For 1920-21 substitute an elective.

JUNIOR YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 131	Technical Mechanics	3	3	..	..
M. & M. 134	Strength of Materials	2	2	..	..
M. & M. 141	Materials-Testing Laboratory	1	..	..	3
C. E. 31	Stresses in Structures	3	..	..	6
C. E. 14	Surveying	3	1	..	8
C. E. 51	Highways and Pavements	3	2	..	3
	Electives:	3	..	..	..
	General Economics, Econ. 8				
	American Government, P. S. 25				
	Geology				
	Metallurgy				

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Winter Quarter				
M. & M. 132	Technical Mechanics	3	3	..	..
M. & M. 135	Strength of Materials	3	3	..	..
C. E. 32	Stresses in Structures	3	1	..	6
C. E. 21	Railway Engineering	3	1	..	6
C. E. 51	Highways and Pavements	3	1	..	3
	Elective:	3	..	..	..
	General Economics, Econ. 9				
	American Government, P. S. 26				
	Geology				
	Metallography 156				
	Spring Quarter				
M. & M. 133	Technical Mechanics	2	2	..	..
M. & M. 136	Hydraulics	3	3	..	..
M. & M. 143	Hydraulics Laboratory	1	..	..	3
C. E. 33	Elementary Structural Design	3	1	..	6
C. E. 22	Railway Engineering	3	1	..	6
C. E. 53	Municipal Engineering	3	1	2	..
	Elective:	3	..	..	..
	General Economics, Econ. 10				
	Business Law, P. S. 27				
	Geology				
	Advanced Metallography, 157				
	Summer Camp				
C. E. 23	Summer camp is held in the vacation preceding the senior year for 6 weeks from August 15 to October 1. Credit: 9 hours to be applied to electives in senior year. Required of all students taking the Civil Engineering course.				

SENIOR YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
C. E. 161	Hydrology	4	2	..	6
C. E. 131	Bridge Analysis	4	1	..	6
C. E. 141	Reinforced Concrete	3	1	1	3
	Option:	3	..	..	..
	1. Railway Engineering, C. E. 121				
	2. Geology				
	Elective:				
	American Government, P. S. 25				
	General Economics for Engineers, Econ. 8				
	Principles of Organization & Management, Econ. 23				
	Metallurgy				
	Winter Quarter				
C. E. 142	Reinforced Concrete	3	1	..	6
M. E. 149	Heat Engines	4	3	..	4
	Options:	7	..	..	..
	1. { Water Supply, C. E. 162 Water Power, C. E. 164				
	2. { Bridge Design, C. E. 132 Mechanical Engineering				
	3. { Railway Engineering, C. E. 122 Transportation, C. E. 124				
	4. Geology				

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Electives:	3	..	..	..
	General Economics for Engineers, Econ. 9				
	Business Finance, Econ. 57				
	American Government, P. S. 26				
	Metallography 156				

Spring Quarter

E. E. 42	Electric Power	4	3	..	3
	Options:	7–10	..	..	..
	1. Sanitary Engineering, C. E. 163				
	Water Power, C. E. 163				
	Hydraulic Laboratory, C. E. 263				
	2. Foundations, C. E. 143				
	Bridge Design, C. E. 133				
	3. Railway Engineering, C. E. 123				
	Transportation, C. E. 125				
	4. Geology				
	Electives:	3–6	..	..	..
	General Economics for Engineers, Econ. 10				
	Principles of Accounting, Econ. 27				
	Business Law, P. S. 27				
	Advanced Metallography 157				
	Technical Elective				

POST-SENIOR OPTIONS IN CIVIL ENGINEERING

POST-SENIOR YEAR*

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
C. E.	Thesis	6–15	..	..	..
	Option	3– 6	..	..	..
	Elective	0– 6	..	..	..
	Winter Quarter				
C. E.	Thesis	6–15	..	..	..
	Option	3– 6	..	..	..
	Elective	0– 6	..	..	..
	Spring Quarter				
C. E.	Thesis	6–15	..	..	..
	Option	3– 6	..	..	..
	Elective	0– 6	..	..	..

Group Options

1. Hydraulic and Municipal Engineering:
   - Water Supply, Problems, C. E. 262
   - Water Power, C. E. 264
   - Building Sanitation, C. E. 271
   - Water and Sewage Purification, C. E. 261
   - Hydraulic Laboratory, C. E. 263
   - Highway Laboratory, C. E. 251
   - City-Planning, C. E. 272
   - Drainage and Flood Control, C. E. 265
   - River Improvement, C. E. 266

2. Structural Engineering:
   Indeterminate Structures, C. E. 231, 232, 233
   Advanced Structural Design, C. E. 234, 235, 236
   Cement and Concrete Laboratory, C. E. 243, 244
   Structural Laboratory, C. E. 237, 238
   Reinforced Concrete Analysis, C. E. 245, 246, 247
3. Railway Engineering:
   Railway Administration, C. E. 221, 222, 223
   Railway Terminals and Yards, C. E. 224
   City-Planning, C. E. 272

Electives to be selected from

1. Senior electives
2. Economics
3. Political Science
4. Sociology
5. Psychology
6. Mechanical Engineering
7. Electrical Engineering
8. Chemistry
9. Physics

NOTE: *Post-senior students will select their group options and thesis subjects in allied lines. These choices shall be subject to the approval of the department. Group options and electives may be selected from the above lists.

MECHANICAL ENGINEERING

SOPHOMORE YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 21	Applied Mathematics and Mechanics	5	5	..	..
Phys. 3	Elements of Mechanics and Sound	3	1	3	..
Phys. 4	Mechanics Laboratory	1	..	..	2
Rhet. 4*	Rhetoric and Composition	3	3	..	..
Draw. 27	Drafting	2	..	..	6
M. E. 14	Shop	4	..	..	12
	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 22	Applied Mathematics and Mechanics	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Rhet. 5*	Rhetoric and Composition	3	3	..	..
Draw. 28	Drafting	2	..	..	6
M. E. 15	Shop	4	..	..	12
	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 23	Applied Mathematics and Mechanics	5	5	..	..
Phys. 43	Magnetism and Electricity	4	1	4	..
Phys. 44	Electrical Laboratory	1	..	..	2
Rhet. 6*	Rhetoric and Composition	3	3	..	..
M. E. 41	Automotives	2	2	..	..
M. E. 21	Mechanical Technology	1	..	1	..
M. E. 31	Elementary Machine Design	2	0	..	6
	Military Drill	0	..	..	3

* For 1920-21 substitute junior option.

It is recommended that each student in the Mechanical Engineering Department spend at least one summer vacation in machine-shop practice.

JUNIOR YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 131	Technical Mechanics	3	3	..	..
M. & M. 134	Strength of Materials	2	2	..	..
M. & M. 141	Materials-Testing Laboratory	1	..	..	3
M. E. 42	Steam Engines	3	3	..	..
M. E. 81	Elementary M. E. Laboratory	2	..	..	6
M. E. 32	Mechanism	4	4	..	..
	Electives:	3	..	..	..
	Economics,* Econ. 8				
	American Government, P. S. 25				
	or Options:	3	..	..	..
	Quantitative Analysis, Chem. 20				
	Metallurgy				
	Seminar, M. E. 90 (optional)				
	Winter Quarter				
M. & M. 132	Technical Mechanics	3	3	..	..
M. & M. 135	Strength of Materials	3	3	..	..
M. E. 43	Steam Engines and Boilers	3	3	..	..
M. E. 82	Elementary M. E. Laboratory	2	..	..	6
M. E. 34	Kinematics and Machine Design	4	2	1	6
	Electives:	3	..	..	..
	Economics,* Econ. 9				
	American Government, P. S. 26				
	Options:	3	..	..	..
	Quantitative Analysis, Chem. 20				
	Metallography 156				
	Seminar, M. E. 91 (optional)				
	Spring Quarter				
M. & M. 133	Technical Mechanics	2	2	..	..
M. & M. 136	Hydraulics	3	3	..	..
M. & M. 143	Hydraulics Laboratory	1	..	..	3
M. E. 61	Measurement of Power	2	2	..	2
M. E. 83	Elementary Power Laboratory	2	..	..	6
M. E. 35	Machine Design	3	..	2	6
E. E. 43	Electric Power	3	2	..	3
	Electives:	3–4	..	..	..
	Technical Writing, Rhet. 31				
	Business Law, P. S. 27				
	Principles of Accounting, Econ. 57				
	or Options:	3	..	..	..
	Metallography 157				
	Power-Plant Chemistry, Chem. 60				
	Seminar, M. E. 92 (optional)				

* Required junior or senior year. Two quarters only.

SENIOR YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. E. 151	Thermodynamics	3	2	..	..
E. E. 44	Electric Power	3	..	..	8
M. E. 231	Engineering Design as approved	3	..	..	8
M. E. 182	Advanced Steam Laboratory	2	..	..	6
M. E. 190	Seminar	1	..	1	1

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Electives:	0–3	..	..	..
	Any junior elective				
	Cost accounting, Econ. 131				
	Principles of Organization and Management, Econ. 23				
	Options:	6–3	..	..	..
	Any junior option				
	Structural Engineering, C. E. 35				
	Reinforced Concrete, C. E. 144				
	Winter Quarter				
E. E. 45	Electric Power	3	2	..	3
M. E. 150	Gas Engines and Producers	3	2	..	..
M. E. 183	Power- and Gas-Engine Laboratory	2	..	..	6
M. E. 232	Engineering Design as approved	3	..	..	8
M. E. 191	Seminar	1	..	1	1
	Electives:	0–3	..	..	..
	Any junior elective				
	State and Municipal Government				
	Business Finance, Econ. 57				
	Industrial Relations, Econ. 167				
	Industrial Accounting, Econ. 132				
	Options:	6–3	..	..	..
	Any junior option				
	Steam Turbines and Laboratory	..	2	..	3
	Structural Engineering Design	..	1	..	6
	Spring Quarter				
M. E. 233	Engineering Design as approved	3	..	..	8
M. E. 184	Advanced Engineering Laboratory	2	..	..	6
M. E. 193	Engineering Practice	2	..	2	..
M. E. 192	Seminar	1	..	1	1
	Electives:	0–3	..	..	..
	Any junior elective				
	Industrial Accounting, Econ. 133				
	Public Utilities, Econ. 154				
	Options:	6–10	..	..	..
	Any junior option				
	Power-Plant Management	..	1	..	6
	Heating and Ventilating, M. E. 153	..	2	1	3
	Compressed air & Refrigerating Machinery, M. E. 256				
	Surveying, C. E. 16				

If a student does not take an elective in junior year he may take a total of 18 credits from the elective series in senior year.

POST-SENIOR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. E. 223	Industrial Management	3	2	1	..
M. E. 287	Engineering Research including thesis	9–3	..	..	..
	Group options	6–9	..	..	..
	Electives	6–3	..	..	..
	Winter Quarter				
M. E. 295	Contracts and Specifications	3	1	2	..
M. E. 288	Engineering Research including thesis	9–3	..	..	..
	Group options	6–9	..	..	..
	Electives	6–3	..	..	..

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Spring Quarter				
M. E. 289	Engineering Research including thesis	9-3	..	..	..
	Group options	6-9	..	..	..
	Electives	6-3	..	..	..
	Total credits from 18 to 20 each quarter.				

SUGGESTED POST-SENIOR OPTIONS AND ELECTIVES IN RAILWAY MECHANICAL ENGINEERING

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. E. 271	Railway Technology	1	..	..	2
M. E. 272	Railway Design and Locomotive Construction	4	1	1	8
E. E. 144	Railway Electrical Engineering	2	..	..	..
	Winter Quarter				
M. E. 273	Railway Design and Locomotive Construction	4	1	1	8
E. E. 145	Railway Electrification	3	..	..	..
	Spring Quarter				
M. E. 274	Railway Design and Locomotive Construction	4	1	1	8
M. E. 278	Locomotive Road Tests	3	..	..	8
M. E. 237	Gas-Tractor Design	3	..	..	8

SUGGESTED POST-SENIOR OPTIONS AND ELECTIVES IN POWER ENGINEERING

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. E. 235	Steam-Engine Design	3	..	..	8
M. E. 255	Advanced Heating and Ventilating	3	3	..	..
E. E. 141	Central Stations	2	..	..	..
Chem. 20	Quantitative Analysis	3	..	..	-
M. E. 262	Power Engineering	3	1	..	6
	Winter Quarter				
M. E. 236	Gas-Engine Design	3	..	..	8
M. E. 152	Steam Turbines	3	2	..	3
M. E. 266	Power-Plant Design	3	..	..	8
M. E. 263	Power-Plant Management	3	1	..	6
C. E. 164	Water Power	3	..	..	..
	Spring Quarter				
M. E. 237	Gas-Tractor Design	3	..	..	8
Chem. 60	Power-Plant Chemistry	3	..	1	6
M. E. 267	Power-Plant Design	3	..	..	8
M. E. 264	Power-Plant Management	..	..	..	..

SUGGESTED POST-SENIOR OPTIONS AND ELECTIVES IN INDUSTRIAL MANAGEMENT

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. E. 210	Tool Design	3	..	..	8
C. E. 273	Industrial Sanitation	2	..	..	..
M. E. 255	Advanced Heating and Ventilating	3	3	..	..

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Winter Quarter				
M. E. 223	Industrial Management	3	1	..	6
M. E. 263	Power-Plant Management	3	..	1	6
M. E. 226	Safety Engineering	2	..	2	..
	Spring Quarter				
M. E.	Industrial Management	3	1	..	6
M. E. 264	Power-Plant Management	3	..	1	6
M. E.	Heating and Ventilating	4	2	1	3

ELECTIVES

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
Econ. 8	General Economics for Engineers	3	3	..	..
P. S. 25	American Government	3	..	..	..
Econ. 131	Cost Accounting	3	..	..	..
Econ. 23	Principles of Organization and Management	3	..	..	..
Econ. 166	Employment Management	3	..	..	..
Rhet. 31	Technical Writing and Reports	3	..	..	..
M. E. 290	Advanced Seminar	1	..	1	1
	Any approved elective	3–6	..	..	..
	Winter Quarter				
Econ. 9	Economics for Engineers	3	3	..	..
P. S. 26	American Government	3	..	..	..
Econ. 132	Industrial Accounting	3	..	..	..
Econ. 167	Industrial Relations	3	..	..	..
Econ. 57	Business Finance	3	..	..	..
	Any approved elective	3–6	..	..	..
M. E. 291	Advanced Seminar	1	..	1	1
	Spring Quarter				
P. S. 27	Business Law	3	..	..	..
Econ. 27	Accounting	4	..	..	..
Econ. 133	Industrial Accounting	3	..	..	..
Econ. 154	Public Utilities	3	..	..	..
	Any approved elective	3–6	..	..	..
M. E. 292	Advanced Seminar	1	..	1	1

At the beginning of the post-senior year the student should select those studies, in an approved logical order of sequence, which will best prepare him for the chosen line of work which he desires to enter. This year is intended to afford opportunity for specializing in some particular line of engineering work, but the student is not limited to any particular field and he may find it to his advantage to take certain electives in other departments. While the preceding options and electives afford opportunity for specialization in the various fields indicated, it is not intended to confine a student to any one of the courses outlined.

ELECTRICAL ENGINEERING

For freshman year see page 12.

SOPHOMORE YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 21	Applied Mathematics and Mechanics	5	5	..	..
Phys. 3	Elements of Mechanics and Sound	3	1	3	..
Phys. 4	Mechanics Laboratory	1	..	..	2
Rhet. 4*	Rhetoric and Composition	3	3	..	..
Draw. 27	Drafting	2	..	..	6
E. E. 11	Elements of Electrical Engineering	3	2	2	..
	Military Drill	0	..	..	3

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Winter Quarter				
M. & M. 22	Applied Mathematics and Mechanics	5	5	..	..
Phys. 23	Heat	3	1	3	..
Phys. 24	Heat Laboratory	1	..	..	2
Rhet. 5*	Rhetoric and Composition	3	3	..	..
Draw. 28	Drafting	2	..	..	6
E. E. 13	Elements of Electrical Engineering	3	2	..	2
	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 23	Applied Mathematics and Mechanics	5	5	..	..
Phys. 43	Magnetism and Electricity	4	1	5	..
Phys. 44	Electrical Laboratory	1	..	..	2
Rhet. 6*	Rhetoric and Composition	3	3	..	..
M. E. 16	Shop	2	..	..	6
E. E. 15	Elements of Electrical Engineering	3	2	..	2
	Military Drill	0	..	..	3

* For 1920-21 substitute an elective.

JUNIOR YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 131	Technical Mechanics	3	3	..	..
M. & M. 134	Strength of Materials	2	2	..	..
M. & M. 141	Materials-Testing Laboratory	1	..	..	3
E. E. 111	Direct Current Machinery	3	3	..	..
E. E. 112	Direct Current Machinery Laboratory	2	..	..	4
Phys. 144	Electrical Measurements	3	1	..	6
Econ. 8	General Economics for Engineers	3	3	..	..
	Elective	0–4	..	..	..
	Winter Quarter				
M. & M. 132	Technical Mechanics	3	3	..	..
M. & M. 135	Strength of Materials	3	3	..	..
E. E. 113	Direct Current Machinery	3	3	..	..
E. E. 114	Direct Current Machinery Laboratory	2	..	..	4
M. E. 33	Mechanism and Kinematics	3	2	..	3
Econ. 9	General Economics for Engineers*	3	3	..	..
	Electives	0–3	..	..	..
	Spring Quarter				
M. & M. 133	Technical Mechanics	2	2	..	..
M. & M. 136	Hydraulics	3	3	..	..
M. & M. 143	Hydraulics Laboratory	1	..	..	3
E. E. 115	Direct Current Machinery	3	3	..	..
E. E. 116	Direct Current Machinery Laboratory	2	..	..	4
M. E. 37	Machine Design	3–4	..	..	..
Econ. 10	General Economics for Engineers*	3	3	..	..
	Elective	0–3	..	..	..

SENIOR YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
E. E. 121	Alternating Currents	3	3	..	..
E. E. 122	Alternating Currents Laboratory	2	..	..	4
E. E. 132	Electrical Design*	2	2	..	4
M. E. 144	Heat Engines*	3	2	..	3
	Electives	6–9	..	..	..

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Winter Quarter				
E. E. 123	Alternating Currents	3	3	..	..
E. E. 124	Alternating Currents Laboratory	2	..	..	4
E. E. 134	Electrical Design*	2	2	..	4
M. E. 145	Heat Engines*	3	2	..	3
	Electives	6–9	..	..	..
	Spring Quarter				
E. E. 125	Alternating Currents	3	3	..	..
E. E. 126	Alternating Currents Laboratory	2	..	..	4
E. E. 136	Electrical Design*	2	2	..	4
M. E. 146	Heat Engines*	3	2	..	3
	Electives	6–9	..	..	..

* Students intending to specialize in chemistry or physics will postpone Economic Problems until their senior year, displacing Heat Engines. They may also displace Electrical Design.

POST-SENIOR YEAR

Course no.	Title	Credits
	Thesis and related major	6 to 12 credits per quarter
	Minor electives	4 to 10 credits per quarter
	Total	16 to 18 credits per quarter

ELECTIVES

Suggested for sophomores:
- German 4, 5, 6
- German 7, 25, 26
- American Government P. S. 25, 26
- Business Law P. S. 27
- Geology
- Machine Shop
- Automotives
- Qualitative Analysis (Chem. 14)
- Quantitative Analysis (Chem. 20)

Suggested for juniors:
- Sophomore electives, or
- Signal Corps R. O. T. C. Mil. Sci.
- Electrical Communication E. E. 37, 38, 39
- Structures
- Concrete
- Surveying

Suggested for seniors:
- Sophomore or junior electives, or
- Central Stations
- Electrical Transmission
- Lighting
- Electrical Railway Engineering
- Railway Electrification
- Batteries and Electrical Vehicles
- Electrical Seminar
- Power-Plant Operation
- Signal Corps R. O. T. C.
- Radio Communication
- Telegraph and Telephone
- Physical Chemistry
- Theoretical Physics, Phys. 181-183-185
- Metallurgy
- Metallography

ELECTIVES *(Continued)*

Accounting
Business Organization
Business Finance
Suggested for post-seniors:
Senior electives, or
Advanced Alternating-Current Measurements
Advanced Electrical Laboratory
Differential Equations
Transient Electrical Phenomena 151-152-153
Thermodynamics
Steam Turbines
Heating and Ventilation
Comp. Air and Refrigeration
Hydrology
Water Power
Math. Theory of Electricity and Magnetism, Phys. 241-243-245
Electron Theory, Phys. 247-248-249
Vacuum Tubes
Electrometallurgy
Electrochemistry, Chem. 175, 176
Precise Electrical Measurements
High-Tension and High-Frequency Testing
Electrical Ignition
Transmission Line Design
Illumination Engineering
Advanced Electrical Design
Contracts and Specifications
Business Relations
Valuation
Industrial Management
Power-Plant Design
Corporation Finance, Econ. 54
Modern Business Corporation, Econ. 153
Public Utilities, Econ. 154
Labor Problems
Trade Unionism
Industrial Relations, Econ. 167
Law of Labor, P. S. 175

GENERAL COURSE IN ENGINEERING

The faculty of the College of Engineering and Architecture has voted to discontinue the course in General Engineering. At the time of this decision it was voted that those students who will become seniors in the year 1920-21 will be permitted to arrange a definite program for the remainder of their course, and at the completion of this program will be granted the degree of Bachelor of Science in Engineering as heretofore. Other classes in the College of Engineering and Architecture have been requested to transfer to one or the other of the regular departments of engineering with such adjustments in their programs as will be needed to place them in the particular department which they choose.

ARCHITECTURE

GENERAL COURSE

FRESHMAN YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 11	Applied Mathematics and Mechanics	5	5	..	..
Draw. 31	Graphics	2	..	2	..
Rhet. 4	Rhetoric and Composition	3	3	..	..
Arch. 31	Elements of Architecture	4	..	2	10
Arch. 21	Freehand Drawing	2	..	..	6
	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 12	Applied Mathematics and Mechanics	5	4	..	2
Draw. 32	Graphics	2	..	2	..
Rhet. 5	Rhetoric and Composition	3	3	..	..
Arch. 32	Elements of Architecture	4	..	1	8
Arch. 22	Freehand Drawing	2	..	..	6
	Hygiene and First Aid	0	..	1	..
	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 13	Applied Mathematics and Mechanics	5	4	..	2
Draw. 33	Graphics	2	..	2	..
Rhet. 6	Rhetoric and Composition	3	3	..	..
Arch. 33	Elements of Architecture	4	..	1	8
Arch. 23	Freehand Drawing	2	..	..	6
	Military Drill	0	..	..	3

SOPHOMORE YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 91	Calculus for Architects	4	4	..	..
Phys. 3	Elements of Mechanics and Sound	3	1	3	..
Arch. 24	Freehand Drawing	2	..	..	4
Arch. 34	Design	4	..	..	12
Arch. 14	History of Architecture	2	..	2	..
Arch. 44	Elements of Construction	2	..	1	5
	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 92	Mechanics for Architects	4	4	..	..
Phys. 23	Heat	3	1	3	..
Arch. 25	Freehand Drawing	2	..	..	6
Arch. 35	Design	4	..	..	12
Arch. 15	History of Architecture	2	..	2	..
Arch. 45	Elements of Construction	2	..	1	5
	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 93	Strength of Materials for Architects	4	4	..	..
Phys. 43	Magnetism and Electricity	4	1	4	..
Arch. 26	Freehand Drawing	2	..	..	6
Arch. 36	Design	4	..	..	12
Arch. 16	History of Architecture	2	..	2	..
Arch. 46	Elements of Construction	2	..	1	5
	Military Drill	0	..	..	3

JUNIOR YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
Arch. 18	History of Architecture	2	..	2	..
Arch. 27	Freehand Drawing	2	..	..	2
Arch. 37	Design	7	..	..	21
C. E. 38	Stresses	3	..	1	5
Econ. 8	General Economics	3	3	..	..
	Winter Quarter				
Arch. 18	History of Architecture	2	..	2	..
Arch. 28	Freehand Drawing	2	..	..	6
Arch. 38	Design	7	..	..	21
C. E. 39	Structural Design	3	..	1	5
Econ. 9	General Economics	3	3	..	..
	Spring Quarter				
Arch. 19	History of Architecture	2	..	2	..
Arch. 29	Freehand Drawing	2	..	..	2
Arch. 39	Design	7	..	..	21
C. E. 41	Reinforced Concrete	3	..	1	5
Econ. 10	General Economics	3	3	..	..

SENIOR YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
Arch. 131	Design	10	..	..	30
Arch. 151	Architectural Seminar	1	..	1	..
Arch. 141	Materials of Construction	2	..	2	..
Arch. 161	History of Sculpture and Painting	2	..	2	..
E. E. 40	Electric Wiring and Equipment	2	..	2	..
	Winter Quarter				
Arch. 132	Design	10	..	..	30
Arch. 152	Architectural Seminar	1	..	1	..
Arch. 142	Materials of Construction	2	..	2	..
Arch. 162	Landscape Design	2	..	1	5
C. E. 171	Building Sanitation	2	2	..	..
	Spring Quarter				
Arch. 133	Design	10	..	..	30
C. E. 17	Surveying	1	..	1	..
Arch. 153	Business Relations	2	..	2	..
Arch. 163	Allied Arts	2	..	2	..
M. E. 154	Heating and Ventilating	2	2	1	3

NOTE: Students entering with deficiency in entrance mathematics will not be allowed to register in Elements of Architecture (4) until the second quarter. Such students must enter the summer quarter to complete the resulting deficiencies in freshman required work. Otherwise they may not enter the sophomore year.

Students entering deficient in entrance chemistry must register in chemistry in place of rhetoric.

ARCHITECTURE

CONSTRUCTION OPTION

FRESHMAN YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 11	Applied Mathematics and Mechanics	5	5	..	..
Chem. 9*	Chemistry	5	..	3	6
Draw. 34	Graphics	3	..	3	..
Arch. 21	Freehand Drawing	2	..	..	6
1	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 12	Applied Mathematics and Mechanics	5	4	..	2
Chem. 10*	Chemistry	5	..	3	6
Draw. 35	Graphics	3	..	3	..
Arch. 22	Freehand Drawing	2	..	..	6
	Hygiene and First Aid	0	..	1	..
2	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 13	Mathematics and Mechanics	5	4	..	2
Chem. 14*	Chemistry	5	..	3	6
Draw. 36	Graphics	2	..	3	..
Arch. 23	Freehand Drawing	2	..	..	4
3	Military Drill	0	..	..	3

* Students who enter without credit in high-school chemistry must register for Chemistry 6, 7, and 8.

SOPHOMORE YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 21	Applied Mathematics and Mechanics	5	5	..	..
Phys. 3	Elements of Mechanics and Sound	3	1	3	..
Phys. 4	Elements of Mechanics Laboratory	1	..	..	2
Rhet. 4	Rhetoric and Composition	3	3	..	..
Arch. 31	Elements of Architecture	4	..	2	10
Arch. 24	Freehand Drawing	1	..	..	4
4	Military Drill	0	..	..	3
	Winter Quarter				
M. & M. 22	Applied Mathematics and Mechanics	5	5	..	..
Phys. 233	Heat and Light	3	1	3	..
Phys. 24	Heat and Light Laboratory	1	..	..	2
Rhet. 5	Rhetoric and Composition	3	3	..	..
Arch. 32	Elements of Architecture	4	..	2	10
Arch. 25	Freehand Drawing	2	..	..	6
	Hygiene and First Aid	0	..	1	..
5	Military Drill	0	..	..	3
	Spring Quarter				
M. & M. 23	Applied Mathematics and Mechanics	5	5	..	..
Phys. 43	Electricity and Magnetism	3	1	3	..
Phys. 44	Electricity and Magnetism Laboratory	1	..	..	2
Rhet. 6	Rhetoric and Composition	3	3	..	..
Arch. 33	Elements of Architecture	4	..	2	10
Arch. 26	Freehand Drawing	2	..	..	6
6	Military Drill	0	..	..	3

JUNIOR YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. & M. 131	Technical Mechanics	3	3	..	..
M. & M. 134	Strength of Materials	2	2	..	..
M. & M. 141	Materials-Testing Laboratory	1	..	..	3
C. E. 38	Stresses and Structural Design	3	..	1	8
Arch. 14	History of Architecture	2	..	2	..
Arch. 34	Architectural Design	3	..	..	9
Arch. 44	Elements of Construction	2	..	1	5
Econ. 8	Economics	3	3	..	..
	Winter Quarter				
M. & M. 132	Technical Mechanics	3	3	..	..
M. & M. 135	Strength of Materials	3	3	..	..
C. E. 39	Stresses and Structural Design	3	..	1	8
Arch. 15	History of Architecture	2	..	2	..
Arch. 35	Architectural Design	3	..	..	9
Arch. 45	Elements of Construction	2	..	1	5
Econ. 9	Economics	3	3	..	..
	Spring Quarter				
M. & M. 133	Technical Mechanics	2	2	..	..
M. & M. 136	Hydraulics	3	3	..	..
M. & M. 143	Hydraulics Laboratory	1	..	..	3
C. E. 41	Stresses and Structural Design	3	..	1	8
Arch. 16	History of Architecture	2	..	2	..
Arch. 36	Architectural Design	3	..	..	9
Arch. 46	Elements of Construction	2	..	1	5
Econ. 10	Economics	3	3	..	..

SENIOR YEAR

Course no.	Title	Credits	Rec.	Lect.	Lab.
	Fall Quarter				
M. E.	Heat Engines	2	2	..	..
C. E.	Structural Design	4	..	1	12
Arch. 141	Materials of Construction	2	..	2	..
E.E.	Electrical Equipment	3	..	2	3
Arch. 17	History of Architecture	2	..	2	..
Arch. 121	Architectural Seminar	1	..	1	..
	Elective	3	..	..	..
	Winter Quarter				
M. E.	Heat Engines	2	2	..	..
C. E.	Structural Design	4	..	..	12
Arch. 142	Materials of Construction	2	..	2	..
C.E.	Building Sanitation	3	2	..	3
Arch. 18	History of Architecture	2	..	2	..
Arch. 122	Architectural Seminar	1	..	1	..
	Elective	3	..	..	..
	Spring Quarter				
C. E.	Structural Design	4	..	..	12
Arch. 153	Business Relations	2	..	2	..
M. E.	Heating and Ventilating	3	2	1	3
Arch. 19	History of Architecture	2	..	2	..
C. E. 16	Surveying	3	..	..	6
	Elective	3	..	..	

NOTE: Students entering with deficiencies in entrance mathematics will not be permitted to register for Drawing (3) until the second quarter. Such students must enter the summer quarter to complete the resulting deficiencies in freshman required work.

POST-SENIOR YEAR

Work divided into major and minor groups all elective.

Required number of credits, 16.

All students required to take one major and not less than two or more than three minor groups.

Value of major group 10, and of minor group 3 or 2.

Major groups: (a) Architectural Design
(b) Architectural Construction

Minor groups: (a) Painting, Modeling, Figure Composition, Decorative Design
(b) Liberal Studies
(c) Engineering or Technical Studies
- Structures
- Materials Laboratory
- Heating and Ventilation
- Building Sanitation
- Mechanical Equipment of Buildings
- Electrical Equipment of Buildings

(d) Architectural History Research

DEPARTMENTAL STATEMENTS

ARCHITECTURE

Professors FREDERICK M. MANN, LEON ARNAL; Associate Professor JAMES H. FORSYTHE; Assistant Professors SAMUEL C. BURTON, ROY C. JONES, ROBERT T. JONES; Instructor CARL E. JOHNSON; Lecturer ARTHUR R. NICHOLS:

COURSES

No.	Title	Credits	Required of	Prereq. courses
14, 15, 16	History of Architecture.....	2	Soph. Arch.	33
17, 18, 19	History of Architecture.....	2	Jr. Arch.	16
21, 22, 23	Freehand Drawing.....	2	Fr. Arch.	None
24, 25, 26	Freehand Drawing.....	2	Soph. Arch.	23
27, 28, 29	Freehand Drawing.....	2	Jr. Arch.	26
31, 32, 33	Elements of Architecture....	4	Fr. Arch.	None
34, 35, 36	Arch. Design, Elementary....	4	Soph. Arch.	33
34, 35, 36	Arch. Design, Elementary....	3	Soph. Course 2	33
37, 38, 39	Arch. Design, Intermediate...	7	Jr. Arch.	36
131, 132, 133	Arch. Design, Advanced.....	10	Sr. Arch.	39
44, 45, 46	Elements of Construction....	2	Soph. Arch.	33
141, 142	Materials of Construction....	2	Sr. Arch.	C. E. 41
151, 152	Arch. Seminar.....	1	Sr. Arch.	Sr. standing
153	Business Relations.....	2	Sr. Arch.	Sr. standing
161	History of Sculpture and Painting	2	Sr. Arch.	14-15-16
162	Landscape Design.....	2	Sr. Arch.	39
163	Allied Arts.....	2	Sr. Arch.	29

The General Course affords training for the general practice of architecture and, while giving adequate attention to structural studies, lays particular stress on the study of architectural design.

The Optional Course is formulated for those who wish to specialize more in the engineering aspects of architecture with the view of practicing in association with one specializing more particularly in design.

Students who wish to extend and broaden their course in architecture can arrange a six-year schedule leading to the degree of Bachelor of Science in the College of Science, Literature, and the Arts; and Bachelor of Science in Architecture, in the College of Engineering and Architecture.

14. ARCHITECTURAL HISTORY. Technical study of the architecture of ancient Egypt, Assyria, Persia, and Greece, with emphasis on the latter. Study of political, social, and economic conditions affecting the architecture of this period. Illustrated lectures and library research. FORSYTHE.

15. ARCHITECTURAL HISTORY. Technical study of the architecture of ancient Rome and of the Renaissance in Italy to the end of the fifteenth century. Study of political, social, and economic conditions. Illustrated lectures and library sketches and research. FORSYTHE.

16. ARCHITECTURAL HISTORY. Technical study of the architecture of the Renaissance of the sixteenth and seventeenth centuries in Italy. Architecture of the Renaissance in Spain. Illustrated lectures and library research. FORSYTHE.

17. ARCHITECTURAL HISTORY. Technical study of the architecture of the Middle Ages; in Italy, France, and England; sources and influences in the development of the Romanesque and Gothic styles, particularly in France. Lectures and library research. MANN.

18. ARCHITECTURAL HISTORY. Technical study of developed Gothic architecture in France and England. Early Renaissance architecture in France and England, its sources and affecting influences. Lectures and library research. MANN.

19. ARCHITECTURAL HISTORY. Technical study of the development of architecture from the seventeenth century to and including the present time, particularly in France, England, and America. Lectures and library research. MANN.

141-142. MATERIALS OF CONSTRUCTION. The properties and processes of manufacture of building materials, and their uses in construction. MANN.

151-152. ARCHITECTURE SEMINAR. Special topics and topics of current interest. Papers and discussions. MANN, ARNAL, JONES, FORSYTHE.

153. BUSINESS RELATIONS. Relations of the architect, owner, and builder; forms of contracts, professional ethics, and office administration. MANN.

161. History of Sculpture and Painting. Historical study of ancient, Renaissance, and modern sculpture and of the Renaissance and modern schools of painting. Burton.

162. Landscape Design. Theory and practice of landscape design. Lectures and design problems. Nichols.

163. Decoration and the Allied Arts. Color theory. History of decoration and ornament, furniture, weaving, glass-making, etc. Mann.

21-22-23. Elementary Freehand Drawing. Drawing with charcoal, pencil, pen and ink, and color from architectural ornament and details of the figure; drawing from memory. The course is arranged to give an appreciation of balance in light and shade. Burton, Johnson.

21-22-23. Elementary Freehand Drawing. For Science, Literature, and the Arts students. Same as above. Burton.

24-25-26. Freehand Drawing. Drawing from the antique in charcoal, pen and ink, pastel, and pencil. Painting from still life in oils and water-color. Study of the elementary principles of composition and of color arrangement. Burton, Johnson.

27-28-29. Freehand Drawing. Drawing and painting from the antique and from life; figure composition. Study of draperies in preparation for work in decoration, figure composition and the application of the figure to mural decoration. Modeling in clay. Burton.

31. Elements of Architecture. Exercises in instrumental drawing and architectural lettering. Theory and practice of wash rendering. Lectures and library research. Forsythe, R. T. Jones.

32-33. Elements of Architecture. Original problems in the architectural treatment of walls, floors, windows, and mouldings. Lectures and library research. Forsythe, R. T. Jones.

4-5-6. Elements of Architecture. Beginning course for students in the Science, Literature, and Arts course in Architecture and Decoration. Parallel to Course 31-32-33, with addition of instrumental and freehand drawing. Forsythe, Burton.

34-35-36.* Architectural Design. Original problems dealing in general with elements of elevation and their composition into simple architectural units. Sketch problems dealing with elementary plan compositions. Individual criticism and library research. R. T. Jones.

* Work in all the design courses is carried on simultaneously and students pass from one to the next in sequence in varying lengths of time, according to their accomplishment, and irrespective of University time units. The normal time required to complete the design courses is three years. Some students find that they require a longer period and some are able to complete the design work in less time. Those who fall into the former group unit extend their time for graduation and to those able to complete the work in shorter time special advanced work is open.

37-38-39. ARCHITECTURAL DESIGN. Original problems dealing in general with the elements of plan. Composition of simple complete buildings. Sketch problems dealing with plan composition. Individual and general criticism and library research. ARNAL.

44. BUILDING CONSTRUCTION. Studies of plans and working drawings of frame and masonry buildings. Lectures, measured drawings of important details of construction. Written reports from buildings under construction. R. T. JONES.

131-132-133. ARCHITECTURAL DESIGN. Original problems dealing with composition of single buildings or groups of buildings and those of special character. Subjects of decorative or imaginative interest. Sketch problems. ARNAL.

44-45-46. ELEMENTS OF CONSTRUCTION. Preparation of working drawings of frame and masonry buildings. Specifications. Measured drawings of details of construction. Written reports of buildings under construction. R. T. JONES.

CHEMISTRY

Professors CHARLES A. MANN, CHARLES F. SIDENER; Associate Professors EVERHART P. HARDING, FRANK H. MACDOUGALL, M. CANNON SNEED; Assistant Professors ISAAC W. GEIGER, LAWRENCE M. HENDERSON; RAYMOND E. KIRK.

COURSES

No.	Title	Credits	Required of	Prereq. courses
6-7-8	General Inorganic Chemistry..	15	Fr.	None
9-10	General Inorganic Chemistry..	10	Fr.	H.-s. chem.
14	Qualitative Analysis.....	5	Elective	8 or 10
20	Quantitative Analysis.....	3	Elective	11
60	Power-Plant Chemistry.....	3	Elective	20
140-141-142	Physical Chemistry.....	5	Elective	2 yrs. (col. chem. & 1 yr. phys.)
176-177	Applied Electrochemistry.....	3 or 4	Elective	Physics

6-7-8. GENERAL INORGANIC CHEMISTRY. For those who have had no high-school chemistry. Includes a study of the general laws of chemistry and of the non-metals and their compounds. KIRK.

9. GENERAL INORGANIC CHEMISTRY. Designed for those who have had one year of high-school chemistry. A study of the general laws of chemistry and of the non-metals and their compounds. A study of the metals and their compounds. Continuation of Course 9. More intensive than Course 6-7-8. KIRK.

14. QUALITATIVE ANALYSIS. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry. KIRK.

20. QUANTITATIVE ANALYSIS. An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. SIDENER, GEIGER.

60. POWER-PLANT CHEMISTRY. Proximate analysis of coal determination of calorific power; technical analysis of fuel gases and furnace gases; examination of boiler water; lubricating oils. HARDING.

140. PHYSICAL CHEMISTRY. A general survey of the subject. Three lectures and one recitation. Laboratory work six hours per week. MACDOUGALL.

176-177. APPLIED ELECTROCHEMISTRY. Application of the electric current to chemical processes. Laws and phenomena of electrochemistry, primary and secondary batteries, electroplating, electric furnace construction and operation, and the products of electrolysis of the electric furnace. MANN.

CIVIL ENGINEERING

Professors FREDERICK BASS, JOHN I. PARCEL; Associate Professor ALVIN S. CUTLER; Assistant Professors GEORGE A. MANEY, OTTO S. ZELNER; Instructors CHARLES H. DOW, MAURICE B. LAGAARD, FRED C. LANG.

COURSES

No.	Title	Credits	Required of	Prereq. courses
11	Surveying	3	Soph. C. E.	Math. 13, Draw.
12	Surveying	3	Soph. C. E.	C. E. 11
13	Surveying	3	Soph. C. E.	C. E. 12
14	Surveying	3	Jr. C. E.	C. E. 13
16	Surveying	3	Sr. Arch. eng. elective M. E., E. E.	
17	Surveying	1	Sr. Arch.	Math. 13
21	Surveying	3	Jr. C. E.	C. E. 11
22	Surveying	3	Jr. C. E.	C. E. 21
23	Summer Camp	9	Jr. C. E.	C. E. 22
121	Railway Engineering	3	Elective, sr. C. E.	C. E. 23
122	Railway Engineering	3	Elective, sr. C. E.	C. E. 121
123	Railway Engineering	3	Elective, sr. C. E.	C. E. 122
124	Transportation	3	Elective, sr. C. E.	C. E. 123
125	Transportation	3	Elective, sr. C. E.	C. E. 124
31	Stresses in Structures	3	Jr. C. E.	Math. 23, Draw. 23
32	Stresses in Structures	3	Jr. C. E.	C. E. 31
33	Elementary Structural Design	3	Jr. C. E.	C. E. 32
131	Bridge Analysis	4	Sr. C. E.	C. E. 33
132	Bridge Design	3	Sr. C. E.	C. E. 131
133	Bridge Design	3	Sr. C. E.	C. E. 132
35	Structural Engineering	3	Jr. M.E.	Math. 23
36	Structural Engineering	2	Jr. M. E.	C. E. 35
37	Structural Engineering	3	Elective, jr. E. E.	Math. 23
38	Stresses	3	Jr. Arch.	Math. 93
39	Structural Design	3	Jr. Arch.	C. E. 38
41	Reinforced Concrete	3	Jr. Arch.	Math. 93
141	Reinforced Concrete	3	Sr. C. E.	C. E. 141
142	Reinforced Concrete	3	Sr. C. E.	C. E. 142
143	Foundations	3	Sr. C. E.	Math. 136

No.	Title	Credits	Required of	Prereq. courses
144	Reinforced Concrete.....	2	Elective (sr. M. E., sr. E. E.)	Math. 133 and 134
51	Highways and Pavements....		Jr. C. E.	C. E. 12
52	Highways and Pavements....		Jr. C. E.	C. E. 12
53	Municipal Engineering.....		Jr. C. E.	
161	Hydrology.....	4	Sr. C. E.	
162	Water Supply.....	4	Sr. C. E.	Math. 136
163	Sanitary Engineering.....	3	Sr. C. E.	Math. 136
164	Water Power.....	3	Sr. C. E.	Math. 136
165	Water Power.....	3	Sr. C. E.	C. E. 164
171	Building Sanitation.....	2	Sr. Arch.	
221-222-223	Railway Administration.....			C. E. 122
224	Railway Terminals and Yards			C. E. 122
261	Water and Sewage Purification			C. E. 162
262	Water-Supply Problems.....			C. E. 162
263	Hydraulic Laboratory.....			C. E. 164
251	Highway Laboratory.....			C. E. 51-52
271	Building Sanitation.....			
272	City-Planning			C. E. 51
273	Industrial Sanitation.....			
264	Water Power.....			C. E. 164
265	Drainage and Flood Control..			C. E. 161
266	River Improvement.....			C. E. 161
231-232-233	Indeterminate Structures.....			C. E. 133, 142
234-235-236	Advanced Structural Design..			C. E. 133, 142
252	Highway Administration.....			C. E. 51-52
243-244	Cement and Concrete Laboratory			C. E. 142
237-238	Structural Laboratory.....			C. E. 133
245-246-247	Reinforced Concrete Analysis			C. E. 142

11. SURVEYING. Field problems; use of chain, compass, transit, and level. Computation and platting of surveys made in the field. Determination of area by D. M. D. method and planimeter. CUTLER.

12. SURVEYING. Lectures and drawing-room. Platting of maps, profiles, and cross-sections. Computation of earthwork quantities. United States public land surveys. Conventional signs. ZELNER.

13. SURVEYING. Adjustments of instruments, profile and differential leveling, transit surveys, stadia method. CUTLER.

14. SURVEYING. A complete topographical survey, stadia method, is made and platted. ZELNER.

16. SURVEYING. A short course in the use, care, and adjustment of surveying instruments. Methods of leveling and transit surveys. Offered to students other than civil engineers.

17. SURVEYING. Special course for senior architects.

21. SURVEYING. A study of United States Geological Survey and railroad topographic maps with special reference to the location of a railway. A general survey of the problem of railway location, including grades, curvature, rise and fall, etc. CUTLER.

22. SURVEYING. Field and drafting-room. Simple, compound, and spiral curves. Observations for determination of meridian. Elements of hydrographic and precise surveying. All preparatory to more extended work in summer camp. CUTLER, ZELNER.

23. SUMMER CAMP. Six weeks immediately preceding the beginning of the senior year. Continuation of Course 22, including extended railroad, topographic, hydrographic, and triangulation surveys. CUTLER, ZELNER.

121. RAILWAY ENGINEERING. Design and construction of railroad buildings and structures; culverts, wooden trestles, switches, crossovers, crossing frogs, etc. Method of computing earthwork, and estimates and reports. Distribution of material by means of mass diagram. CUTLER.

122. RAILWAY ENGINEERING. Train resistance, ruling and momentum grades, curvature, distance, rise and fall, as factors in location and operation of railroads. Train-loading, acceleration, retardation; locomotives and equipment. Operating costs governing grade revision. CUTLER.

123. RAILWAY ENGINEERING. Lectures, office work, and field inspection. Design and operations of various types of yards and terminals, and terminal facilities, including the hump, engine house, coal and water station. Signalling and interlocking. CUTLER.

124. TRANSPORTATION. Railway, highway, ocean and inland waterway transport, motive power and car equipment, operating problems, railway, water, and joint terminal problems, typical design and equipment. Cost and value of service, valuation, regulation, present systems and organizations.

125. TRANSPORTATION. Specific illustrative problems: Twin City and Mississippi Valley traffic situation, Mississippi River experiment, New York Barge Canal, Great Lakes traffic, St. Lawrence River project, Panama Canal status. Rapid transit, motor transport. Aerial transport. ———

31. STRESSES IN STRUCTURES. Algebraic and graphic analysis of various types of roof and bridge trusses for fixed loading. PARCEL.

32. STRESSES IN STRUCTURES. Moving loads and influence lines. Standard engine loadings and equivalent uniform loads. PARCEL.

33. ELEMENTARY STRUCTURAL DESIGN. Designing principles and methods. Complete design and detail drawing of framed mill building bent. PARCEL.

131. BRIDGE ANALYSIS. Stresses in simple span railway bridge trusses of the larger type. Baltimore, Petit, Whipple, and "K" trusses. MANEY.

132. BRIDGE DESIGN. Design and detail drawing of railway plate girder viaduct. MANEY.

133. BRIDGE DESIGN. Complete design and detail drawing of railway pin truss span. MANEY.

35. STRUCTURAL ENGINEERING. (For Mechanical Engineers.) Analysis of stresses in simple structural frames. Roof trusses, crane trusses, mill building bent. MANEY.

36. STRUCTURAL ENGINEERING. (For Mechanical Engineers.) Brief treatment of main features in design of beams, columns, plate girders, and roof truss. MANEY.

37. STRUCTURAL ENGINEERING. (For Electrical Engineers.) Short course covering similar ground to Courses 35 and 36. MANEY.

38. STRESSES IN STRUCTURES. Application of laws of equilibrium to simple structures. Special emphasis is placed on graphic methods. MANEY.

39. STRUCTURAL DESIGN. General principles of structural design. Girders, columns, and roof trusses. MANEY.

41. REINFORCED CONCRETE. Brief course in theory and designing methods with special reference to buildings. MANEY.

141. REINFORCED CONCRETE. Principles of reinforced concrete. Theory of beams, slabs, and columns and the application to ordinary structures. MANEY.

142. REINFORCED CONCRETE DESIGN. Continuation of 141 with especial emphasis on the practical features of the design of buildings, bridges, retaining walls, etc. MANEY.

143. MASONRY AND FOUNDATIONS. Brief study of masonry structures in general. Theory of earth pressure; walls, footings, dams, ordinary and deep foundations. MANEY.

144. REINFORCED CONCRETE. A short course for mechanical and electrical engineers embracing the principal features of 141. LAGAARD.

51. HIGHWAYS AND PAVEMENTS. Elementary course with field inspection, relating to the economics, location, construction, and maintenance of highways and pavements. LANG.

52. HIGHWAYS AND PAVEMENTS. Continuation of Course 51, with laboratory practice. LANG.

53. MUNICIPAL ENGINEERING. Development of municipal public works. City-planning, transportation, and housing. The principles of public health and sanitation. Public water supplies, sewerage and sewage disposal, refuse collection and disposal, the sanitation of buildings. BASS.

161. HYDROLOGY. Rainfall, evaporation, transpiration, percolation, run-off. Flood and low-water flows of streams. Storage for use in water supply, water power, irrigation, and navigation. Mass curves and frequency curves. BASS.

162. WATER-SUPPLY ENGINEERING. Sources of water supply; quality of water. Laboratory methods of testing water; wells, surface-water intakes, conduits and pipe lines, distribution systems, and purification plants. Selection of pumping machinery and motive power. BASS.

163. SANITARY ENGINEERING. Quantities of sewage and storm water; precipitation and run-off. Sanitary sewer system for a small community; storm-water system for a city district. Stream pollution and sewage disposal. BASS.

164-165. WATER POWER. Types of low, medium, and high-head developments. Details of developments. Spillway dams; hollow reinforced concrete dams, arch dams, high masonry dams, movable dams. Turbine settings and characteristics.

171. BUILDING SANITATION. The location and orientation of buildings; lighting, ventilation, water supply, plumbing, sewage, and refuse disposal. BASS.

221-222-223. RAILWAY ADMINISTRATION. An analysis of railway organization and methods of management and operation. Principles of valuation and rate-making. CUTLER.

224. RAILWAY TERMINALS AND YARDS. A continuation of Course 123. CUTLER.

261. WATER AND SEWAGE PURIFICATION. Continuation of Course 163. Design of water purification and sewage disposal. BASS.

262. WATER-SUPPLY PROBLEMS. Continuation of Course 162. BASS.

263. HYDRAULIC LABORATORY. Study of special hydraulic problems in laboratory, drafting-room, and field. ———

251. HIGHWAY LABORATORY. Investigations in coöperation with State Highway Department. LANG.

252. HIGHWAY ADMINISTRATION. Problems of highway administration and finance. LANG.

271. BUILDING SANITATION. A design course in the sanitation of buildings. Heating and ventilating, plumbing, lighting. Housing problems. BASS, ROWLEY.

272. CITY-PLANNING. The physical elements of the city; topography, drainage, geology. Public works and structures. Street arrangements; rapid transit; railroad terminals. City-districting. Subsurface structures. Esthetic features of the city; the civic center; parks; boulevards; public buildings. BASS, MANN.

273. INDUSTRIAL SANITATION. Principles of public health. Methods in use for prevention of disease. Sanitation and hospital service in factory buildings and grounds. Housing problems. Welfare work. BASS.

264. WATER POWER. Detailed design of hollow reinforced concrete arch, and high masonry dams. Design of power house from forebay to tail-race for typical developments. Pipe lines, reservoirs, surge tanks. Inspection of plants. ———

265. DRAINAGE AND FLOOD CONTROL. Study of special problems. ———

266. RIVER IMPROVEMENTS. River hydraulics and the maintenance of regimen. The improvement of rivers for navigation, etc. The economics of water transportation. ———

231-232-233. STATICALLY INDETERMINATE STRUCTURES. General theory deflections and statically indeterminate stresses and its application to continuous girders, swing bridges, arches, redundant members, secondary stresses, and wind stresses in office buildings. PARCEL, MANEY.

234-235-236. ADVANCED STRUCTURAL DESIGN. Fundamental theory of stresses applied to special problems. Stress distribution in girders, riveted joints. Bending of straight bar. Built-up compression members. Impact and fatigue. Relative economy in design. Comparative study of specifications. PARCEL.

237-238. STRUCTURAL LABORATORY. Similar to 243, but dealing mainly with experimental problems in structural steel. Strain gauge study of actual stress distribution in beams, columns, and riveted joints. LAGAARD, MANEY.

243-244. CEMENT AND CONCRETE LABORATORY. Laboratory technic and experimental investigation of special problems in cement, concrete, and reinforced concrete. LAGAARD.

245-246-247. REINFORCED CONCRETE ANALYSIS. Critical review of the literature of reinforced concrete and study of the advanced theory. Study of test data and analysis of stresses in reinforced concrete structures. LAGAARD, MANEY.

DRAWING AND DESCRIPTIVE GEOMETRY

Professor WILLIAM H. KIRCHNER; Assistant Professor ROBERT W. FRENCH; Instructors LEON ARCHIBALD, JOHN O. CEDERBERG, HENRY C. T. EGGERS, HENRY E. HARTIG, EDGERTON W. KIBBEY, CARROLL E. LEWIS, HOWARD D. MYERS, ORRIN W. POTTER, ROBERT F. SCHUCK, WILLIAM S. WILLIAMS.

COURSES

No.	Title	Credits	Required of	Prereq. courses
1	Engineering Drawing.....	3	Fr. Eng.	Solid geometry & higher algebra
2	Engineering Drawing.....	3	Fr. Eng.	1
3	Descriptive Geometry.....	3	Fr. Eng.	2
21	Drafting	2	Soph. C. E.	3
22	Drafting	2	Soph. C. E.	21
23	Drafting	2	Soph. C. E.	22

No.	Title	Credits	Required of	Prereq. courses
27	Drafting	2	Soph. E. E. & M. E.	3
28	Drafting	2	Soph. E. E. & M. E.	27
31	Graphics, Course 1.....	2	Fr. Arch.	..
32	Graphics, Course 1.....	2	Fr. Arch.	31
33	Graphics, Course 1.....	2	Fr. Arch.	32
34	Graphics, Course 2.....	3	Fr. Arch.	..
35	Graphics, Course 2.....	3	Fr. Arch.	34
36	Graphics, Course 2.....	3	Fr. Arch.	35
39	Lettering	2	Elective	..
111-112	Advanced Descriptive Geometry	6	Elective	3, Calculus
113	Perspective	3	Elective	33
115	Geometry	3	Elective	Calculus

1. ENGINEERING DRAWING. The elements of drafting including an introductive course in the methods of representation and constructive geometry. Graphs and formulas. Sketching, lettering, working drawings, conventions, standards, tracing and blue printing. KIRCHNER, ARCHIBALD, EGGERS, HARTIG, KIBBEY, LEWIS, MYERS, POTTER, SCHUCK, WILLIAMS.

2. ENGINEERING DRAWING. A continuation of Course 1.

3. DESCRIPTIVE GEOMETRY. An elementary course in the methods of representation, correlated in part with analytical geometry. Graphical and algebraic solutions. Lectures, demonstrations, and drawing-room exercises. KIRCHNER, ARCHIBALD, EGGERS, HARTIG, KIBBEY, MYERS, LEWIS, POTTER, SCHUCK, WILLIAMS.

21. DRAFTING. Drawing of structures and machines. Detail, assembly, and construction drawings. The solution of problems of simple structures. FRENCH, MYERS.

22. DRAFTING. Continuation of Course 21. Drafting problems in concrete, highway, and topographical work as met by the civil-engineering draftsman in practice. Intersections, developments, and other practical geometric problems. FRENCH, MYERS.

23. DRAFTING. Continuation of Course 22. FRENCH, MYERS.

27. DRAFTING. The application of descriptive geometry to drafting-room problems. Sheet metal work, belting conveyors, and connections. Working drawings and tracing. EGGERS, HARTIG, MYERS.

28. DRAFTING. The application of elementary formulas in the proportioning of simple machine parts. Outline and assembly drawings, structural drafting, the development of simple formulas, and graphical methods. EGGERS, HARTIG, MYERS.

31-32-33. GRAPHICS. Architectural shades and shadows. Pure and applied perspective. Theorems, methods, and the solution of problems. KIRCHNER.

34-35-36. GRAPHICS. Exercises in constructive and descriptive geometry, with applications. Shades and shadows. Pure and applied perspective. KIRCHNER and Assistants.

39. LETTERING. The analysis of the alphabets. Exercises in Roman and Gothic lettering. Design and composition of the paragraph and the title. KIRCHNER and Assistants.

111-112. ADVANCED DESCRIPTIVE GEOMETRY. Methods of representation; parallel and central projection. Curves and surfaces. Geometrography, axonometry, and photogrammetry. KIRCHNER.

113. PERSPECTIVE. The principles and practice of perspective, including shadows, reflections, distortions, corrections, systems, methods, the practical problem, and inverse construction. KIRCHNER.

115. GEOMETRY. Pure and applied. Transformations, perspective, kinematics, stereomtomy, graphic statics, graphic calculus, nomography. KIRCHNER.

ECONOMICS

Professors GEORGE W. DOWRIE, ROY G. BLAKEY, JEREMIAH S. YOUNG; Assistant Professors Z. CLARK DICKINSON, HOWARD S. NOBLE, J. WARREN STEHMAN; Instructors JOSEPH E. CUMMINGS, VICTOR H. PELZ; Assistant HARRY J. OSTLUND.

COURSES

No.	Title	Credits	Required of	Prereq. courses
8f-9w-10s	General Economics (for engineers)	9*	Elective	None
23f	Principles of Organization and Management (for engineers)	3	Elective	Seniors without prereq. or juniors with 8-9-10 or equiv.
27s	Principles of Accounting (for engineers)	4	Elective	None
51f-52w-53s	Business Law	9*	Elective	10 cr. econ. or pol. sci. or 5 in each
57w	Business Finance (for engineers)	3	Elective	8-9-10 or equiv.
73w	Railway Traffic and Rates	3	Elective	3-4 or 5, and 6
74s	Water Transportation	3	Elective	3-4 or 5, and 6
85f-86w	Marketing of Manufactured Products	6*	Elective	3-4 or 5 and 6, and 9 other cr. in econ.
131f	Cost Accounting	3	Elective	25-26
132w-133s	Industrial Accounting	6*	Elective	131
154s	Public Utilities	3	Elective	54

No.	Title	Credits	Required of	Prereq. courses
166f	Employment and Personnel Management	3	Elective	3-4 or 5, and 6 Psy. 1-2-3 or equiv.
167w	Industrial Relations.....	3	Elective	3-4 or 5, and 6, 23

* All quarters must be completed before credit is given for any quarter.

8f-9w-10s.* General Economics. (For engineers.) Principles of economics with special emphasis upon their application to current problems such as money, banking, conservation, insurance, international commerce, monopolies, transportation, labor socialism, public ownership and finance. Blakey and others.

23f. Principles of Organization and Management. (For engineers.) Types of operating organization; specialization; coördination of men and departments, planning; delegation of authority; means of control; establishment and maintenance of standards for materials, operation, machinery; determination of business policies; personnel problems. Pelz.

27s. Principles of Accounting. (For engineers.) The purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts and other statements. Three hours of lecture and one laboratory period a week. Ostlund.

57w. Business Finance. (For engineers.) A study of the principles of financing business concerns. Banking facilities from the viewpoint of the business man. The organization and financial management of corporations with special reference to the various types of corporate securities. Stehman.

51f-52w-53s.* Business Law. Principles governing ordinary business transactions. Contracts—formation, operation, interpretation, breach, and discharge. Agency and service. Negotiable instruments. Business associations—partnerships and private corporations. Property—personal and real. Young.

73w. Railway Traffic and Rates. Railway transportation from standpoint of the business man and shipper. Freight-shipping documents. Classification and tariffs, time and preference freight, private car lines, industrial trackage and terminal service, express rates and service, special passenger rates. Cummings.

74s. Water Transportation. History and present status of inland waterway and ocean transportation in the United States with some reference to present development in representative foreign countries. Problems peculiar to water transportation in the United States. Cummings.

85f-86w.* MARKETING OF MANUFACTURED PRODUCTS. Organization of distributive channels; marketing of basic raw materials and manufactured products; relations, selling problems and methods of manufacturers, wholesalers, retailers, and other factors in the distributive system; price policies; price maintenance. PELZ.

131f. COST ACCOUNTING. General principles of cost accounting; elements of cost; methods of arriving at costs, and of distribution overhead; application of cost accounting principles to selling, banking, mining, farming, etc. NOBLE.

132w-133s.* INDUSTRIAL ACCOUNTING. Continuation of cost accounting with attention on factory accounting; a critical study of various cost systems and their application to particular types of industry; practical experience through constructive problems. NOBLE.

154s. PUBLIC UTILITIES. Economic and legal bases of classification. Relative advantages of public ownership and regulation. Central and municipal regulation compared. The basis of rates; relative rates; rates and service. Summary of the theories of valuation.

166f. EMPLOYMENT AND PERSONNEL MANAGEMENT. Organization and routine of employment department; methods of selecting employees, records, follow-ups; standardization of labor requirements; problems of labor turn-over; service and welfare features, as safety, education recreation. Study of practice in representative establishments. Written report. DICKINSON.

167w. INDUSTRIAL RELATIONS. Broader problems of labor policy, from standpoint of management. Wage systems, labor cost, profit-sharing; scientific management and labor; collective bargaining, works councils or shop committees; their relations to trades unions. Studies of practice, and written report by student. DICKINSON.

ELECTRICAL ENGINEERING

Professors GEORGE D. SHEPARDSON, FRANK W. SPRINGER; Associate Professor WILLIAM T. RYAN; Assistant Professor EDWIN R. MARTIN; Professorial Lecturer CHARLES L. PILLSBURY; Instructors CYRIL M. JANSKY, JR., GEORGE W. SWENSON, MILO E. TODD; Master Signal Electrician JOEL R. BAKER; Assistant HARRY W. DIXON.

COURSES

No.	Title	Credits	Required of	Prereq. courses
11-13-15	Elements of Electrical Eng...	9	Soph. E. E.	Reg. in physics
111-113-115	Direct-Current Machinery....	9	Jr. E. E.	15
112-114-116	Direct-Current Mach. Lab....	6	Jr. E. E.	15
121-123-125	Alternating Currents.....	9	Sr. E. E.	115
122-124-126	Alternating-Current Lab.....	6	Sr. E. E.	116
186	High-Tension Testing.....	2	Elective	

No.	Title	Credits	Required of	Prereq. courses
221-223-225	Transients	6	Elective	121
132-134-136	Electrical Design	6	Sr. E. E.	115
232-234-236	Advanced Design	2-6	Elective	136
237	Power Transmission Line Design	3	Elective	236
40	Electrical Wiring and Equip.	2	Sr. Arch.	Physics
41	Electric Power	3	Sr. Mines	Physics
42	Electric Power	4	Sr. Civil	Physics
43-44-45	Electric Power	9	M. E. and chem.	Physics
143	Power-Plant Operation	1	Elective	116 or 45
146	Batteries and Elec. Vehicles	1	Elective	113 or 45
144	Railway Electrical Eng.	2	Elective	115 or 42 or 45
145	Railroad Electrification	2	Elective	144
141	Central Stations	2	Elective	Reg. in 121
142	Electrical Transmission	2	Elective	141
147	Elec. Equip. of Buildings	2	Elective	115 or 41 or 45
151	Electric Lighting	2	Elective	Physics
152	Photometric Laboratory	1-2	Elective	Reg. in 151
251-253	Illuminating Engineering	2-4	Elective	151
252-254	Illuminating Laboratory	2-4	Elective	Reg. in 251
61-63-65	Electrical Communication	2-3	Elective	15
164	Telegraph and Telephone Apparatus	2-3	Elective	65
165-166	Tel. and Tel. Circuits	4-6	Elective	Reg. in 123
161-162-163	Radio Communication	3-9	Elective	Reg. in 121
261	Mathematical Theory of Vacuum Tube	3	Elective	163
181-182	Undergraduate Thesis	3-6	Elective	121
183-184-185	Adv. Electrical Laboratory	2-6	Elective	116
281-282	Adv. A. C. Measurements	2-4	Elective	126
284-285-286	Precise Elec. Measurements	2-6	Elective	122
287-288-289	Graduate Thesis	9-18	Gr.	125
91	Inspection Trip	1	Elective	None
92	Engineering Relations	1-3	Elective	None
191-192-193	Seminar	1-3	Elective	111
291-292-293	Graduate Seminar	1-3	Elective	126
294-295-296	Electrical Ignition	2-6	Elective	124
297	Electrochemistry	2	Elective	116 or 45
299	Valuation of Public Utilities	1	Elective	123 or 42 or 43

11-13-15. ELEMENTS OF ELECTRICAL ENGINEERING. Introduction to the development, principles, materials, safety, and general application of electrical engineering. Lecture, class, and laboratory. Open to students registered for physics. SHEPARDSON, SWENSON, TODD.

111-113-115. DIRECT-CURRENT MACHINERY. Electrical engineer measuring instruments and their use, units, theory of dynamo-electric machinery, methods of regulation, construction and operation of generators and motors, methods of testing. SPRINGER.

112-114-116. DIRECT-CURRENT MACHINERY LABORATORY. To be taken with Course 111-113-115. Electrical engineering measurements, calibration of instruments, operation and characteristic curves of generator and motor. Lectures and practice. MARTIN, SWENSON.

121-123-125. ALTERNATING CURRENTS. Phenomena, measurement, and use of alternating currents, theory of line, transformer, generator, and motor, types of apparatus. RYAN.

122-124-126. ALTERNATING-CURRENT LABORATORY. To be taken with Course 121-123-125. Experimental study of alternating currents, regulation and efficiency tests of alternators, transformers, motors, and rotaries. SPRINGER, RYAN.

221-223-225. TRANSIENT ELECTRIC PHENOMENA. Transient phenomena accompanying change of circuit conditions. Abnormal currents, voltages, frequencies produced by switching, short circuits, arcing grounds; distributed capacity, inductance, standing waves, etc.; power and energy of complex circuits. JANSKY.

132-134-136. ELECTRICAL DESIGN. The design of direct current generators and motors, and alternating current transformers; complete working drawings and specifications to accompany each design. The design of alternating-current generators and motors and switch-boards. RYAN.

232-234-236. ELECTRICAL DESIGN. Special problems. RYAN.

237. POWER TRANSMISSION LINE DESIGN. Preparation of detailed plans and specifications for the construction of high-voltage transmission lines and distributing systems. Economic electrical and mechanical principles and calculations. Overhead and underground lines. Transmission line supports. RYAN.

40. ELECTRIC WIRING AND EQUIPMENT. Elementary principles of direct and alternating current circuits. Interior wiring and electrical equipment of buildings. Elements of calculation of illumination. Some detailed study of plans and specifications. For senior architects. RYAN.

41. ELECTRIC POWER. Elementary principles of continuous currents, generators, and motors. Elementary principles of alternating currents, generators, transformers, and motors. Measurement of power. Elementary principles of transmission and distribution. Lectures, recitations, and laboratory work. For senior students in the School of Mines. Open to seniors in Architecture. RYAN, SWENSON.

42. ELECTRIC POWER. Similar to Course 41s. For seniors in Civil Engineering. RYAN, SWENSON.

43-44-45. ELECTRIC POWER. An elementary study of the problems involved in the generation, distribution, measurement, and utilization of electric power. Lectures, recitations, and laboratory work, supplemented by numerous problems. For seniors in Mechanical Engineering and Chemistry. MARTIN.

141. CENTRAL STATIONS. Electric power generating stations and distributing systems; load diagrams; selection of prime movers and units; cost of electrical energy; methods of charging; maintenance of plants; emergencies. RYAN.

142. ELECTRICAL TRANSMISSION. Considerations involved in the designing and building of transmission lines, Kelvin's law and its limitations, the transmission line as a mechanical structure, lightning arresters, study of particular high-tension lines. RYAN.

143. POWER PLANT OPERATION. Practice in operation and care of gas producer, gas engine, boilers, engines, turbine, dynamos, battery, switchboards, and auxiliary apparatus of the University lighting plant. RYAN, MARTENIS, DIXON.

144. RAILWAY ELECTRICAL ENGINEERING. History, development, economics, principles of mechanics applied to electric train movements, motor characteristics, control systems, substations, railway problems, speed time curves, and time schedules. Lectures and recitations. MARTIN.

145. STEAM RAILROAD ELECTRIFICATION. Reasons for electrification, study of European and American systems, trolley and third-rail construction, variation in locomotive design, performance as compared to steam locomotives, electrical features, results of electrification as to service and economy. Lectures, assignments. MARTIN.

146. BATTERIES AND ELECTRIC VEHICLES. Theory of the storage battery as used in electric trucks and automobiles; electric automobile equipment; charging devices, such as mercury arc and vibrating rectifiers and special synchronous converters. RYAN, MARTIN.

147. ELECTRIC EQUIPMENT OF BUILDINGS. Lectures on electrical equipment of modern office and factory buildings. Detailed study of plans and specifications. Inspection and reports on jobs under construction and after completion. Special lecturers.

151. ELECTRIC LIGHTING. Principles of vision, photometers, and measurement of light, methods and calculations of illumination, various sources of light, development of electric illuminants, distribution systems. Lectures and problems. SHEPARDSON, MARTIN.

152. PHOTOMETRIC LABORATORY. Photometric studies of incandescent and arc electric lamps, gas and oil lamps. Bench and radical photometers and illuminometers. SHEPARDSON, MARTIN.

251-253. ILLUMINATING ENGINEERING. Performance of electric and gas lamps, reflectors and diffusers, luminous efficiency, distribution, color characteristics, physiological phenomena, methods of determining location, kind, and quantity of light for obtaining desired illumination. SHEPARDSON.

252-254. ILLUMINATION LABORATORY. Laboratory tests of shades and fixtures. Tests of lighting installations. SHEPARDSON, MARTIN.

61. ELEMENTS OF COMMUNICATION. TELEGRAPH. Importance of communication. Comparison of methods. General theory of telegraph apparatus.

Simplex, duplex, and induction telegraphs. Ground telegraphy. Locating grounds. Batteries and battery charging. Lectures with laboratory practice. SHEPARDSON, BAKER, and Assistants.

63. ELEMENTS OF COMMUNICATION. TELEPHONE. Nature of speech sounds. Essential parts of telephone system. General theory and construction of telephone apparatus. Telephone circuits. Cable-testing and splicing. Lecture and laboratory study of commercial and military telephone apparatus. SHEPARDSON, BAKER, and Assistants.

65. ELEMENTS OF COMMUNICATION. RADIO. Elementary study of damped sending sets, crystal receiving sets and vacuum tubes. Use of army and commercial apparatus. Field practice with military equipment. United States rules governing radio transmission. Message forms. Lecture and laboratory. JANSKY, BAKER, and Assistants.

161. RADIO COMMUNICATION. Mathematical theory of damped wave telegraphy. Logarithmic decrement, Kolster decremeter, and coupling coefficient. Design and use of army and commercial apparatus. Inductance and capacity measurements with damped frequencies. JANSKY.

162. RADIO COMMUNICATION. Undamped wave telegraphy. Theory of heterodyne reception. Arc, generator, and vacuum tube as sources of high frequency power. Ground telegraphy. High-power stations. JANSKY.

163. RADIO COMMUNICATION. Advanced theory of vacuum tubes. Radio telephony. Dynamic characteristics of vacuum tubes. High-frequency measurements. Direction finding. JANSKY.

164. TELEGRAPH AND TELEPHONE APPARATUS. Theoretical and experimental study of apparatus used for signaling, telegraphy, and telephony. Lecture and laboratory. SHEPARDSON, SWENSON.

165-166. TELEGRAPH AND TELEPHONE CIRCUITS. Theoretical and experimental study of telegraph and telephone circuits and the phenomena of long-line transmission. Applications of hyperbolic functions. Phantoms, loading, repeaters. Inductive disturbances, transpositions. Multiplex telephony. SHEPARDSON, SWENSON.

261. MATHEMATICAL THEORY OF VACUUM TUBES. Review of current literature on the theory of vacuum tubes and vacuum-tube circuits. Lectures. JANSKY.

181-182. UNDERGRADUATE THESIS. An investigation of some approved problem in electrical engineering. SHEPARDSON, SPRINGER, RYAN, MARTIN, JANSKY, SWENSON.

183-184-185. ADVANCED ELECTRICAL LABORATORY. Efficiency tests and special problems.

186. HIGH-TENSION TESTING. Low-frequency pressure to 320,000 volts, high-frequency to several million volts, applied to study of dielectric phenomena, such as testing of high-tension transmission cables, transformer oil, transmission line insulators. Laboratory and library reference course. SPRINGER.

281-282. ADVANCED ALTERNATING-CURRENT MEASUREMENTS. Bridge circuits for the measurement of resistance, inductance, and capacity at audio and radio frequencies. Change of resistance with frequency. Vector treatment of bridge circuits. Lecture and laboratory. JANSKY.

284-285-286. PRECISE ELECTRICAL ENGINEERING MEASUREMENTS. Lectures and laboratory work. Precise measurements of resistance, voltage, current, self-induction, and capacity; standardization of measuring instruments. SPRINGER.

287-288-289. GRADUATE THESIS. An investigation of an approved problem in electrical engineering. The major work of the graduate year will center about the thesis, which should constitute a real contribution to knowledge.

91. ENGINEERING INSPECTION TRIP. Personally conducted inspection of factories, power p'ants, and other places of engineering interest, usually including Milwaukee, Chicago, and Gary. Occupies the Easter recess costing about $50 for each person. Open to seniors, juniors and sophomores.

191-192-193. SEMINAR. Weekly discussion of current electrical periodicals. SHEPARDSON.

291-292-293. GRADUATE SEMINAR. Continuation of Course 191-192-193.

294-295-296. ELECTRICAL IGNITION AND AUTOMOBILE ELECTRICAL ACCESSORIES. Oscillographic, rotating mirror, rotating gap, and electrical measurements applied to the study of ignition apparatus; characteristics of automobile accessories, such as generators, starters, controllers, electrical transmitting devices, etc. Laboratory and lectures. SPRINGER.

297. ELECTROCHEMICAL ENGINEERING. Theoretical and experimental study of the engineering problems of electrolytic and electrothermal processes. SHEPARDSON.

299. VALUATION OF PUBLIC-UTILITY PROPERTIES. Cost of organizing and securing capital, discounts on bonds, fees; franchise values. Depreciation and obsolescence, deferred maintenance. Public utilities, fair rates and returns, regulation of natural monopolies. PILLSBURY.

92. ENGINEERING RELATIONS. Lectures, assigned reading, and discussions on the human side of engineering. Relations of the engineer to employer, employees, customers, and public. Engineering code of ethics. Bridging between college and business. Practical training of engineering graduates. SHEPARDSON and Non-resident Lecturers.

EXPERIMENTAL ENGINEERING LABORATORIES

Professor FRANK B. ROWLEY, Director; Instructor BURTON J. ROBERTSON, Assistant Director.

Note.—The Experimental Engineering Laboratories furnish opportunity for the departments of the College of Engineering and Architecture to carry out experimental work in various branches of engineering. The administration of the Laboratories is under the general control of a committee of which the Dean of the College is chairman. The courses are planned by the heads of the departments concerned, subject to arrangement of practical details with Professor Rowley. Instructors from these departments conduct the courses, working under the laboratory organization, and in the Experimental Engineering Building.

COURSES

No.	Title	Credits	Required of	Prereq. courses
C. E. 52	Highways and Pavements....		Jr. C. E.	C. E. 12
C. E. 237-238	Structural Laboratory.....			C. E. 133
C. E. 243-244	Cement and Concrete Laboratory			C. E. 143
C. E. 251	Highway Laboratory.....			C. E. 51, 52
C. E. 261	Water and Sewage Purification			C. E. 162
C. E. 263	Hydraulic Laboratory.....			C. E. 164
M. & M. 141	Materials-Testing Laboratory.	1	Jr.	With M. M. 134
M. & M. 143	Hydraulics Laboratory.....	1	Jr.	With M. M. 136
M. & M. 144	Materials-Testing Laboratory.	1½	Jr. E. M. & Met. E.	
M. E. 81	Elementary M. E. Laboratory	2	Jr. M. E.	Reg. in 42 or equiv.
M. E. 82	Elementary Steam Laboratory	2	Jr. M. E.	M. E. 81
M. E. 83	Elementary Power Laboratory	2	Jr. M. E.	M. E. 82
M. E. 84	Elementary Laboratory (General)	1½	Jr. E. M. & Met. E.	
M. E. 181	Advanced Laboratory (General)	1½	Sr. E. M. & Met. E.	
M. E. 182	Advanced Steam Laboratory.	2	Sr. M. E.	M. E. 151
M. E. 183	Power and Gas Engine Laboratory	2	Sr. M. E.	Reg. in 150
M. E. 184	Advanced Engineering Laboratory	2	Sr. M. E.	M. E. 182, 183
M. E. 287	Engineering Research.....	9-3	P.-Sr. M. E.	
M. E. 288	Engineering Research.....	9-3	P.-Sr. M. E.	
M. E. 289	Engineering Research.....	9-3	P.-Sr. M. E.	

C.E. 52. HIGHWAYS AND PAVEMENTS. Continuation of Course 51, with laboratory practice. LANG.

C.E. 237-238. STRUCTURAL LABORATORY. Similar to 243, but dealing mainly with experimental problems in structural steel. Strain gauge study of actual stress distribution in beams, columns, and riveted joints. LAGAARD, MANEY.

C.E. 243-244. CEMENT AND CONCRETE LABORATORY. Laboratory technic and experimental investigation of special problems in cement, concrete, and reinforced concrete. LAGAARD.

C.E. 251. HIGHWAY LABORATORY. Investigations in coöperation with State Highway Department. LANG.

C.E. 261. WATER AND SEWAGE PURIFICATION. Continuation of Course 163. Design of water purification and sewage disposal. BASS.

C.E. 263. HYDRAULIC LABORATORY. Study of special hydraulic problems in laboratory, drafting-room, and field. ———

M.&M. 141. MATERIALS-TESTING LABORATORY. Investigation of the physical properties of various metals and engineering materials (wood, cement, ropes, etc.). Standard methods of testing. BROOKE, HOLMAN, NEWKIRK, PRIESTER.

M.&M. 143. HYDRAULIC LABORATORY. Experimental and demonstrational work. Pressure head, Piezometer tubes, gages, stability of flotation, Bernouilli's theorem. Venturi meter, flow through orifices, over weirs, and through pipes. Open channels, gaging, impact on vanes, pumps, and hydraulic machines. BROOKE, HOLMAN, NEWKIRK, PRIESTER.

M.&M. 144. MATERIALS-TESTING LABORATORY. Investigation of physical properties of metals and engineering materials: wood, cement, ropes, etc., supplemented by lectures and materials of construction and methods of testing. Mining and Metallurgical Engineers. BROOKE, HOLMAN.

M.E. 81. ELEMENTARY MECHANICAL LABORATORY. Calibration of gages, Pitot tubes, indicator springs. Study of steam calorimeters, indicator cards, valve-setting. Tests of hoists and gears; power pumps and mechanical appliances; viscosity and specific gravity of oils. SHOOP, HIRLEMAN.

M.E. 82. STEAM LABORATORY. Tests of steam engines, injectors, ejectors, steam separators, steam and power pumps, boilers. SHOOP, HIRLEMAN.

M.E. 83. ELEMENTARY POWER LABORATORY. Calibration of dynamometers, measurement of power required to drive machinery; calibration of water meters, Venturi tube. ROWLEY.

M.E. 84. ELEMENTARY GENERAL LABORATORY. Calibration of thermometers, gages, weirs, nozzle orifices, and meters. Efficiency of machines, friction of belting, friction tests; burning point, chill point, viscosity and specific gravity of oils. Tests of water motor, rams, and pulsometers. SHOOP.

M.E. 181. ADVANCED GENERAL LABORATORY. Indicator practice, valve-setting, separating and throttling calorimeters, tests of steam engines, gas engines, pumps, air compressors, blowers, turbines, boilers, and power plant. ROWLEY, SHOOP.

M.E. 182. ADVANCED STEAM LABORATORY. Tests of steam turbines, flow of steam through nozzles and pipes. Tests of compound and triple expansion engines, condensers, superheaters, and boilers. SHOOP.

M.E. 183. POWER AND GAS ENGINE LABORATORY. Tests of gas, gasoline, and hot-air engines, gas producers. Power and lighting plants. ROWLEY, ROBERTSON.

M.E. 184. ADVANCED ENGINEERING LABORATORY. Opportunity will be offered for carrying on investigations in connection with tests of complete power plants, refrigerators, air compressors, bowers, and fans. Also automobile testing and gas-engine investigations. ROWLEY, SHOOP.

EXPERIMENTAL LABORATORY 1. Calibration of gages, pyrometers, meters, weirs, orifices; indicator practice; valve setting; steam calorimeters, separators and traps; efficiency of pipe covering; tests of steam engines.

EXPERIMENTAL LABORATORY 2. Efficiency tests of Corliss engine, boiler, pumps, injectors, turbines, air compressors, fans, gas engines and producers. Complete power-plant test.

M.E. 287-288-289. ENGINEERING RESEARCH. Courses may be elected which involve investigations in connection with concrete, structural materials, hydraulics, steam and gas engines, heating and ventilating. Reports, special problems, and related tests. FLATHER, ROWLEY, HOLMAN, SHOOP.

GEOLOGY AND MINERALOGY

Professor WILLIAM H. EMMONS; Assistant Professor GEORGE M. SCHWARTZ.

COURSES

No.	Title	Credits	Required of	Prereq. courses
2	General Geology.....	3	Elective soph. C. E.	None
15	Applied Geology.....	3	Elective	2

2. GENERAL GEOLOGY. Materials of the earth and geologic processes. Application of geology to engineering problems. Lectures, rock study, and field excursions. SCHWARTZ.

15. APPLIED GEOLOGY FOR CIVIL ENGINEERS. Occurrence, properties, production, and uses of building stones, cements, clay, fuels, and road metals. A brief introduction to the study of ore deposits and historical geology. SCHWARTZ.

HYGIENE AND FIRST AID

Professor JOHN SUNDWALL; Associate Professor LOUIS J. COOKE.

COURSES

No.	Title	Credits	Required of	Prereq. courses
1	Hygiene and First Aid to the Sick and Injured.....	0	Fr.	None

1. HYGIENE AND FIRST AID TO THE SICK AND INJURED. Lectures, demonstrations and recitations. Promotion of health. Sources, routes, and prevention of communicable diseases. One hour per week during the winter quarter. SUNDWALL, COOKE.

MATHEMATICS AND MECHANICS

Professor WILLIAM E. BROOKE; Associate Professors WILLIAM F. HOLMAN, BURT L. NEWKIRK; Assistant Professors HANS H. DALAKER, CARL A. HERRICK, GEORGE C. PRIESTER; Instructors CHARLES BOEHNLEIN, EDWIN E. CLARK, JOHN J. CRAIG, OLIVER C. EDWARDS, JOHN G. FRAYNE, RAYMOND R. HERRMANN, WILLIAM M. MCCLINTOCK, RODERICK W. SILER; H. B. WILCOX.

COURSES

No.	Title	Credits	Required of	Prereq. courses
9	H.-S. Higher Algebra (3 hrs.)	0	Fr. who lack h.-s.	credit in it
10	Solid Geometry (3 hrs.).....	0	Fr. who lack h.-s.	credit in it
11	Applied Mathematics and Mechanics	5	Fr.	Higher alg. and solid geometry
12	Applied Mathematics and Mechanics	5	Fr.	11
13	Applied Mathematics and Mechanics	5	Fr.	12
21	Applied Mathematics and Mechanics	5	Soph.	13
22	Applied Mathematics and Mechanics	5	Soph.	21
23	Applied Mathematics and Mechanics	5	Soph.	22
131	Technical Mechanics.....	3	Jr.	23
132	Technical Mechanics.....	3	Jr.	131
133	Technical Mechanics.....	2	Jr.	132
134	Strength of Materials.....	2	Jr.	with 131
135	Strength of Materials.....	3	Jr.	134
136	Hydraulics	3	Jr.	132
141	Materials-Testing Laboratory..	1	Jr.	with 134
143	Hydraulics Laboratory.....	1	Jr.	with 136
144	Materials-Testing Laboratory..	1½	Jr. E. M. & Met. E.	
145	Strength of Materials.....	4	Jr. Chem.	
137	Hydraulics	1	Sr. Chem.	
138	Hydraulics	1	Sr. Chem.	137
91	Calculus for Architects.....	4	Soph. Arch.	13
92	Mechanics for Architects.....	4	Soph. Arch.	91
93	Strength of Materials for Architects	4	Soph. Arch.	92
151	Differential Equations.....	3	Elective	23
152	Advanced Calculus.....	3	Elective	151
153	Advanced Calculus.....	3	Elective	152
161	Advanced Technical Mechanics	3	Elective	133
162	Advanced Technical Mechanics	3	Elective	161
163	Advanced Technical Mechanics	3	Elective	162
171	Math. Theory of Elasticity...	3	Elective	135
172	Math. Theory of Elasticity...	3	Elective	171
173	Math. Theory of Elasticity...	3	Elective	172
146	Materials of Engineering.....	3	Elective	135

9. HIGHER ALGEBRA. (High School.) Fundamental rules, fractions, linear simultaneous equations, graphs, theory of exponents, surds, complex quantities, quadratic equations, numerical exercises, slide rule. BOEHNLEIN, CLARK, CRAIG, FRAYNE, MCCLINTOCK, WILCOX.

10. SOLID GEOMETRY. (High School.) Lines and planes in space, dihedral and polyhedral angles, polyhedrons, cylinders, cones, similarity, prismoid formula, sphere, areas, volumes, numerical exercises in areas, volumes, weights, slide rule. BOEHNLEIN, CLARK, CRAIG, FRAYNE, MCCLINTOCK, WILCOX.

11. APPLIED MATHEMATICS AND MECHANICS. Theory of quadratic equations, interpretation of complex results, graphical representation, indeterminate equations, ratio, proportion, variation, progressions, series, undetermined coefficients, binomial theorem, logarithms, theory of equations, derivatives, Horner's method. Sturm's theorem. BOEHNLEIN, CLARK, CRAIG, FRAYNE, MCCLINTOCK, SILER, WILCOX.

12. APPLIED MATHEMATICS AND MECHANICS. Trigonometry and elementary applied mechanics with laboratory. BOEHLEIN, CLARK, CRAIG, EDWARDS, FRAYNE, HERRMANN, MCCLINTOCK, SILER.

13. APPLIED MATHEMATICS AND MECHANICS. Analytic geometry and elementary applied mechanics with laboratory. BOEHNLEIN, CLARK, CRAIG, EDWARDS, FRAYNE, HERRMANN, MCCLINTOCK, SILER.

21. APPLIED MATHEMATICS AND MECHANICS. Calculus and applied mechanics. BROOKE, HOLMAN, NEWKIRK, DALAKER, HERRICK, PRIESTER, HERRMANN, SILER.

22. APPLIED MATHEMATICS AND MECHANICS. Calculus and applied mechanics. BROOKE, HOLMAN, NEWKIRK, DALAKER, HERRICK, PRIESTER, HERRMANN, SILER.

23. APPLIED MATHEMATICS AND MECHANICS. Calculus and applied mechanics. BROOKE, HOLMAN, NEWKIRK, DALAKER, HERRICK, PRIESTER, HERRMANN, SILER.

131. TECHNICAL MECHANICS. Statics. Resolution of forces, moments, conditions of equilibrium, free-body method, caternary. NEWKIRK, DALAKER, HERRICK, PRIESTER.

132. TECHNICAL MECHANICS. Center of gravity, moment of inertia, stresses in framed structures and machines, dynamics of a particle, Newton's laws of motion, kinematics of circular, harmonic, and curvilinear motion in general. NEWKIRK, DALAKER, HERRICK, PRIESTER.

133. TECHNICAL MECHANICS. Theorems of work and energy, impulse and momentum, d'Alembert's principle. Elementary dynamics of rigid bodies. NEWKIRK, DALAKER, HERRICK, PRIESTER.

134. STRENGTH OF MATERIALS. Mechanical and elastic properties of materials of construction, beams, shafts, columns. BROOKE, HOLMAN, NEWKIRK, PRIESTER.

135. STRENGTH OF MATERIALS. Continuation of 134. Combined stresses, dynamic stresses, hollow cylinders and spheres, roller, plates, curved bars, springs, true stresses, theory of internal stress. BROOKE, HOLMAN, NEWKIRK, PRIESTER.

136. HYDRAULICS. Laws of equilibrium of fluids, flow through orifices and over weirs, pressure and flow through tubes and pipes, flow in conduits and rivers, dynamic pressure of water, elementary principles of turbines and pumps. BROOKE, HOLMAN, NEWKIRK, PRIESTER.

141. MATERIALS-TESTING LABORATORY. Investigation of the physical properties of various metals and engineering materials (wood, cement, ropes, etc.). Standard methods of testing. BROOKE, HOLMAN, NEWKIRK, PRIESTER.

143. HYDRAULIC LABORATORY. Experimental and demonstrational work. Pressure head, Piezometer tubes, gages, stability of flotation, Bernouilli's theorem. Venturi meter, flow through orifices, over weirs and through pipes. Open channels, gaging, impact on vanes, pumps, and hydraulic machines. BROOKE, HOLMAN, NEWKIRK, PRIESTER.

146. MATERIALS OF ENGINEERING. Origin, manufacture, properties, treatment, and use of iron, steel, copper, aluminum, zinc, lead, iron, ferrous alloys, timber, stone, burnt clay products, cementing materials, rubber and leather, as used in engineering practice. Testing, specification and inspection of engineering materials. PRIESTER.

151. DIFFERENTIAL EQUATIONS. Differential equations and their solutions. First order and first degree, first order and higher degree, singular solutions, total differential equations, linear differential equations, miscellaneous methods, system of simultaneous equations, integration in series. Partial differential equations. BROOKE, DALAKER.

151-153. ADVANCED CALCULUS WITH APPLICATIONS. Text, Wilson's *Advanced Calculus*. BROOKE, DALAKER.

161-162-163. ADVANCED TECHNICAL MECHANICS. Special problems in the dynamics of machinery; vibrations, balancing, whirling shafts, rapidly rotating disks, dynamical stability, gyroscope. BROOKE, NEWKIRK.

171-172-173. MATHEMATICAL THEORY OF ELASTICITY. BROOKE, NEWKIRK.

91. CALCULUS. (Course in Architecture.) A short course. Derivatives, maxima and minima, integration of simple forms, definite integrals, areas. HOLMAN, DALAKER.

92. MECHANICS. (Course in Architecture.) Statics, resolution of forces, conditions of equilibrium, center of gravity, moment of inertia of plane sections, stresses in framed structures. HOLMAN, DALAKER.

93. STRENGTH OF MATERIALS. (Course in Architecture.) Mechanical and elastic properties of materials of construction, design of riveted joints, beam theory, columns, arches. HOLMAN, DALAKER.

137-138. HYDRAULICS, WITH LABORATORY. (Short course for Chemical Engineers.) BROOKE, HOLMAN, NEWKIRK, PRIESTER.

144. MATERIALS-TESTING LABORATORY. Investigation of the physical properties of metals and engineering materials: wood, cement, ropes, etc., supplemented by lectures and materials of construction and methods of testing. (Mining and Metallurgical Engineers.) BROOKE, HOLMAN.

145. STRENGTH OF MATERIALS. (Course for Chemical Engineers.) Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, dynamic stresses, hollow cylinders and spheres, roller, plates, curved bars, springs true stresses, theory of internal stress. BROOKE, HOLMAN, NEWKIRK, PRIESTER.

MECHANICAL ENGINEERING

Professors JOHN J. FLATHER, FRANK B. ROWLEY; Associate Professors JOHN V. MARTENIS, S. CARL SHIPLEY, CHARLES F. SHOOP; Instructors WILLIAM E. BRYANT, RALPH R. GRIFFITH, CLARK W. HIRLEMAN, EDWARD P. QUIGLEY, PAUL W. RHAME, WILLIAM H. RICHARDS; Assistants HARRY MARTINSON, CARL PETERSON, FRED TEAL, JOHN A. WIDING.

COURSES

No.	Title	Credits	Required of	Prereq. courses
	Elementary Shop Practice...	2	Fr. engrs.	
11	Woodworking	Each	course is repeated	every quarter
12	Foundry			
13	Forge			
14	Machine Shop Practice.....	4	Soph. M.E.	
15	Machine Shop Practice.....	4	Soph. M. E.	14
16	Machine Shop.....	2	Soph. E. E.	
210	Tool Design.....	3	P.-Sr. M.E. option	15
211	Tool Construction.....	3	P.-Sr. M. E. option	
21	Mechanical Technology.....	1	Soph. M. E.	
18	Industrial Education.....	3	Sch. of Ed.	
223	Industrial Management.....	3	P.-Sr. M. E.	15 and sr.
224	Industrial Management Lab..	3	P.-Sr. M. E. option	223
225	Industrial Management Problems	3	P.-Sr. M. E. option	223
226	Safety Engineering.....	2	P.-Sr. M. E. option	15; 223
31	Elementary Machine Design..	2	Soph. M. E.	Draw. 7
32	Mechanism	4	Jr. M. E.	31
33	Mechanism and Kinematics..	3	Jr. E. E.	Draw. 7
34	Kinematics and Machine Design	4	Jr. M. E.	32
35	Machine Design.....	3	Jr. M. E.	34
37	Machine Design.....	3-4	Jr. E. E.	33
231	Advanced Engineering Design	3	Sr. M. E.	
232	Advanced Engineering Design	3	Sr. M. E.	
233	Advanced Engineering Design	3	Sr. M. E.	
235	Steam-Engine Design.....	3	Sr. M. E. option	42 or equiv.
236	Gas-Engine Design.....	3	Sr. M. E. option	150
237	Gas-Tractor Design.....	3	Sr. M. E. option	236

No.	Title	Credits	Required of	Prereq. courses
41	Automotives	2	Soph. M. E.	
42	Steam Engines	3	Jr. M. E.	Soph. math.
43	Steam Engines and Boilers	3	Jr. M. E.	42
144	Heat Engines	3	Sr. E. E.	
145	Heat Engines	3	Sr. E. E.	
146	Heat Engines	3	Sr. E. E.	
147	Heat Engines	4	Sr. Ch. E.	
148	Heat Engines	4	Sr. Ch. E.	
149	Heat Engines	4	Sr. C. E.	
150	Gas Engines and Producers	3	Sr. M. E.	41 and 43
151	Thermodynamics	3	Sr. M. E.	Jr. math.
152	Steam Turbines	3	Sr. M. E. option	152
153	Heating and Ventilation	4	Sr. M. E. option	
154	Heating and Ventilation (Arch.)	2–3	Sr. Arch.	
255	Advanced Heating and Ventilation	3	P.-sr. M. E. option	153
256	Comp. Air and Refrig. Machinery	3	Sr. M. E. option	151
257	Mech. Equipment of Buildings	3	P.-sr. M. E. option	
61	Measurement of Power	2	Jr. M. E.	Reg. in M. & M. 133
262	Power Engineering	3	P.-sr. M. E. option	43 or equiv.
263	Power-Plant Management	3	Sr. & P.-sr. M.E. option	43 or equiv.
264	Power-Plant Management	3	P.-sr. M. E. option	43 or equiv.
265	Power-Plant Management	3	P.-sr. M. E. option	43 or equiv.
266	Power-Plant Design	3	P.-sr. M. E. option	43 or equiv. and 35
267	Power-Plant Design	3	P.-sr. M. E. option	43 or equiv. and 35
271	Railway Technology	1	P.-sr. M. E. option	
272	Railway Design and Loco. Cons	4	P.-sr. M. E. option	
273	Railway Design and Loco. Cons	4	P.-sr. M. E. option	
274	Railway Design and Loco. Cons	4	P.-sr. M. E. option	
278	Locomotive Road Tests	3	P.-sr. M. E. option	
81	Elementary M. E. Laboratory	2	Jr. M. E.	Reg. in 42 or equiv.
82	Elementary Steam Laboratory	2	Jr. M. E.	81
83	Elementary Power Laboratory	2	Jr. M. E.	82
84	Elementary Laboratory (General)	1½	Jr. E. M. & Met. E.	
181	Advanced Laboratory (General)	1½	Sr. E. M. & Met. E.	
182	Advanced Steam Laboratory	2	Sr. M. E.	151
183	Power and Gas-Engine Lab.	2	Sr. M. E.	Reg. in 150
184	Advanced Engineering Lab.	2	Sr. M. E.	182, 183
287	Engineering Research	9–3	P.-sr. M. E.	
288	Engineering Research	9–3	P.-sr. M. E.	
289	Engineering Research	9–3	P.-sr. M. E.	
193	Engineering Practice	2	Sr. M. E.	

No.	Title	Credits	Required of	Prereq. courses
90, 91, 92	Seminar	1	Jr. M. E. option	
190, 191, 192	Seminar	1	Sr. M. E.	
290, 291, 292	Seminar	1	P.-sr. M. E. option	
293	Aeronautical Engineering	3	P.-sr. M. E. option	
294	Aeroplane Design	3	P.-sr. M. E. option	
295	Contracts and Specifications	3	P.-sr. M. E.	193
296	Thesis		P.-sr. M. E.	287

11-12-13. ELEMENTARY SHOP PRACTICE. A general course in shop practice, which includes pattern-making, foundry and forge work. Each course is given every nine weeks. SHIPLEY, BRYANT, GRIFFITH, QUIGLEY, RICHARDS.

14. MACHINE SHOP PRACTICE. Machine operations. Manufacturing methods. Also heat treatment of steel, autogenous welding, welding and brazing. Shop practice, lectures, and recitations. SHIPLEY, GRIFFITH, QUIGLEY, RHAME, and Assistants.

15. MACHINE SHOP PRACTICE. Continuation of Course 14.

16. MACHINE SHOP PRACTICE. Course 15 condensed for students in electrical engineering.

210. TOOL DESIGN. Design of tools for manufacturing interchangeable parts; jigs and milling fixtures. SHIPLEY.

211. TOOL CONSTRUCTION. Construction of tools, jigs, and fixtures for manufacturing interchangeable parts. SHIPLEY, GRIFFITH.

21. MECHANICAL TECHNOLOGY. Study of mechanical processes involved in various manufacturing industries and in the development and utilization of power. Lectures by various specialists.

18. INDUSTRIAL EDUCATION. Special course in shop work including sloyd. For teachers in College of Education. RICHARDS.

223. INDUSTRIAL MANAGEMENT. Shop and factory organization and management; cost and wage systems. Depreciation of equipment. Machine burden. Time studies. FLATHER.

224. INDUSTRIAL MANAGEMENT LABORATORY. An advanced course in shop practice with especial reference to production. Time studies; stores and follow-up systems. Investigations in local factories. Lectures, assigned reading, practice, and reports. FLATHER, SHIPLEY.

225. INDUSTRIAL MANAGEMENT PROBLEMS. Special investigations of practical problems and suggested methods of procedure. Lectures, assigned reading, and reports. FLATHER.

226. SAFETY ENGINEERING. A study of the methods employed to promote safety in the factory; fire hazards, fire protection; automatic sprinkler apparatus; workmen's compensation laws. SHIPLEY.

31. ELEMENTARY MACHINE DESIGN. Empirical proportion and design of machine parts; tracings; working drawings from sketches; drawing-room systems and conventional methods. Taken in conjunction with the work of the post-graduates in engineering design. SHIPLEY, RHAME.

32. MECHANISM. Transmission of motion. Levers, gearing, linkwork, belts, screws, epicyclic trains, parallel motions, quick-return movements. Graphical determination of paths, speeds, accelerations of important mechanisms; centroids, analysis of mechanisms; cams; kinematic pairs, machine parts. MARTENIS.

33. MECHANISM AND KINEMATICS. The transmission of motion without consideration of the strength of parts. Levers, gearing linkwork, kinematic pairs; machine parts, construction of tooth profiles. Paths and velocities of mechanisms. A short course arranged for electrical engineers. MARTENIS.

34. KINEMATICS AND MACHINE DESIGN. Construction of tooth profiles, roulettes; study of gearing. Calculation and design of machine parts; riveted and screwed joints; rotating pieces, bearings. Gearing: spur, bevel and spiral. MARTENIS.

35. MACHINE DESIGN. Calculation and design of pulleys, fly-wheels, belt- and rope-driving; study and design of valves, D-slide, piston, double ported, riding cut-off, Corliss; Stephenson link, Walschaert gear. FLATHER, MARTENIS, HIRLEMAN.

37. MACHINE DESIGN. Calculation and design of such machine parts as fastenings, bearings, rotating pieces, pulleys and belting, spur gearing, bevel gears, spiral gears, and rope-driving. Recitations, lectures, drawing room practice. Arranged for students in electrical engineering. FLATHER, MARTENIS, HIRLEMAN.

231-232-233. ADVANCED ENGINEERING DESIGN. Original design, including machinery for changing size and form, cranes, pumping, transmission machinery, and engineering appliances. Lectures, problems, and drawing-room practice. FLATHER, ———

235. STEAM-ENGINE DESIGN. Calculations and working drawings for a high-speed automatic or Corliss steam engine. Theoretical diagrams, inertia forces; determination of details. FLATHER, ———

236. GAS-ENGINE DESIGN. Calculations and working drawings of a gas motor for heavy-duty tractor, truck, marine, or other service. Theoretical diagrams and details of parts. ROWLEY.

237. GAS-TRACTOR DESIGN. Selection of wheel sizes; horsepower weight and drawbar pull. Bearing pressures; ratios and strength of gearing. Details of principal parts. ———

41. AUTOMOTIVES. A study of mechanical problems involved in automobiles, trucks and tractors, starting and ignition devices, carburetors, lubrication, cooling and transmissions. SHIPLEY.

42. STEAM ENGINES. The steam engine, including elementary thermodynamics. Types and details. Mechanics of the steam engine, steam distribution, reciprocating parts, indicator cards. Valve gears, Zeuner diagram; governors. Compound engines. Elementary study of steam turbines. Taken in connection with Course 81. FLATHER, ———

43. STEAM ENGINES AND BOILERS. Continuation of the preceding course, together with an elementary study of condensers and air pumps, also steam boilers and stokers. Smoke prevention. To be taken in connection with 82. FLATHER, ———

144. HEAT ENGINES. Elementary thermodynamics. Properties of steam; types and details of steam engines; valve gears; governors; compound engines. Condensers and air pumps. SHOOP, HIRLEMAN.

145. HEAT ENGINES. Continuation of Course 144. Combustion and fuels; boilers, smoke prevention. Selection of engines and boilers. SHOOP, HIRLEMAN.

146. HEAT ENGINES. Elementary study of steam turbines and gas engines. Courses 144, 145, 146 are arranged for students in electrical engineering and are accompanied by three hours' work in laboratory each week. SHOOP, HIRLEMAN.

147-148. HEAT ENGINES. Courses 144, 145, and 146 condensed for students in chemical engineering including four hours' laboratory per week. SHOOP.

149. HEAT ENGINES. A brief course for students in civil engineering accompanied by four hours laboratory per week. SHOOP, HIRLEMAN.

150. GAS ENGINES AND PRODUCERS. Laws of gases; gas cycles. Otto, semi-Diesel, and Diesel engines. Mechanism of various types. Carburetion, governing, cooling, lubrication. Principles of design. Gas producers; types, suction, pressure, blast, furnace. By-products recovery. ROWLEY.

151. THERMODYNAMICS. The mechanical theory of heat as applied to steam, oil, gas, and hot-air engines and allied power-plant machinery and accessory equipment, including compressors, injectors, reheaters, and refrigerating apparatus. SHOOP.

152. STEAM TURBINES. Theory and practice applied to various types. Thermodynamics and mechanical analysis of problems involved in the design of nozzles, blades, rotors, bearings, and governors. Condition of operation; systems of transmission; lubrication; economy; field of service. SHOOP.

153. HEATING AND VENTILATING. Principles of heating and ventilation. Construction and operation of heating apparatus. Furnaces, steam, hot-water, vapor, vacuum, and fan systems of heating; ventilation. Lectures, recitations, and designs. MARTENIS.

154. HEATING AND VENTILATING. Same course as 153 with the omission of design problems. Arranged for students in architecture.

255. ADVANCED HEATING AND VENTILATING. An advanced course for post-seniors. To be taken in connection with research work in the laboratory, Course 287. ROWLEY.

256. COMPRESSED AIR AND REFRIGERATOR MACHINERY. (a) Air compressors and motors; power transmission by compressed air. (b) Principles of refrigeration. Various types of refrigerating machines, refrigerants, applications to ice-making, cold storage, cooling of air, liquids, and solids. Lectures and recitations. MARTENIS.

257. MECHANICAL EQUIPMENT OF BUILDINGS. Appliances used; heating, ventilating, plumbing systems; piping for fire protection, compressed air, gas, and vacuum cleaning; elevators. Choice of systems. Theory and practice of designing and detailing layouts. Equipment designs for various types of buildings. MARTENIS, ROWLEY.

61. MEASUREMENT OF POWER. Methods employed in measuring power. Dynamometers, friction brakes, railway dynamometer cars, ship dynamometers, power required to drive machine tools and shafting, selection of motors, calculation of circuits. Lectures, recitations, and drawing-room work. To be taken in conjunction with 83. FLATHER.

262. POWER ENGINEERING. Advanced study and application of engines, stokers, boilers; coal-handling equipment and accessories. Layout of manufacturing shops. Routing of work, transmission systems and selection of motors, factory lighting and heating. Lectures, recitations, drawing-room work. FLATHER.

263-264-265. POWER-PLANT MANAGEMENT. Operation and maintenance of boilers, engines, gas producers, gas engines, steam turbines, and accessory apparatus. Smoke prevention. Flue-gas analysis. Daily logs and power costs. FLATHER, HIRLEMAN.

266-267. POWER-PLANT DESIGN. Problems, designs, and estimates for power plants and central stations. Selection of motive powers, relative advantages of steam and producer-gas plants, choice of engines and boilers; pumps, shafting, piping, and accessories. FLATHER.

271. RAILWAY TECHNOLOGY. The practical details of construction of locomotives. A systematic course of visits to the various railroad shops in the vicinity. Lectures and recitations. ———

272-273-274. RAILWAY DESIGN AND LOCOMOTIVE CONSTRUCTION. Locomotive and car details; the locomotive boiler, linkages, and assembled parts. Construction of locomotives: frames, springs, equalizing arrangements, running gear, brakes, trucks, lubrication. Engine details; heat insulation, cylinder proportions. Lectures and assigned reading. ———.

278. LOCOMOTIVE ROAD TESTS. Tests on locomotives and trains. Dynamometer car and drawbar pull. FLATHER and Assistants.

81. ELEMENTARY MECHANICAL LABORATORY. Calibration of gages, Pitot tubes, indicator springs. Study of steam calorimeters, indicator cards, valve setting. Tests of hoists and gears; power pumps and mechanical appliances; viscosity and specific gravity of oils. SHOOP, HIRLEMAN.

82. STEAM LABORATORY. Tests of steam engines, injectors, ejectors, steam separators, steam and power pumps, boilers. SHOOP, HIRLEMAN.

83. ELEMENTARY POWER LABORATORY. Calibration of dynamometers, measurement of power required to drive machinery; calibration of water meters, Venturi tube. ROWLEY.

84. ELEMENTARY GENERAL LABORATORY. Calibration of thermometers, gages, weirs, nozzle orifices, and meters. Efficiency of machines, friction of belting, friction tests; burning point, chill point, viscosity and specific gravity of oils. Tests of water motor, rams, and pulsometers. SHOOP.

181. ADVANCED GENERAL LABORATORY. Indicator practice, valve-setting, separating and throttling calorimeters, tests of steam engines, gas engines, pumps, air compressors, blowers, turbines, boilers, and power plant. ROWLEY, SHOOP.

182. ADVANCED STEAM LABORATORY. Tests of steam turbines, flow of steam through nozzles and pipes. Tests of compound and triple expansion engines, condensers, superheaters, and boilers. SHOOP.

183. POWER AND GAS ENGINE LABORATORY. Tests of gas, gasoline, and hot-air engines, gas producers. Power and lighting plants. ROWLEY.

184. ADVANCED ENGINEERING LABORATORY. Opportunity will be offered for carrying on investigations in connection with tests of complete power plants, refrigerators, air compressors, blowers, and fans. Also automobile-testing and gas-engine investigations. ROWLEY, SHOOP.

287-288-289. ENGINEERING RESEARCH. Courses may be elected which involve investigations in connection with concrete, structural materials, hydraulics, steam and gas engines, heating and ventilating. Reports, special problems, and related tests. FLATHER, ROWLEY, HOLMAN, SHOOP.

193. ENGINEERING PRACTICE. Engineering relations, legal and ethical. Collaboration and consultation; technical reports, investigation and estimates. Professional employment, ownership of plans; patents and rights of invention. Day labor and contract systems of construction; public and private works, arbitration.

90-91-92. SEMINAR. Reading of assigned articles in current technical press. Preparation of synopsis and presentation of principal features. Arranged for juniors. MARTENIS.

190-191-192. SEMINAR. Same as Course 93. Arranged for seniors. FLATHER.

290-291-292. SEMINAR. Same as Course 93. Arranged for post-seniors. FLATHER.

293. AERONAUTICAL ENGINEERING. Design of aerial propellers, aeroplane engines. Application of theory of propellers and gasoline engines to aeroplanes. Includes calculations and drawings for high-speed multi-cylinder light-weight engine; balancing reciprocating parts; uniform torque; theoretical diagrams. ———

294. AEROPLANE DESIGN. Calculations and drawings for a given aeroplane; stability, strength, propulsion, and motive power required. ———

295. CONTRACTS AND SPECIFICATIONS. A study of engineering specifications. Classes of specifications; essential features; clauses; details. Bids and bidders, engineering contracts. Examples. Lectures, recitations, and practice in writing specifications. FLATHER.

296. THESIS. A thesis will be required of all post-seniors preliminary to graduation. This thesis must be chosen in consultation with the department and may consist of problems in design or experimental research.

METALLURGY

Professor WILLIAM R. APPLEBY; Associate Professor OSCAR E. HARDER; Instructor RALPH L. DOWDELL.

COURSES

No.	Title	Credits	Required of	Prereq. courses
156w	Metallography for Engineers.	3	Sr. M. E.	
157s	Adv. Metallog. for Engineers.	3	Sr. M. E.	156
163f	Advanced Metallography.....	To be ar	Elective	156, 157 or equiv.
164w	Advanced Metallography.....	To be ar	Elective	
165s	Advanced Metallography.....	To be ar	Elective	
201f	Adv. Metallography for Gr. Students	To be ar	Elective	
202w	Adv. Metallography for Gr. Students	To be ar	Elective	
203s	Adv. Metallography for Gr. Students	To be ar	Elective	

156w. METALLOGRAPHY FOR ENGINEERS. Principles of metallography, including pyrometry, thermal analysis, constitution diagrams, miscroscopic and photomicrographic technic; metallography and heat treatment of iron and steel. Laboratory work. HARDER, DOWDELL.

157s. ADVANCED METALLOGRAPHY FOR ENGINEERS. Continuation of 156. Metallography of alloy steels, tool steels, high-speed tool steels, and important non-ferrous alloys; metallography applied to engineering practice and specifications. Outside reading and special reports. Laboratory work. HARDER, DOWDELL.

163f-164w-165s. ADVANCED METALLOGRAPHY. Technical and scientific research. The study of steel rails, automobile and locomotive parts, tool steels, etc. Special problems in metallography with outside reading. Seminar work on the recent advance in metallography. HARDER.

201f-202w-203s. ADVANCED METALLOGRAPHY FOR GRADUATE STUDENTS. Intended primarily for research work. HARDER.

MILITARY SCIENCE AND TACTICS

Professor ALBERT G. GOODWYN, Captain, Infantry, U.S.A., Chairman; Assistant Professors BEN W. FIELD, Captain, Infantry, U.S.A.; LAURENCE T. WALKER, Captain, Coast Artillery Corps, U.S.A.; LEE R. WATROUS, JR., Captain, Coast Artillery Corps, U.S.A.; EDGAR B. MOOMAU, 1st Lieutenant, Infantry, U.S.A.; HARVEY G. THOMAS, 1st Lieutenant, U.S.A., Retired; Instructors JOEL R. BAKER, Master Signal Electrician, Signal Corps, U.S.A.; ALFRED BRANDT, Regimental Sergeant Major, Infantry, U.S.A.; HENRY W. BROWN, Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; KENNA B. CALDWELL, Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; AUBREY R. DUNKUM, 1st Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; WILLIAM FINKE, 1st Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; JOSEPH HAVLICEK, Regimental Commissary Sergeant, Infantry, U.S.A., Retired; WILLIAM L. HOGAN, 1st Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; INGVALD M. JOHNSON, 1st Sergeant, Infantry, Unassigned, U.S.A.; JOSEPH LEES, 1st Sergeant, Infantry, U.S.A., Retired; JOHN MCWILLIAMS, 1st Sergeant, Infantry, U.S.A., Retired; WILLIAM G. PALMS, Sergeant, Infantry, Unassigned, U.S.A.

COURSES

No.	Title	Credits	Required of	Prereq. courses
1-2-3	First-Year Basic Course R.O.T.C.	None	Fr.	None
4-5-6	Second-Year Basic Course R.O.T.C.	None	Soph.	1-2-3
51-52-53	First-Year Advanced Course R.O.T.C.	9‡	Jr. elective	4-5-6
54-55-56	Second-Year Advanced Course R.O.T.C.	9	Sr. elective	51-52-53

‡ Must be legally eligible for enrollment in Reserve Officers' Training Corps. Consult Commandant.

1-2-3. FIRST-YEAR BASIC COURSE R.O.T.C. Practical instruction in schools of the soldier, company, and battalion; signals, ceremonies, first aid.

4-5-6. SECOND-YEAR BASIC COURSE R.O.T.C. Practical and theoretical instruction in schools of the company and battalion; advance and rear guard drill; practical and theoretical instruction in guard duty. Gallery practice. Ceremonies. Infantry, coast artillery, and signal corps.

51-52-53. FIRST-YEAR ADVANCED COURSE R.O.T.C.

54-55-56. SECOND-YEAR COURSE R.O.T.C.

POLITICAL SCIENCE

Professors CEPHAS D. ALLIN, JEREMIAH S. YOUNG; Assistant Professor WILLIAM A. ANDERSON.

No.	Title	Credits	Required of	Prereq. courses
25-26	American Government.....	4	Elective	None
27	Business Law.....	2	Elective	26

25-26. AMERICAN GOVERNMENT. The origin, development, and actual workings of the national and state governments.

27. BUSINESS LAW. A course in Business Law arranged for Engineers including the law of contracts, suretyship, agency, partnership, corporations, negotiable instruments, conveyance patents, and riparian rights.

11. MUNICIPAL GOVERNMENT. A study of the organization and chief functions of American cities; their growth, relation to the state, forms of charters, inefficiency and corruption, reform measures; and the administration of finance, police, health, and other activities. ANDERSON.

PHYSICS

Professors HENRY A. ERIKSON, W. FRANCIS G. SWANN, JOHN T. TATE, ANTHONY ZELENY; Professorial Lecturer LOUALLEN F. MILLER; Instructors ARCHIE D. POWER, OSWALD ROGNLEY, JOSEPH VALASEK.

COURSES

No.	Title	Credits	Required of	Prereq. courses
	Required Courses			
3f	Elements of Mechanics and Sound	3	Soph. Arch. & Engrs.	Trig.
4f	Elements of Mech. Lab.....	1	Soph. Engrs.	3 or reg. in 3
23w	Heat	3	Soph. Arch. & Engrs.	3
24w	Heat Laboratory.....	1	Soph. Engrs.	4, 23 or reg. in 23
43s	Magnetism and Electricity....	3	Soph. Arch. & Engrs.	3
44s	Electrical Laboratory.....	1	Soph. Engrs.	4, 43 or reg. in 43

No.	Title	Credits	Required of	Prereq. courses
144f	Electrical Measurements.....	3	Jr. E. E.	43 and 44
	Electives			
122s	Pyrometry and Heat.....	3		23 and 24
241f-243w				
245s	Mathematical Theory of Electricity and Magnetism.....	9	Elective P.-sr. E. E.	
247f-248w-249s	Electron Theory.....	9	Elective P.-sr. E. E.	

3. ELEMENTS OF MECHANICS AND SOUND. Mechanics of solids, fluids, wave motion, and sound. A study of the simpler fundamental principles. First part of a general Course 3, 23, 43. Course 4 should be taken in conjunction with this course. Three lectures, one quiz hour a week. ERIKSON.

4. ELEMENTS OF MECHANICS AND SOUND LABORATORY. Measurements in the mechanics of solids, fluids, wave motion, and sound; the laboratory part supplementing Course 3. One two-hour session in the laboratory a week. ERIKSON.

23. HEAT. A study of the principles underlying heat phenomena. Course 24 should be taken in conjunction with this course. Three lectures, one quiz hour a week. MILLER.

24. HEAT LABORATORY. The laboratory part supplementing Course 23. One two-hour session in the laboratory a week. MILLER.

43. MAGNETISM AND ELECTRICITY. A study of the principles underlying magnetic and electric phenomena. Course 44 should be taken in conjunction with this course. Three lectures, one quiz hour a week. ZELENY.

44. ELECTRICAL LABORATORY. The laboratory part supplementing Course 43. One two-hour session in the laboratory a week. ZELENY.

144. ELECTRICAL MEASUREMENTS. Devoted mainly to the study of potentiometer methods, capacity, inductance, magnetic flux. Two three-hour laboratory periods a week. ZELENY.

For electives in Department of Physics see the bulletin of the College of Science, Literature, and the Arts.

RHETORIC AND PUBLIC SPEAKING

Professor JOSEPH M. THOMAS; Associate Professor FRANK M. RARIG; Instructors CECIL C. BEAN, WILLIAM P. DUNN, THOMAS R. MATHER, HARRY W. ROBBINS, HOWARD T. VIETS; Teaching Assistants TRACY PEYCKE, ALFRED SCHWEPPE.

COURSES

No.	Title	Credits	Required of	Prereq. courses
4-5-6	Rhetoric and Composition....	9	Fr. arch. & soph. eng.	None
31	Technical Writing.....	3	Elective	4-5-6
41-42-43	Public Speaking.....	9	Elective	4-5-6

4-5-6. RHETORIC AND COMPOSITION. Training in writing; study of the work of writers who have handled scientific subjects with clearness and power; outside reading. BEAN, DUNN, MATHER, ROBBINS, VIETS, PEYCKE, SCHWEPPE.

31. TECHNICAL WRITING. A quarter course in business letters, reports, etc., planned to meet the professional needs of engineering students. VIETS.

41-42-43. PUBLIC SPEAKING. A general course in public speaking. RARIG.

SUMMER READING

All engineering students are advised to take general courses in reading of a non-professional character during their college course. The purpose of this general reading is to increase the acquaintance of the student with literature, history, and general science; to develop in him a taste for good reading; and to impress him with the importance of such knowledge not only as a source of individual enjoyment but as a practical aid to engineers in their social and business relations.

A circular on general reading has been prepared and may be secured at the dean's office. This contains a list of books from which the student may make his own selection. The books have been chosen for their value in providing general training, but an attempt has been made to include only readable and attractive works. Most of the books in the list are available in standard low-priced editions, and each student is urged to purchase his own copy and thus add to the value and pleasure of the reading. A statement of the books read during the college year is required at the close of the year, and a statement of those read during the summer vacation is required at the beginning of the next college year. In addition the student may be asked to give the substance of the books read and his impressions concerning them. One credit will be allowed for each course satisfactorily completed.

The Bulletin *of the* University *of* Minnesota

The College of Agriculture, Forestry, and Home Economics

Announcement of Courses in Agriculture for the Year 1920-1921

Vol. XXIII No. 27 July 10 1920

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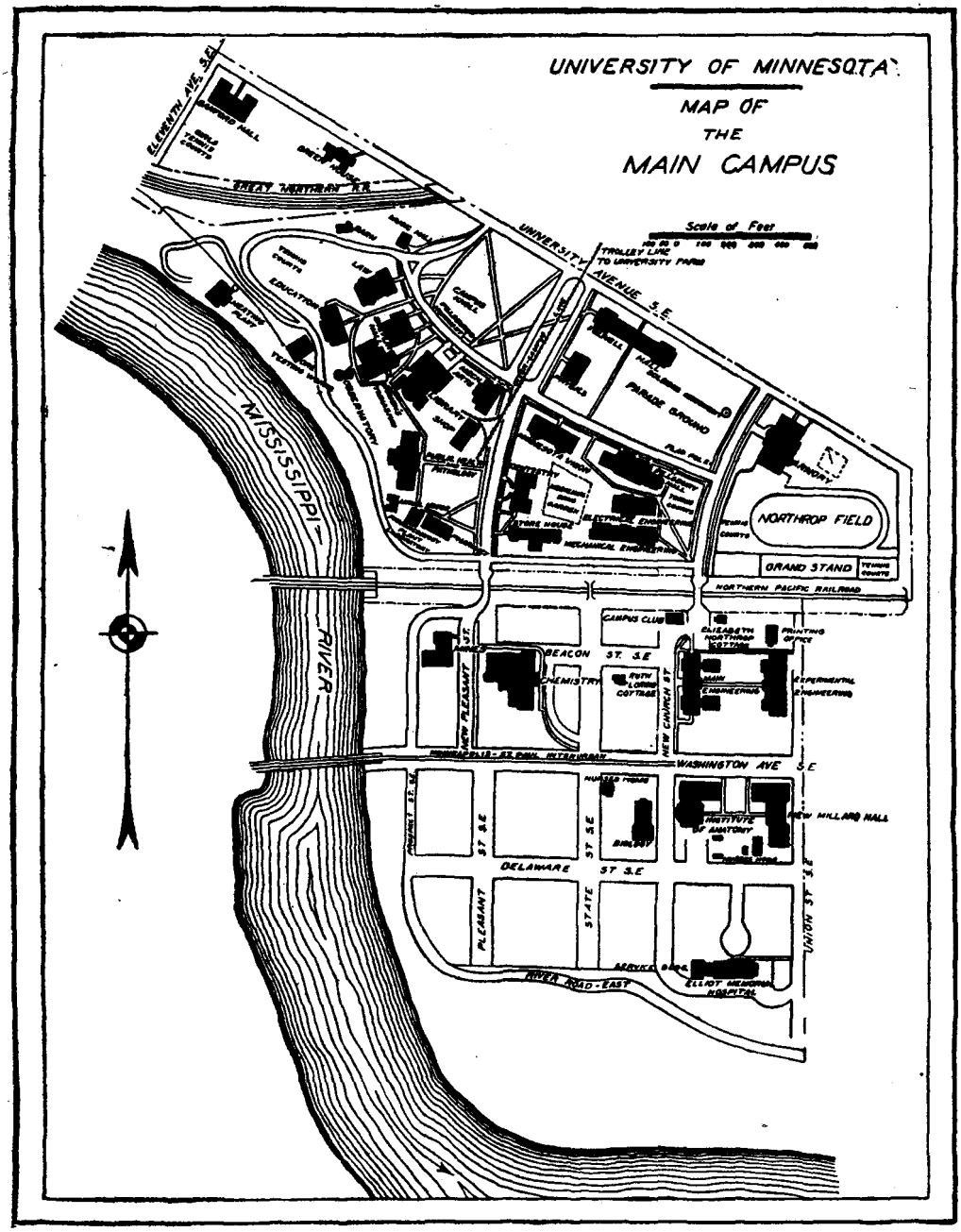
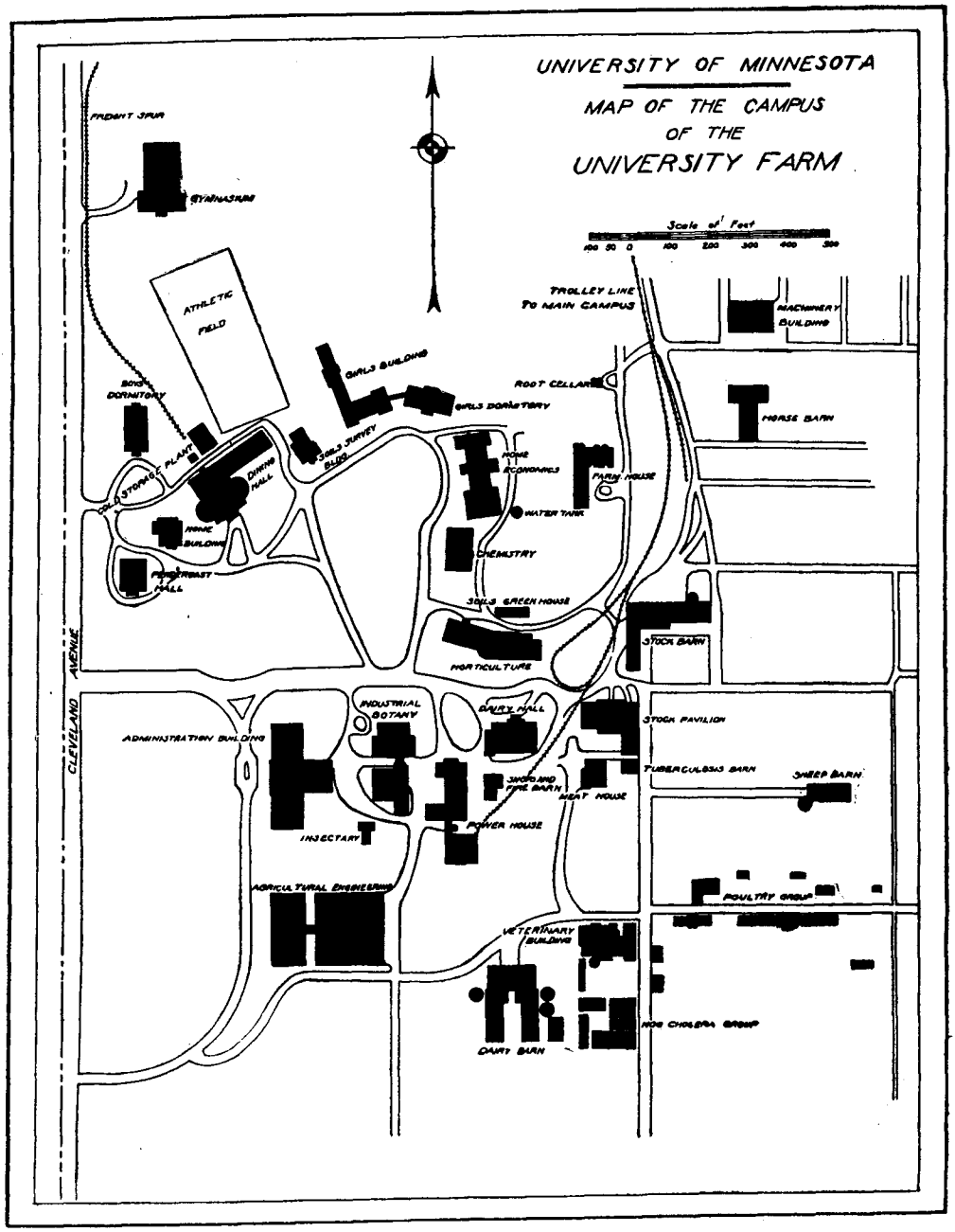


Area of Main Campus, 108.5 acres



Area of University Farm, 422.56 acres

1920

JULY

Su	Mo	Tu	W	Th	Fr	Sa
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4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
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AUGUST

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SEPTEMBER

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OCTOBER

Su	Mo	Tu	W	Th	Fr	Sa
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NOVEMBER

Su	Mo	Tu	W	Th	Fr	Sa
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DECEMBER

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1921

JANUARY

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FEBRUARY

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MARCH

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APRIL

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MAY

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JUNE

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JULY

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24	25	26	27	28	29	30
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AUGUST

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SEPTEMBER

Su	Mo	Tu	W	Th	Fr	Sa
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OCTOBER

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16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	..	..	..	..	..

NOVEMBER

Su	Mo	Tu	W	Th	Fr	Sa
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20	21	22	23	24	25	26
27	28	29	30	..	..	..
..	..	..	..	..	..	..

DECEMBER

Su	Mo	Tu	W	Th	Fr	Sa
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11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
..	..	..	..	..	..	..

CALENDAR

1920-1921

1920			
September	15	Wednesday	Registration closes except for new students
September	21-28	Week	Examinations for removal of winter and spring quarter conditions and entrance examinations Registration of new students. Payment of fees
September	29	Wednesday	Fall quarter begins, 8:15 a.m.
October	4	Monday	School of Agriculture, first term begins
October	15	Friday	Half holiday, annual freshman-sophomore contest
October	21	Thursday	Senate meeting, 4:30 p.m.
October	29	Friday	Last day for removal of spring quarter incompletes
November	2	Tuesday	Election Day; a holiday
November	15-27		Advanced Creamery Operators' Short Course
November December	15 1		Advanced Cheese-Makers' Short Course
November	25	Thursday	Thanksgiving Day; a holiday
November December	29 4	Week	Ice-Cream Makers' Short Course
December	6-11	Week	Milk Plant Operators' Short Course
December	16	Thursday	Senate meeting, 4:30 p.m.
December	21	Tuesday	Last day for winter quarter registration except for new students
December	22	Wednesday	Fall quarter closes, 5:20 p.m. School of Agriculture, first term closes Christmas vacation begins, 5:20 p.m.
December January	27 3	Week	Registration of new students. Payment of winter quarter fees
1921			
January	3-8	Week	Farmers' and Home-Makers' Week Short Course
January February	3 12		Beginning Creamery Operators' Short Course
January	3-8		Threshermen's Short Course
January	3-8		Traction Engineering Short Course
January	4	Tuesday	Winter quarter begins, 8:15 a.m.
January	10	Monday	School of Agriculture, second term begins

February	1	Tuesday	Last day for removal of fall quarter incompletes
February	12	Saturday	Lincoln's Birthday; a holiday
February	17	Thursday	Senate meeting, 4:30 p.m.
February	22	Tuesday	Washington's Birthday; a holiday
March	16	Wednesday	Last day for spring quarter registration except for new students
March	24	Thursday	Winter quarter closes, 5:20 p.m. Spring vacation begins
March	24-29	Week	Registration of new students. Payment of spring quarter fees
March	30	Wednesday	Spring quarter begins, 8:15 a.m. School of Agriculture, second term closes
April	4-9		Boys' and Girls' Week Short Course
April	27	Wednesday	Last day for removal of winter quarter incompletes
May	19	Thursday	Senate meeting, 4:30 p.m.
May	30	Monday	Memorial Day; a holiday
June	12	Sunday	Baccalaureate service
June	14	Tuesday	Spring quarter closes
June	15	Wednesday	Forty-ninth annual commencement
June	17-18		Summer session registration. Payment of fees
June	20	Monday	Summer session begins
July	30	Saturday	Summer session closes

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

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ARTHUR G. RUGGLES, M.A., Professor of Entomology
ARTHUR C. SMITH, B.S., Professor of Poultry Husbandry
ELVIN C. STAKMAN, Ph.D., Professor of Plant Pathology

[1] On leave of absence, 1920-21.

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HARVEY G. THOMAS, First Lieutenant, U.S.A., Assistant Professor of Military Science and Tactics
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NOLA TREAT, B.S., Assistant Professor of Institutional Management
ARTHUR G. TYLER, Assistant Professor of Farm Engineering
LAURENCE T. WALKER, Captain, U.S.A., Assistant Professor of Military Science and Tactics
FREDERICK L. WASHBURN, M.A., Professor of Entomology
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MARION WELLER, B.A., Associate Professor of Textiles and Clothing
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[1]GERTRUDE M. BAKER, Instructor in Physical Education for Women
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HENRY D. BARKER, M.S., Instructor in Plant Pathology
WILLIAM A. BILLINGS, D.V.M., Instructor in Bacteriology
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LIONEL CROCKER, B.A., Instructor in Rhetoric
LELAND L. DE FLON, B.S., Instructor in Forestry
J. GRANT DENT, Instructor in Farm Engineering
JEAN M. DORSEY, B.S. in H.E., Instructor in Foods Management
AUBREY R. DUNKUM, First Sergeant, Unassigned, U.S.A., Instructor in Military Science and Tactics
WILLIAM FINKE, First Sergeant, Unassigned, U.S.A., Instructor in Military Science and Tactics
HALLY J. FISHER, R.N., Instructor in Home Nursing

[1] On leave of absence 1920-21.

WILLIAM K. FOSTER, LL.M., Assistant Director of Gymnasium
PERCY C. GLIDDEN, Instructor in Physical Education for Men
VETTA GOLDSTEIN, Instructor in Drawing and Design
SAMUEL A. GRAHAM, M.F., Instructor in Entomology
THORWALD S. HANSEN, B.S., M.F., Instructor in Forestry
JOSEPH HAVLICEK, Regimental Commissary Sergeant, Retired, U.S.A., Instructor in Military Science and Tactics
EARL A. HEWITT, D.V.M., Instructor in Veterinary Medicine
WILLIAM L. HOGAN, First Sergeant, Unassigned, U.S.A., Instructor in Military Science and Tactics
MAURICE G. JACOBSON, Instructor in Farm Engineering
INGVALD N. JOHNSON, First Sergeant, Unassigned, U.S.A., Instructor in Military Science and Tactics
ALLEN D. JOHNSTON, Instructor in Blacksmithing
CORNELIA KENNEDY, M.S., Ph.D., Instructor in Agricultural Biochemistry
FRED A. KRANTZ, B.S., Instructor in Horticulture
VALERIA LADD, B.A., Instructor in Physical Education for Women
ALVIN H. LARSON, B.S. in Agr., Instructor in Agricultural Botany
JOSEPH LEES, First Sergeant, Retired, U.S.A., Instructor in Military Science and Tactics
RUTH M. LINDQUIST, B.S., Instructor in Foods Management
LOU LOMBARD, Instructor in Foods and Cookery
OLIVE B. MACCOMBER, Instructor in Textiles and Clothing
MABEL C. MCDOWELL, B.S., Instructor in Foods Management
PAUL R. MCMILLER, M.S., Instructor in Soils
JOHN MCWILLIAMS, First Sergeant, Retired, U.S.A., Instructor in Military Science and Tactics
D. C. MITCHELL, B.Sc. in C.E., Instructor in Physical Education for Men
RUTH MOHL, M.A., Instructor in Rhetoric
MARGARET K. MUMFORD, B.A., Instructor in Foods and Cookery
WILLIAM G. PALMS, Sergeant, Unassigned, U.S.A., Instructor in Military Science and Tactics
ABE PEPINSKY, Instructor in Violin and Director of Orchestra
ETHEL L. PHELPS, B.S., Instructor in Textiles and Clothing
GAIL F. PUTTICK, B.Sc. in Agr., Instructor in Plant Pathology
LENORE RICHARDS, B.A., Instructor in Institutional Management
CARL B. ROEMER, Instructor in Physical Education for Men
GERTRUDE B. SCHILL, B.A., Instructor in Physical Education for Women
PAUL F. SHARP, B.A., Instructor in Agricultural Biochemistry
FREDERICK H. STEINMETZ, B.S. in Agr., Instructor in Agronomy
LAVINIA STINSON, B.A., Instructor in Foods and Cookery
ALICE H. TOLG, M.D., Instructor in Physical Education for Women
GILBERT H. WIGGIN, B.S., Instructor in Forestry
CLINTON G. WORSHAM, B.S., Instructor in Farm Management
JOHN W. BUSHNELL, B.S. in Agr., Assistant in Horticulture
CHESTER DAHLE, Assistant in Dairy Husbandry

FRANK GILMAN, Assistant in Physical Education for Men
HARRY GOLDIE, Assistant in Physical Education for Men.
OTTO G. SCHAEFER, B.S. in Agr., Assistant in Dairy Husbandry
WILLIAM T. TAPLEY, B.S., Assistant in Horticulture

EXTENSION STAFF

ARCHIE D. WILSON, B.S. in Agr., Director
CLARENCE H. WELCH, Secretary, Agricultural Extension Division
MARGARET B. BAKER, Assistant State Leader, Boys' and Girls' Club Work
FRANK E. BALMER, B.S. in Agr., State Leader County Agricultural Agents
MARY L. BULL, Home Economics Specialist
WILLIAM L. CAVERT, M.S., Farm Management Specialist
NORTON E. CHAPMAN, M.A., Poultry Husbandry Specialist
FRANKLIN C. CLAPP, B.S., M.S., Assistant Farm Management Specialist
SPENCER B. CLELAND, B.S., Assistant State Leader County Agents
LUCY CORDINER, M.A., Home Economics Specialist
WILLIS J. CORWIN, B.S., Assistant State Leader County Agents
JAMES M. DREW, Assistant
THEODORE A. ERICKSON, B.A., State Leader Boys' and Girls' Club Work
FRANK FROLIK, B.S., Plant Pathology Specialist
LEWIS H. FUDGE, B.S. in Agr., Assistant State Leader Boys' and Girls' Club Work
ROY H. GIBERSON, Assistant State Leader Boys' and Girls' Club Work
GEORGE F. HOWARD, Assistant State Leader Boys' and Girls' Club Work
J. SENECA JONES, B.S., Assistant State Leader County Agents
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ARTHUR J. MCGUIRE, B.Agr., Reclamation and Livestock Specialist
ADELE KOCH, M.A., Assistant State Leader in Home Economics
WILLIAM A. MCKERROW, Livestock Specialist
ROGER S. MACKINTOSH, B.Agr., M.S. in Agr., Horticultural Specialist
JOSEPH F. MONTGOMERY, B.S. in Agr., Livestock Specialist
WILLIAM E. MORRIS, Assistant State Leader County Agents
GEORGE H. NESOM, B.A., B.S., Soil Specialist
JULIA NEWTON, B.A., State Leader in Home Economics
RETT E. OLMSTEAD, B.D., Farmers' Club Specialist
JUNIATA L. SHEPPARD, M.A., Home Economics Specialist
EDWIN C. TORREY, Specialist in Publicity Work
LESLIE V. WILSON, B.S., Dairy Specialist

MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION IN THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

FRANCIS B. BARTON, Docteur de l'Université de Paris, Assistant Professor of Romance Languages
ROY G. BLAKEY, Ph.D., Professor of Economics

[1]Thomas M. Broderick, Ph.D., Assistant Professor of Geology and Mineralogy
Luther L. Bernard, Ph.D., Associate Professor of Sociology
Oscar C. Burkhard, Ph.D., Assistant Professor of German
Frederic K. Butters, Ph.D., Associate Professor of Botany
Royal N. Chapman, Ph.D., Assistant Professor of Animal Biology
William S. Cooper, Ph.D., Assistant Professor of Botany
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James Davies, Ph.D., Assistant Professor of German
Hermione L. Dealey, Ph.D., Assistant Professor of Educational Psychology
Z. Clark Dickinson, Ph.D., Assistant Professor of Economics
Hal Downey, Ph.D., Professor of Animal Biology
George W. Dowrie, Ph.D., Professor of Economics
Elias J. Durand, D.Sc., Professor of Botany
Richard M. Elliott, Ph.D., Associate Professor of Psychology
Manuel C. Elmer, Ph.D., Associate Professor of Sociology
William H. Emmons, Ph.D., Professor of Geology
Henry A. Erikson, Ph.D., Professor of Physics
Donald N. Ferguson, B.A., Assistant Professor of Pianoforte
Mabel R. Fernald, Ph.D., Assistant Professor of Psychology
Ross L. Finney, Ph.D., Assistant Professor of Sociology
William S. Foster, Ph.D., Associate Professor of Psychology
Jules T. Frelin, B.A., Assistant Professor of Romance Languages
Frederick B. Garver, Ph.D., Associate Professor of Economics
Isaac W. Geiger, Ph.D., Assistant Professor of Chemistry
N. S. Brien Gras, Ph.D., Professor of Economic History
John H. Gray, Ph.D., Professor of Economics
Frank F. Grout, Ph.D., Professor of Geology and Mineralogy
Melvin E. Haggerty, Ph.D., Professor of Educational Psychology
Alvin H. Hansen, Ph.D., Associate Professor of Economics
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Pedro Henríquez Ureña, Abogado, Ph.D., Assistant Professor of Romance Languages
Clarence L. Holmes, M.A., Assistant Professor of Economics
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Ned L. Huff, M.A., Assistant Professor of Botany
William H. Hunter, Ph.D., Associate Professor of Chemistry
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Lee I. Knight, Ph.D., Professor of Botany
Alfred E. Koenig, M.A., Dr. Theol., Assistant Professor of German
Samuel Kroesch, Ph.D., Assistant Professor of German
Winford P. Larson, M.D., Professor of Bacteriology and Immunology
Karl S. Lashley, Ph.D., Assistant Professor of Psychology
Albert J. Lobb, Ph.B., LL.B., Assistant Professor of Political Science
Elmer J. Lund, Ph.D., Associate Professor of Zoology

[1] On leave of absence 1920-21.
[2] Resigned July 1, 1920.

FRANK H. MACDOUGALL, Ph.D., Associate Professor of Chemistry
WILFORD S. MILLER, Ph.D., Associate Professor of Education
JOHN J. B. MORGAN, Ph.D., Assistant Professor of Psychology
BRUCE D. MUDGETT, B.A., Associate Professor of Economics
WALTER R. MYERS, Ph.D., Assistant Professor of German
HENRY F. NACHTRIEB, B.S., Professor of Animal Biology
HOWARD S. NOBLE, B.A., M.B.A., Assistant Professor of Accounting
OSCAR W. OESTLUND, Ph.D., Assistant Professor of Animal Biology
EVERETT W. OLMSTED, Ph.D., Litt.D., Professor of Romance Languages
RUTH S. PHELPS, M.A., Associate Professor of Romance Languages
CHESSLEY J. POSEY, M.S., Assistant Professor of Geography
THOMAS S. ROBERTS, M.D., Professor of Ornithology
C. OTTO ROSENDAHL, Ph.D., Professor of Botany
THOMAS H. SANDERS, M. of Commerce, Assistant Professor of Economics
CARL SCHLENKER, B.A., Professor of German
CARLYLE M. SCOTT, Professor of Music
COLBERT SEARLES, Ph.D., Professor of Romance Languages
CHARLES F. SIDENER, B.S., Professor of Chemistry
CHARLES P. SIGERFOOS, Ph.D., Professor of Zoology
EDWARD H. SIRICH, Ph.D., Assistant Professor of Romance Languages
J. WARREN STEHMAN, M.A., Assistant Professor of Economics
FLETCHER H. SWIFT, Ph.D., Professor of Education
JOSEPHINE E. TILDEN, M.S., Professor of Botany
[1]ARTHUR J. TODD, Ph.D., Professor of Sociology
MARVIN J. VAN WAGENEN, Ph.D., Assistant Professor of Educational Psychology
[1]HERBERT WOODROW, Ph.D., Associate Professor of Psychology
ANTHONY ZELENY, Ph.D., Professor of Physics
FRANK J. BRUNO, B.A., B.D., Professorial Lecturer in Sociology and Social Work
J. FRANKLIN EBERSOLE, Ph.B., Professorial Lecturer in Economics
ANTONIO HERAS, Bachiller, Licenciado en Derecho, Professorial Lecturer in Romance Languages
LOUALLEN F. MILLER, M.A., Professorial Lecturer in Physics
JEAN H. ALEXANDER, M.A., Instructor in Education
HILDING E. ANDERSON, B.A., Instructor in Economics
ANNE BENTON, B.A., Instructor in Bacteriology
LOUIS A. BOETTIGER, M.A., Instructor in Sociology
JOSEPH E. CUMMINGS, M.A., Instructor in Economics
SOLOMON M. DELSON, Ph.B., Instructor in Romance Languages
LYNWOOD G. DOWNS, M.A., Instructor in German
CHARLES B. DRAKE, M.A., Instructor in Romance Languages
MARGUERITE GUINOTTE, Brevet Supérieur, Certificat d'Aptitude Pédagogique, Instructor in Romance Languages
RICHARD JENTE, Ph.D., Instructor in German
ARTHUR M. JOHNSON, Ph.D., Instructor in Botany

[1] On leave of absence 1920-21.

CHARLES E. LIVELY, M.A., Instructor in Sociology
FRANCES E. LOWELL, Ph.D., Instructor in Psychology
PAUL L. MILLER, M.A., Instructor in Agricultural Economics
FRANCES M. MOREHOUSE, M.A., Instructor in Education
VICTOR H. PELZ, M.S., Instructor in Economics
GERTRUDE REEVES, Instructor in Pianoforte
ADOLPH RINGOEN, Ph.D., Instructor in Animal Biology
GEORGE M. SCHWARTZ, M.A., Instructor in Geology
ARTHUR J. TIEJE, Ph.D., Instructor in Geology
JOSEPH VALASEK, B.S., Instructor in Physics
GUSTAVE VAN ROOSBROECK, M.A., Instructor in Romance Languages
SAMUEL VASCONCELOS, B.A., LL.B., Abogado, Instructor in Romance Languages
GUY H. WOOLLETT, Ph.D., Instructor in Chemistry
PAUL T. YOUNG, Ph.D., Instructor in Psychology
ROBERT G. GREEN, B.A., Assistant in Bacteriology and Immunology
ANDREW N. WRAY, Teaching Fellow in Sociology

FACULTY COMMITTEES

1920-1921

Executive.—The Executive Committee of the Department of Agriculture
Enrollment.—WEST, BIESTER, MORROW, PIERCE, WENTLING
Curriculum.—FREEMAN, BIESTER, BOSS, CHEYNEY, FITCH, RILEY, STORM, WEIGLEY, WELLER, WEST
Students' Work.—FREEMAN, CHEYNEY, Mrs. LADD, NICHOLSON, WEIGLEY, WEST
Student Organizations.—LANSING, DUTCHER, FREEMAN, MORSE, WELLER
Farm Experience.—BOSS, ALDERMAN, ECKLES
Faculty Business.—GORTNER, RUGGLES, STAKMAN, PHELPS

GENERAL INFORMATION

ADMISSION

New students are admitted at the opening of any quarter.

All students entering for the first time must submit their credentials to the Enrollment Committee.

Admission is either by certificate or by examination. Candidates must have completed the equivalent of a four-year high-school course and must present:

1. Four units of English; or three units of English and four units of a foreign language; or three units of English and two units in each of two foreign languages.
2. One unit of elementary algebra and one unit of plane geometry.
3. Enough additional work to make in all fifteen units, of which not more than four may be in subjects not listed in the admission groups in the general information bulletin.

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised work offered in the school course, one additional school year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

For details of admission requirements and definition of "unit," see the bulletin of general information.

Every prospective student is urged to obtain before entering college at least six months' practical experience on a farm. Entering students whose farm experience credentials are not satisfactory will be examined as to their familiarity with farm practices, and farm experience will be required during the college course in accordance with the results of these examinations. For students who major in dairy husbandry at least three of the six months of approved farm experience must be on an accredited dairy farm.

Applicants for admission are urged to present physics (1 unit), chemistry (1 unit), and higher algebra (½ unit), for entrance credits. If these subjects are not completed in the high school, they will have to be taken in the University, thus postponing some of the vocational courses.

FEES

Free tuition.—The state will pay the tuition of any student who served in the army, navy, or marine corps of the United States during any war in which the United States has been involved, including members of the national guard or who, upon the call of the president, performed military service outside the borders of Minnesota in any trouble with Mexico; and of any student who performed overseas service as a regularly enlisted full-time worker of the Red Cross, engaged in nursing the sick or assisting in the care of soldiers in any government hospital, field or camp, which service has been officially recognized by the national government. The

amount of this free tuition is not to exceed $200 for any one person and the benefits of this act will not extend beyond July 1, 1924. The amount to be paid in any year will be limited by the legislative appropriation for that year.

Any amount applied for as bonus under the State Bonus Law is deducted from the $200 available for tuition.

Application for this free tuition should be made to the secretary's office at the time of registration. This applies only to students, who at the time of enlistment were citizens and residents of the state of Minnesota.

Tuition includes all of the regular quarter charges listed below except the deposit and penalty fees for change of registration, late registration, condition examinations, etc.

Tuition fee (per quarter)	
Residents of Minnesota	$20.00
Non-residents	30.00
Deposit (first quarter only)	5.00
Health fee (per quarter)	2.00
Minnesota Union (per quarter)	.70
Post-office box (per quarter)	.20
Special fees	
Examination for removal of conditions	1.00
Examinations for credit (after the first quarter in residence)	5.00
Special examinations	5.00
Change of registration	2.50

Late registration.—Old students must indicate their registration not later than two weeks before the day set for classes to begin. All students must complete their registration (including payment of fees) before the day set for classes to begin. Penalty for delay in either indicating or completing registration is five dollars. An additional dollar is charged for each day of delay after the last day set for the completion of registration and a similar charge is made for each day of delay after the last day set for payment of fees.

Important.—The regulations require that no student be allowed to register after the quarter opens except by special committee action.

FACULTY REGULATIONS

Students are held responsible for compliance with all faculty regulations. These regulations are published in a booklet issued to students at the time of registration.

REQUIREMENTS FOR GRADUATION AND DEGREES

After the completion of the prescribed course of study, including all of the required work and the requisite amount of elective work equivalent to a total of 204 (210, in June, 1921) credit hours, candidates will be recommended for graduation with the degree of Bachelor of Science.

CANDIDATES FOR THE TEACHER'S CERTIFICATE IN AGRICULTURE AND HOME ECONOMICS

Candidates for the teacher's certificate during the year 1920-21 will remain registered in the College of Agriculture, Forestry, and Home Economics.

The University desires, by encouraging the entrance of men and women into the profession of teaching, to emphasize the building up of a professional teaching spirit in its student body. Beginning with the year 1921-22 the University teacher's certificate will be granted only to graduates of the College of Education. Graduates of the College of Agriculture, Forestry, and Home Economics who have complied with the state requirements as to educational subjects may apply to the State Department of Education for special certificates (or first-grade certificates if the candidate has had one year of successful teaching experience) in agriculture and home economics. This method of obtaining certificates wi'l be available only as long as the State Department of Education feels that such certificates must be issued to meet the emergency in education and to comply with existing laws.

COURSE OF STUDY IN AGRICULTURE

The course of study is made up of 204* credit hours of work including:

1. Required courses, 105 to 128 credit hours, which every student must complete. These constitute approximately half of the curriculum and are considered as fundamental to any course in agriculture. In most cases these will be completed in the freshman and sophomore years.

2. Elective courses, 76 to 99 credit hours, distributed as follows:
   a. A major of from 24 to 36 credit hours.
   b. A minor of 18 credit hours.
   c. Limited electives amounting to 50 per cent of the remaining number of credit hours, which must be selected outside of the groups from which the major and minor have been chosen, and
   d. Free electives, sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University.

The major and minor must be selected from different elective groups, except that students whose major is chosen from group 4 (see page 20), Agricultural Sciences and Plant Industry, may select their minor from a different field of work in the same group.

EXPLANATION OF TERMS AND COURSE NUMBERS

The quarters in which courses are offered are indicated by the letters f (fall), w (winter), s (spring), and su (summer) following the course number. For example: 5f,w,s indicates that Course 5 is given in the fall quarter and is repeated in the winter and again in the spring quarter; 5f-6w indicates a two-quarter course extending through the fall and winter quarters; and 5f,w-6w,s, indicates that Course 5-6 is given in the fall and winter quarters and repeated through the winter and spring quarters.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200.

Numbers following the descriptive name of a course indicate the number of credit hours.

Course numbers in parentheses, following the number of credit hours, indicate prerequisite courses.

Descriptions of the courses listed in the following outline of the curricula, together with those of additional courses offered as electives, will be found on pages 23 to 76. The divisional statements are arranged alphabetically according to the names of the divisions.

* Students graduating in June, 1921 will be required to complete 210 credit hours, and those graduating in June, 1922, 207 credit hours, for their degrees.

One *credit hour* is equivalent to (1) one lecture or recitation period requiring two hours of preparation, (2) two periods of laboratory work requiring one hour of preparation, or (3) three periods of laboratory work with no preparation, each week for one quarter.

A major is a series of courses equivalent to from 24 to 36 credit hours chosen from one of the elective groups.

A *minor* is a series of courses equivalent to 18 credit hours chosen from one of the elective groups.

A *required* course is a course required of all students for graduation, irrespective of their major sequence.

A *limited elective* course is an elective which may not be chosen from the same group as the major or minor.

A *free elective* course may be chosen from any courses offered in the University for which the student has completed the prerequisites.

REQUIRED COURSES

All of the following work is required of every student except for the exemptions indicated. For some students this represents more than the regular amount of work of 17 credit hours per quarter. In such cases those subjects listed below which can not be taken in the freshman and sophomore years must take precedence the following year. Registration for from 15 to 18 credit hours of work each quarter will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.

Freshman lectures. A course of nine lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter. Must be taken in the freshman year.

Military drill. Three hours per week throughout the freshman and sophomore years. Students found to be physically unfit may be required to substitute special corrective exercises in gymnasium.

Physical Education 3w. Gymnasium and Swimming. Two hours per week for one quarter. Must be taken in the freshman year.

2. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed. Ordinarily, if botany is registered for in the freshman year, registration for zoology should be postponed until the sophomore year, and vice versa.

Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10 (Chem. 1-2-3 or 9-10)

Agron. 1f,w,s,su, Farm Crops, 3 (Soils 2)

An. Biol. 1f,w,s-2w,s,su, General Zoology, 10.

An. Husb. 1f,w, Types and Breeds of Livestock, 5.

Bact. 1f,w,s,su, Elementary Bacteriology, 5 (Chem. 1-2-3 or 9-10 Biol. 1 yr.)

Bot. 1f,s-2w,f, General Botany, 10. Students entering college with a year of high-school botany satisfactory to the department may omit Bot. 1 (see footnote on page 38) and substitute 5 credits elective later in their course of study.

Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high-school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than 10 credits.

Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. Those required to take Chem. 1-2-3 are exempt.

Dy. Husb. 1f,w,s, Elements of Dairying, 5.
Econ. 5f,w, General Economics, 5. Not open to freshmen.
Econ. 6f,w,s, Agricultural Economics, 3 (Econ. 5)
Farm Eng. 3f,s, Mechanical Drawing, 3.
Farm Eng. 8f,w, Farm Engineering, 5.
Farm Eng. 11f,w, Applied Mathematics, 5. Students presenting a half-year of high-school higher algebra may omit this course and substitute 5 credits elective later in their course of study.
Farm Eng. 21f-22w, Agricultural Physics, 10. Those presenting a year of high-school physics may omit this course and substitute 10 credits elective later in their course of study.
For. 26f,w, Tree Crops, 1. Should be taken in freshman year parallel with Soils 2.
Hort. 90f,s, General Horticulture, 3 (Soils 2)
Phys. Educ. 1f,w,s, Personal Hygiene, 1.
Pol. Sci. 1f, American Government, 5 (Not open to freshmen)
Rhet. 1f,w,s, [1]Rhetoric I, 3.
Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)
Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)
Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.
Rhet. 11f,w,s, Argumentation, 5 (Rhet. 3)
Rhet. 22f,w,s, Public Speaking, 5 (Rhet. 3)
Soils 2f,w, Elementary Soils, 2.
Soils 3s, Soils, 3 (Chem. 1-2-3 or 9-10, Soils 1)

ELECTIVE GROUPS

A. Groups from which major, minor, or electives may be chosen.

1. Agricultural Economics and Farm Management, including
   - Agricultural Economics
   - Farm Management
2. Agricultural Education and Agricultural Extension, including
   - Agricultural Education
   - Agricultural Extension
3. Animal Industry, including
   - Animal Husbandry
   - Dairy Husbandry
   - Poultry Husbandry
   - Veterinary Medicine
4. Agricultural Sciences and Plant Industry, including
   - Agricultural Biochemistry
   - Agronomy
   - Entomology and Economic Zoology
   - Horticulture
   - Plant Pathology and Botany
   - Soils

B. Group from which minor or electives may be chosen

1. Farm Engineering, including
   - Farm Engineering
   - Agron. 3, Farm Machinery

C. Groups from which electives only may be chosen

1. Bee Culture
2. Forestry
3. Home Economics
4. Military Science and Tactics
5. Physical Education
6. Rural Publications and Journalism
7. Courses in departments of other schools and colleges of the University

[1] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 71.

ELECTIVES

Students should consult with their advisers with reference to their choice of limited and free electives.

In selecting electives, note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

Registration for courses as electives in other colleges of the University must be in conformity with regulations of the college offering the course.

Elective courses in the College of Science, Literature, and the Arts, are separated into Junior College courses, open to freshmen and sophomores, and Senior College courses, open to juniors and seniors. In addition to satisfying other prerequisites an average grade of C must be maintained for the first two years in order to register for a Senior College elective.

AGRICULTURE-BUSINESS COURSE

This course offers an opportunity for those who wish to prepare specifically for some branch of agricultural business, such as the marketing of farm products, farm finance, farm implements, farm real estate, country merchandising and the like. The first two years are practically prescribed and include introductory courses in agriculture, economics, and the fundamental sciences necessary for further work in agriculture. During the freshman and sophomore years, students will register in the College of Agriculture, Forestry, and Home Economics. The junior and senior years are offered in the School of Business. Approximately half of the last two years is elective and may include advanced courses in agriculture and economics.

FRESHMAN AND SOPHOMORE YEARS

The outline for these years is the same as for the course in Agriculture (see pages 19 to 20) except that the following courses are omitted:

Agr. Biochemistry 7f,w-8w,s, General Agricultural Biochemistry, 10
Bact. 1f,w,s,su, Elementary Bacteriology, 5
Farm Eng. 3f,s, Mechanical Drawing, 3
Farm Eng. 11f,w, Applied Mathematics, 5
Farm Eng. 21f-22w, Agricultural Physics, 10
Rhet. 11f,w,s, Argumentation, 5
Rhet. 22f,w,s, Public Speaking, 5
Soils 3, Soils, 3
Pol. Sci. 1f, American Government, 5

The following courses are added:

Econ. 20w-21s, Economic History and Geography of Agriculture, 10 (must be taken in the freshman year)

Econ. 25f-26w, Principles of Accounting, 8 (not open to freshmen)

Econ. 23w, Business Organization, 5 (Econ. 3-4, or 5, or 7. Not open to freshmen)

Econ. 13s, Agricultural Statistics, 5 (Econ. 3-4, or 5, or 7. Not open to freshmen)

Electives, 2 to be selected from the courses omitted from the first two years of the Agriculture course.

The courses dealing with agricultural business which are offered by the School of Business and the College of Agriculture during the last two years are arranged by the School of Business into two lines of specialization as follows:

General Course

JUNIOR YEAR

Fall Quarter

No.	Title	Credits
Econ. 143f-144w	Money and Banking	5
Econ. 18f	Problems in Agricultural Economics	3
Econ. 89f	Marketing of Agricultural Products	5
	Electives	1-4

Winter Quarter

Econ. 143f-144w	Money and Banking	5
Agron. 102w	Farm Management II	3
	Electives	5-9

Spring Quarter

Pol. Sci. 28s	Business Law	5
Econ. 150s	Farm Finance	3
Agron. 103s	Farm Management II	3
	Electives	3-6

SENIOR YEAR

Fall Quarter

Econ. 107f	Land Economics	5
	Electives	9-12

Winter Quarter

Econ. 46w	Economics of Agricultural Production	3
Econ. 73w	Railway Traffic and Rates	3
	Electives	8-11

Spring Quarter

Econ. 117s	Prices of Farm Products	3
	Electives	11-14

Recommended electives:

Advanced courses in technical agriculture

Econ. 85f-86w	Marketing of Manufactured Products	6
Econ. 88s	Advertising	3
Econ. 103f-104w	Value and Distribution	6
Econ. 109w	Economics of Consumption	3
Econ. 176f	Commercial Policies	3
Econ. 177w	Foreign Trade	3
Econ. 191f-192w	Public Finance	6
Econ. 54s	Corporation Finance	3
Econ. 146w	Investments	3

Marketing of Farm Products

JUNIOR YEAR

Fall Quarter

No.	Title	Credits
Econ. 89f	Marketing of Agricultural Products	5
Econ. 85f-86w	Marketing of Manufactured Products	3
Econ. 18f	Problems in Agricultural Economics	3
	Electives	4-7

Winter Quarter

Econ. 73w	Railway Traffic and Rates	3
Econ. 85f-86w	Marketing of Manufactured Products	3
	Electives	8-11

Spring Quarter

Econ. 88s	Advertising	3
Econ. 110s-111f	Practice Course in Marketing	1
	Electives	10-13

SENIOR YEAR

Fall Quarter

Econ. 143f-144w	Money and Banking	5
Econ. 110s-111f	Practice Course in Marketing	2
	Electives	8-12

Winter Quarter

Econ. 143f-144w	Money and Banking	5
Econ. 108w	Agricultural Marketing Problems	3
	Electives	6-9

Spring Quarter

Pol. Sci. 28s	Business Law	5
Econ. 117s	Prices of Farm Products	3
	Electives	6-9

Recommended electives:

Advanced courses in technical agriculture dealing with special products.

Econ. 54s	Corporation Finance	3
Econ. 150s	Farm Finance	3
Econ. 72f	Economics of Transportation	3
Econ. 145s	International Exchange	3
Econ. 177w	Foreign Trade	3
Econ. 176f	Commercial Policies	3
Econ. 107f	Land Economics	5
Econ. 116w	Economics of Agricultural Production	3
Geol. 37s	Economic Geography	3

DESCRIPTION OF COURSES

For explanation of course numbers and credits see page 18.

AGRICULTURAL BIOCHEMISTRY

Professors Ross A. Gortner, Clyde H. Bailey; Associate Professors R. Adams Dutcher, Leroy S. Palmer; Assistant Professors George E. Holm, Clarence A. Morrow, John J. Willaman; Instructors Cornelia Kennedy, Paul F. Sharp.

General statement.—This division offers two types of work, namely, courses in those phases of chemistry which have special application in agriculture or home economics for students whose major work is in other divisions; and courses designed to train chemists for research or instruction in the special field of agricultural biochemistry.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
2w	Quantitative Methods.....	5	Jr., sr.	Chem. 10. cred.
3f,w,su	Types of Carbon Compounds.	6	Soph., jr.,sr.	Chem. 10 cred.
7f,w-8w,s	General Agricultural Biochemistry	10	Soph., jr., sr.	Chem. 10 cred.
15f	Principles of Animal Nutrition	3	Jr., sr.	7-8
	Advanced Courses			
101f,su-102w,su	Agricultural Quantitative Analysis	6	Jr., sr.	7-8
103f,su[1]	Dairy Chemistry.....	5	Jr., sr.	7-8
106f	Chemical Technology of Agricultural Products.....	5	Sr.	101-102
108s,su[1]	Chemistry of Wheat and Wheat Products...	3	Jr., sr.	7-8
110s,su[1]	Flour Laboratory Methods..	5	Jr., sr.	101-102, or Chem. 131-132, parallel 108
111f,su-112w,su	Phytochemistry	6	Sr.	Biol. 10 cred., org. chem.
113f,su-114w,su	Biochemical Laboratory Methods	4	Sr.	Quant. anal., parallel 111-112
116f,w,s,su	Chemistry of "Vitamines" and Deficiency Diseases.....	3 or 5	Sr.	111-112, 113-114, or Physiol. 101-102, or 7-8 and 15
118f,w,s,su	Laboratory Problems in Biochemistry	3 or 5	Sr.	111-112, 113-114; or 103 or 110

[1] Offered in alternate summers, offered in 1921.

INTRODUCTORY COURSES

2w. QUANTITATIVE METHODS. A brief course in the principles of quantitative analysis, including a study of stoichiometric problems, practice in the use of the balance and in typical gravimetric and volumetric manipulations. WILLAMAN.

3f,w,su. TYPES OF CARBON COMPOUNDS. An elementary study of the different groups of carbon compounds, with special reference to their relationships and their occurrence in plant and animal materials used as food. MORROW.

7f,w-8w,s. GENERAL AGRICULTURAL BIOCHEMISTRY. A lecture and laboratory course involving a qualitative and quantitative study of the types of organic and inorganic compounds found in plants and animals and of the chemical changes involved in metabolism, growth, and maintenance. DUTCHER.

15f. PRINCIPLES OF ANIMAL NUTRITION. A course consisting of lectures, recitations, and collateral reading emphasizing the chemical and physiological principles underlying digestion, metabolism, utilization of feeds, maintenance, growth, fattening, milk production, vitamine hypothesis, and deficiency diseases. DUTCHER.

ADVANCED COURSES

101f,su-102w,su. AGRICULTURAL QUANTITATIVE ANALYSIS. The estimation of inorganic and organic constituents of biological products, the proximate analysis of foods and feeding stuffs, the use of the polariscope, immersion refractometer, colorimeter and nephelometer, viscosimeter, and other special apparatus. MORROW.

103f,su. DAIRY CHEMISTRY. Lectures, library, and laboratory work involving a study of the chemical composition of dairy products and the quantitative analysis of these products as practiced in control laboratories, together with qualitative examination for preservatives and adulterations. PALMER.

106f. CHEMICAL TECHNOLOGY OF AGRICULTURAL PRODUCTS. The composition of the principal products and by-products of agriculture and their utilization as raw material in various industries, and the methods of chemical control work in these industries. BAILEY.

108s,su.[1] CHEMISTRY OF WHEAT AND WHEAT PRODUCTS. A lecture course, with collateral library reference work, on the chemical technology of the production and milling of wheat and the conversion of its products into human food. BAILEY.

[1] Offered in alternate summers, offered in 1921.

110s,su.[1] FLOUR LABORATORY METHODS. A laboratory course in methods of analysis of wheat and its products; milling tests of wheat, baking and special tests of flour. Designed to train students for research and control work in the cereal industry. BAILEY.

111f,su-112w,su. PHYTOCHEMISTRY. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes, and pigments and their physico-chemical relations to the vital processes involved in growth and nutrition. MORROW.

113f,su-114w,su. BIOCHEMICAL LABORATORY METHODS. A laboratory course paralleling the lectures in 111, using recent methods for the investigation of biologically important compounds, with especial reference to the detection and estimation of such compounds in cells or tissues. MORROW, SHARP.

116f,w,s,su. THE CHEMISTRY OF "VITAMINES" AND DEFICIENCY DISEASES. Lectures, consultations, and library work on special nutritional problems accompanied by chemical and biological studies of food materials from the standpoint of their "vitamine" content. DUTCHER, KENNEDY.

118f,w,s,su. LABORATORY PROBLEMS IN BIOCHEMISTRY. Special laboratory work in the preparation and isolation of pure compounds which occur in living cells, the study of biochemical reactions, and special methods of identification or determination of biochemical products. GORTNER, BAILEY, DUTCHER, PALMER, HOLM, MORROW, WILLAMAN.

AGRICULTURAL ECONOMICS

See Economics (page 43).

AGRICULTURAL EDUCATION

Professors ASHLEY V. STORM, DEXTER D. MAYNE; Assistant Professors JOHN V. ANKENY, WILLIAM P. DYER, ALBERT M. FIELD; Extension Specialists THEODORE A. ERICKSON, GEORGE F. HOWARD.

AGRICULTURAL EXTENSION

Instructor SPENCER B. CLELAND.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
11f,s	Principles of Vocational Education	3	Jr., sr[2]	None
21f,w	Vocational Education	3	Jr., sr[2]	None
41f,w,s	Teaching I	2	Jr., sr[2 3]	11, 131
42f,w,s	Teaching II	3	Sr.[2 3]	41, 131, Agron. 121, 122, 123

[1] Offered in alternate summers, offered in 1921.

No.	Title	Credits	Offered to	Prerequisite courses
53f,su	Consolidated Rural Schools..	3	All[2]	None
54s,su	Rural Education and Community Life.....	3	All	None
63f-64w-65s	General Agriculture.....	9	All	None
	Advanced Courses			
74f,su[4]	Visual Presentation.....	2	Jr., sr	None
75w,s	Visual Presentation.....	3	Jr., sr.	None
121w	Teachers' Course Home and School Garden Supervision	2	Approval of division	
131w,s,su	Methods in Teaching High-School Agriculture.....	5	Jr.,[1] sr,[2]	11
132s,su[3]	Methods in Teaching High-School Agriculture.....	3	Jr., sr.	11
133f,w,s	Organization and Methods for Manual Training.....	3	Jr., sr.	11
151f,s	Organization and Management	5	Sr.,[2]	11, 12
161f-162w-163s	Fundamentals of Agriculture	9	Jr., sr.[2]	None
164w,su[4]	Fundamentals of Agriculture	3	Jr., sr.[2]	None
171f,w	Extension Work.....	3	Sr.	None
173f,w,s	History of Agriculture.....	3	Soph., jr., sr.	None
176s	Advanced Visual Presentation	3	Jr., sr.	175
181w	Agricultural Statistics and Graphic Representation....	3	Soph., jr., sr.	None
191f-192w-193s	Seminar in Agricultural Education	2-6	Sr.[2]	None

AGRICULTURAL EXTENSION

1s	Agricultural Extension.....	2-3	Jr., sr.	12 cred. farm mgt. and agr. econ., 15 cred. an. industry; 6 cred. agr. educ.
2su,f	Agricultural Extension Field Course	3-12	Jr., sr.	1, approval of Agr. Ext. Division. An approved position

[1] Open to juniors on approval of the chief of the division.

[2] Offered only to those preparing to teach.

[3] Students are admitted to this course only when recommended by the faculty of the group in which they are majoring and when accepted by the Division of Agricultural Education.

Students who are prepared may be required to do their teaching in manual training.

[4] Special reduced courses for consolidated-school principals.

INTRODUCTORY COURSES

11f,s. PRINCIPLES OF VOCATIONAL EDUCATION. The fundamental principles upon which education is based. Emphasis is placed on those phases which are most closely related to vocational education. DYER.

21f,w. VOCATIONAL EDUCATION. A short history of vocational education; present status in Europe and the United States; manual training, and home arts in an educational system; place of agriculture in the public schools with special reference to Minnesota. MAYNE.

41f,w,s. TEACHING I. An introductory course in teaching, including observation of class work, apprentice teaching, and special conference discussions of problems relating to teaching. Intended to initiate the student into the routine of classroom procedure. Professional readings. ANKENY, DYER, FIELD.

42f,w,s. TEACHING II. Preparation of lesson plans and actual teaching of classes under careful supervision in recitation and laboratory; criticism and discussion of plans, methods and results of students teaching. Review and discussion of assigned professional readings. ANKENY, DYER, FIELD.

53f,su. CONSOLIDATED RURAL SCHOOLS. Building arrangements, selection of teachers, equipment, transportation of pupils, health supervision, home project work, and other problems in organization and management of consolidated rural schools from the viewpoint of the special needs of rural life. DYER.

54s,su. RURAL EDUCATION AND COMMUNITY LIFE. Special attention given to features which are desirable in a rural community for educational, recreational, ethical, and esthetic purposes and the ways and means to organize the same about the school as a center. DYER.

63f-64w-65s. GENERAL AGRICULTURE. For students majoring in such fields of work as agricultural biochemistry, entomology, and economic zoology, plant pathology, and in other colleges. A series of units by division chiefs and other agricultural specialists. STORM, MAYNE.

74f,su. VISUAL PRESENTATION. To acquaint students with the various visual aids, their preparation, source and use in the teaching process. Actual laboratory practice is given in the preparation and operation of various mediums. ANKENY.

75w,s. VISUAL PRESENTATION. To prepare persons for presenting materials by means of slides, films, charts, etc. Students assisted in assembling materials for their own use and in acquiring skill and technique in preparation and operation of various mediums. ANKENY.

ADVANCED COURSES

121w. TEACHERS' COURSE HOME AND SCHOOL GARDENING. A lecture and laboratory course designed to give teachers the preparation necessary for the proper planning, management, supervision of home and school gardens. ANKENY, FIELD.

131w,s,su. METHODS IN TEACHING HIGH-SCHOOL AGRICULTURE. Fundamental elements of method in teaching as related to teaching agriculture in high school. Organizing subject-matter of daily work; selection and manipulation of devices. Classroom and laboratory method. Specific plans for teaching secondary agriculture. FIELD.

132s,su. METHODS IN TEACHING AGRICULTURE. Fundamentals of method in teaching agriculture in public schools. Selecting, organizing, and presenting subject-matter. Equipment, illustrative material, laboratory work, field trips. Special emphasis on the home project as a method in teaching agriculture. FIELD.

133f,w,s. ORGANIZATION AND METHODS FOR MANUAL TRAINING.

151f,s. ORGANIZATION AND MANAGEMENT. Organization and management of work in secondary schools, particularly of Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and coördination of work. STORM, DYER.

161f-162w-163s. FUNDAMENTALS OF AGRICULTURE. Essential for principals and superintendents of schools in which agriculture is taught, and valuable for students of other colleges whose time for agriculture is limited. Agricultural College experts will give work in their special fields. STORM.

164w,su. FUNDAMENTALS OF AGRICULTURE. Basic principles of agricultural science and the fundamental elements of practical agriculture. Special emphasis on concrete problems in soils, crops, and animal husbandry, as related to classroom instruction and to school and home projects. FIELD.

171f,w. EXTENSION WORK. Federal, state, and local extension aims, organization. Assembling and use of extension data and equipment. Development of extension methods especially as applied to the work in Minnesota. ———

173f,w,s. HISTORY OF AGRICULTURE. A history of agricultural progress with special reference to the greater movements and to sources from which modern agriculture has received its most valuable acquisitions. Comparisons of our own agriculture with that of other countries.

176s. ADVANCED VISUAL PRESENTATION. Continuation of 175. Further work in design and construction of charts and lantern slides. Special study of motion picture machines. Actual practice in effective use of visual aids in lecture and recitation. ANKENY.

181w. AGRICULTURAL STATISTICS AND GRAPHIC REPRESENTATION. Course teaches application of statistical methods to agriculture and different means of representing agricultural statistics graphically. Of value to all students to enable them to interpret, present, and use agricultural statistics and graphic representations. ———

191f-192w-193s. SEMINAR IN AGRICULTURAL EDUCATION. Critical studies of important problems in agricultural education; opportunity for individual investigation and research; review and interpretation of current educational literature. STORM, FIELD.

AGRICULTURAL EXTENSION

1s. AGRICULTURAL EXTENSION. History, financing, and methods of agricultural extension work. Administrative departments, specialists, county workers with special reference to Minnesota. Development and functions of the farm bureau. County programs and reports, office administration, demonstrations, organization work. CLELAND.

2su,f. AGRICULTURAL EXTENSION FIELD WORK. Actual field practice in extension work on part salary in addition to credits. Number admitted to course limited by positions available. Usually will cover summer quarter, may extend into fall quarter. CLELAND.

AGRONOMY AND FARM MANAGEMENT

Professors ANDREW BOSS, HERBERT K. HAYES, Associate Professors ALBERT C. ARNY, LOUIS B. BASSETT; Assistant Professors RALPH J. GARBER, FORREST W. MCGINNIS, GEORGE A. POND; Instructors FREDERICK H. STEINMETZ, CLINTON G. WORSHAM; Extension Specialists WILLIAM L. CAVERT, FRANKLIN C. CLAPP.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s,su	Farm Crops	3	All	Soils 2
11s	Farm Machinery	3	Jr., sr.	None
	Advanced Courses			
101s	Farm Management I	3	Jr., sr.	1, Econ. 6
102f,w,su	Farm Management II: Organization	3	Sr.	1, Econ. 6, An. Husb. 6 or 8, Soils 3
103w,s	Farm Management II: Operation	3	Sr.	102
104s	Farm Management III	3	Sr.	101, 102
121f	Cereal Crops	3	Jr., sr.	1, bot. 10 cred.
122w	Corn and Potato Crops	3	Jr., sr.	1, bot. 10 cred.
123s	Forage and Fiber Crops	3	Jr., sr.	1, bot. 10 cred.
131f	Principles of Genetics	3	Jr., sr.	Bot. 10 cred., an. biol. 10 cred.
132s,su	Farm Crops Plant-Breeding	3	Jr., sr.	131

INTRODUCTORY COURSES

1f,w,s,su. FARM CROPS. An elementary study of the important field crops of the United States with emphasis upon those of local importance; distribution, economic importance, agricultural classification, cultural methods, and principles of improvement. GARBER, MCGINNIS, STEINMETZ.

11s. FARM MACHINERY. Lectures and laboratory work covering classification, mechanical construction, adjustment, and operation of the different kinds of farm machinery. BASSETT.

ADVANCED COURSES

101s. FARM MANAGEMENT I. Farm records—a study of simple farm accounting and of the forms and methods employed in making cost of production studies, and farm management surveys. Practice given in the art of record-keeping and accounting. POND, WORSHAM.

102f,w,su. FARM MANAGEMENT II: ORGANIZATION. A course in which the business side of farming is emphasized. Special attention is given to farm organization and equipment. BOSS, POND.

103w,s. FARM MANAGEMENT II: OPERATION. Continuation of 102. Special attention is given to farm operation. BOSS, POND.

104s. FARM MANAGEMENT III. An advanced seminar course, including cost of production studies, farm business analyses, and farm practices. BOSS.

121f. CEREAL CROPS. An advanced study of the cereal crops. Structure, group classification, improvement, growing, and utilization. Brief score-card practice and a limited amount of placing on intrinsic value included. ARNY, MCGINNIS.

122w. CORN AND POTATO CROPS. A study of the corn and potato crops similar to that outlined for Course 121. ARNY, MCGINNIS.

123s. FORAGE AND FIBRE CROPS. A study of forage plants through assigned reading, laboratory and field work. Following the study of each crop some attention is given to score-card practice and comparative placing of representative samples. ARNY, MCGINNIS.

131f. PRINCIPLES OF GENETICS. Lectures and laboratory work designed to familiarize the student with the underlying principles of breeding. Heredity variation, biometry, and evolution are emphasized. Same as Hort. 109. HAYES, DORSEY.

132s,su. FARM CROPS PLANT-BREEDING. Applied genetics is emphasized. Methods of breeding each of the important agricultural and horticultural crops with special attention to experiment station investigations and to the methods used by plant breeders. HAYES, GARBER.

ANIMAL BIOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY F. NACHTRIEB, HAL DOWNEY, WILLIAM A. RILEY, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Associate Professor ELMER J. LUND; Assistant Professors ROYAL N. CHAPMAN, OSCAR W. OESTLUND; Instructor ADOLPH RINGOEN.

General statement.—Courses in this department are closely correlated with those offered by the Division of Entomology and Economic Zoology of the College of Agriculture, Forestry, and Home Economics. For courses of that division, see page 50.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s-2w,s,su	General Zoology	10[1]	All	None
9f-10w	Histology	10[1]	Soph., jr., sr.	1-2
11s	General Histology	5	All	1-2
17f-18w	General Physiology	10[1]	Soph., jr., sr.	15 cred. or 10 cred. and chem. or phys. 10 cred.
23s	Morphogenesis and Behavior of Organisms	5	All	15 cred. or 10 cred. and chem. or phys. 10 cred.
35s	General Embryology	5	All	1-2
37f-38w-39s	General Entomology	9[1]	Soph., jr., sr.	1-2
43s	Introductory Entomology	5	All	1-2
44f	Animal Parasites	5	Soph., jr., sr.	1-2
59s	General Ecology	5	All	1-2
	Advanced Courses			
107s	Protozoology	3	Jr., sr.	15 cred. incl. 1-2
109f-110w	General Physiology	10[1]	Jr., sr.	20 cred.
114w-115s	Ornithology	6[1]	Jr., sr.	1-2
117f-118w-119s	Ecology of Insects	9[1]	Jr., sr.	43
124su	Advanced Ecology	5	Jr., sr.	117-118-119
125f-126w-127s	Advanced Entomology	9[1]	Jr., sr.	37-38-39 or 43
130w	Biology and Taxonomy of the Aphididae	3	Jr., sr.	20 cred. incl. 1-2
139s-140w	Histology and Development of Insects	6[1]	Jr., sr.	37-38-39 or 43
144f-145w-146s	Animal Parasites and Parasitism	9	Jr., sr.	1-2
181f-182w	Embryology	6	Soph., jr., sr.	1-2, 11 or 9-10
183s	Genetics and Eugenics	3	Jr., sr.	9-10

For additional courses, see the bulletin of the College of Science, Literature, and the Arts.

[1] The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

1f,w,s-2w,s,su. General Zoology. A survey of the animal kingdom, emphasizing the principles of development and structure in relation to functions and habit, heredity and evolution, and the animals of economic importance. Lectures, quizzes and laboratory. Nachtrieb, Sigerfoos, Lund, Ringoen.

9f-110w. Histology. A comparative microscopic study of the origin and structure of the tissues of vertebrates and invertebrates, and of the organs of mammals. Textbook, lectures, and laboratory. Downey.

11s. General Histology. A survey of the differentiation and specialization of the animal tissues and the construction of organs. Lectures, reference and laboratory work.

17f-18w. General Physiology. Physical and chemical properties of living protoplasm and cells. Various organisms are selected which show the nature of physiological processes and introduce the student to quantitative experimental methods in biology. Laboratory, lectures, and reading. Lund.

23s. Morphogenesis and the Behavior of Organisms. Physiology of development of the egg. Regeneration. Production of heat, light, and electricity in animals. Comparative physiology of the nervous system, sense organs, and reactions in lower animals. Laboratory, lectures, and reading. Lund.

35s. General Embryology. A survey of general embryology and the organogeny of the vertebrates. Conference, reference, and laboratory work. Nachtrieb.

37f-38w-39s. General Entomology. Elements of entomology leading up to discussion of the principles of taxonomy and their application to the classification of insects. Oestlund.

43s. Introductory Entomology. The structure, development, and classification of insects. An introductory course in entomology and preparatory for courses in economic entomology. Oestlund.

44f. Animal Parasites and Parasitism. Lectures and laboratory work. A consideration of the origin and biological significance of parasitism, and the structure, life history, and economic relations of representative parasites. Methods of control and prevention will be emphasized. Riley.

59s. General Ecology. A general course covering the relationships of animals, animal societies, and faunas to the inorganic and organic factors of the environment. The course consists of lectures, assigned reading, recitations, laboratory and field work. Chapman.

ADVANCED COURSES

107s. Protozoology. Lectures, reference and laboratory work on the structure and life histories of Protozoa, with special reference to the relation of the Protozoa to diseases of animals. Sigerfoos.

109f-110w. General Physiology. A thoro survey of fundamental physiological processes in organisms. Based on Bayliss's *Principles of General Physiology*. Laboratory, lectures, and reading. Lund.

114w-115s. ORNITHOLOGY. Structure, classification, and habits of birds with special reference to the birds of Minnesota. Considerable time devoted to field study. Bird or field-glass and handbook required. Laboratory, lectures, and quizzes. Class limited to ten. ROBERTS.

117f-118w-119s. ECOLOGY OF INSECTS. General principles of ecology with special reference to the insects of Minnesota. Lectures, laboratory, assigned reading, and field work. CHAPMAN.

124su. ADVANCED ECOLOGY. Similar to 117-118-119 with special field work. CHAPMAN.

125f-126w-127s. ADVANCED ENTOMOLOGY. Advanced work in the lines of morphology and classification of insects, with lectures on the history of entomology. OESTLUND.

130w. BIOLOGY AND TAXONOMY OF THE APHIDIDAE. Intensive study of the natural history, bibliography, and classification of the Aphididae. OESTLUND.

139s-140w. HISTOLOGY AND DEVELOPMENT OF INSECTS. Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. RILEY.

144f-145w-146s. ANIMAL PARASITES AND PARASITISM. Lectures and laboratory work. Origin and biological significance of parasitism, structure, life history, and economic relations of representative parasites. Second quarter devoted primarily to the relation of insects to disease of man and animals. RILEY.

181f-182w. EMBRYOLOGY. A survey of the principles of animal development and a detailed study of the development of the circulatory or urinogenital system of a vertebrate. Lectures, reference and laboratory work. NACHTRIEB.

183s. GENETICS AND EUGENICS. Facts and theories of heredity and the application of the laws governing natural inheritances for the improvement of the race. Lectures, references, quizzes, and demonstrations. NACHTRIEB.

ANIMAL HUSBANDRY

ANIMAL INDUSTRY GROUP

Professors CARL W. GAY, WALTER H. PETERS; Assistant Professor PHILIP A. ANDERSON; Instructors ARTHUR L. ANDERSON.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w	Types and Breeds of Livestock	5	All	None
2f	Livestock-Judging	3	Soph., jr., sr.	1
3f-4w	Market Classes of Livestock.	6	Soph., jr., sr.	2
5w	Livestock-Breeding	3	Sr.	Vet. Med. 6, Agron. 131

No.	Title	Credits	Offered to	Prerequisite courses
6w	Livestock Feeding.....	5	Sr.	Agr. Biochem. 15
7f	Meats	3	Sr.	3, Agr. Biochem. 15
8s	Elements of Feeding.....	3	Jr., sr.	None
9s	Pedigrees and Herd Books..	3	Sr.	5
	Advanced Courses			
101f	Advanced Stock-Judging ...	3	Sr.	3-4
102s	Horse Husbandry.....	3	Sr.	3-4, 5, 6
103s	Beef Cattle Husbandry.....	3	Sr.	3-4, 5, 6
104s	Sheep Husbandry.....	3	Sr.	3-4, 5, 6
105s	Swine Husbandry.....	3	Sr.	3-4, 5, 6
106w	Advanced Meats.....	3	Sr.	7
107s	Meat Problems.....	3	Sr.	106
108s	Seminar	3	Sr.	5, 6

INTRODUCTORY COURSES

1f,w. TYPES AND BREEDS OF LIVESTOCK. The types as related to performance or production in horses, beef cattle, sheep, and swine, and the origin, history, characteristics, and economic importance of the breeds, classified according to type. GAY.

2f. LIVESTOCK-JUDGING. Practice in judging horses, cattle, sheep, and hogs from both the type and the breed standpoint. A. L. ANDERSON

3f-4w. MARKET CLASSES OF LIVESTOCK. Livestock markets and marketing methods. The market classes of horses, cattle, sheep, and swine. Practice in classifying, judging, and appraising livestock. ———

5w. LIVESTOCK BREEDING. The application of the principles of genetics to the breeding of livestock; a review of the master-breeders' methods and consideration of the practical breeders' problems. GAY.

6w. LIVESTOCK FEEDING. Feeding livestock under farm conditions; efficiency and economy in growing and fattening meat animals; feeding draft horses and colts. Consideration of experimental work and present practice. Practical feeding problems. Only three credits allowed to those who have completed Course 8. PETERS.

7f. MEATS. General course in the dressing of animals and the cutting of carcasses. Lectures and laboratory work. P. A. ANDERSON.

8s. ELEMENTS OF FEEDING. A general course giving a brief survey of livestock and dairy feeding designed for students not majoring in animal industry. Not open to those who have completed Course 6 or Dy. Husb. 103. PETERS, RAYBURN.

9s. PEDIGREES AND HERD BOOKS. Pedigree registration; laboratory practice in the use of the stud, herd, and flock records; tracing and tabulating pedigrees. ———

ADVANCED COURSES

101f. ADVANCED STOCK-JUDGING. Competitive judging of all types, breeds, and classes of livestock supplemented by visits to nearby stock farms. PETERS.

102s. HORSE HUSBANDRY. Stud-farm management; the selection of foundation stock and the breeding, feeding, and marketing of horses. Horse-power; factors determining a horse's efficiency for work. GAY.

103s. BEEF CATTLE HUSBANDRY. The management of pure-blood and grade herds; selection of foundation stock, sales, and shows, building equipment, labor. Practicums in fitting cattle for show and sale, animal photography, preparation of feeds, and the care of cattle. PETERS.

104s. SHEEP HUSBANDRY. The care and management of pure-bred sheep. Study of pedigrees, registrations, fitting for show purposes, marketing. Practicums in feeding, shearing, blocking, and caring for young lambs. P. A. ANDERSON.

105s. SWINE HUSBANDRY. Hog-farm equipment, pure-bred vs. market hogs; building a breeding herd, private herd records, herd management, fitting and showing, marketing breeding stock. Barn work and feeding practice. ———

106w. ADVANCED MEATS. Practice work in dressing animals and cutting carcasses giving particular attention to conformation as related to dressing percentage and the carcass; also a study of the physical and chemical composition of meat. P. A. ANDERSON.

107s. MEAT PROBLEMS. The wholesale cuts and grades of meat; the packing industry and the utilization of by-products. Special problems and trips to packing establishments. P. A. ANDERSON.

108s. SEMINAR. Special problems and review of investigations pertaining to the livestock industry. GAY.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

Professor WINFORD P. LARSON; Assistant Professor ARTHUR T. HENRICI; Instructor ANNE G. BENTON; Assistant ROBERT G. GREEN.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
1f,w,s,su	General Bacteriology.....	5	Soph., jr., sr.	Chem. 1 yr., biol. 1 yr.
103w	Special Bacteriology for Students of Agriculture..	4	Soph., jr., sr.	1

For additional courses see the bulletin of the Medical School.

INTRODUCTORY COURSES

1f,w,s,su. GENERAL BACTERIOLOGY. Lecture and laboratory course. The principles and technique of general bacteriology. Studies in the morphologic and biologic characters of the common bacteria. Preparation of culture media. Disinfectants and disinfection. Bacteriology of water and food products. LARSON, BENTON, GREEN.

103w. SPECIAL BACTERIOLOGY FOR STUDENTS OF AGRICULTURE. Bacteriology of the soil in relation to fertility; the nitrogen fixing bacteria of legumes; bacteria that cause plant diseases; bacterial diseases of domestic animals; the bacteriology of milk and dairying. HENRICI.

BEE CULTURE

Professor FRANCIS JAGER; Assistant Professor GROVER C. MATTHEWS.

General statement.—Theoretical and practical instruction on bees, honey, and wax production. At least one year of botany should be completed before electing these courses. General zoology and entomology are also desirable. If not already completed they should be taken at same time as the courses in bee culture.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
1s,su	Elements of Beekeeping I..	3	Jr., sr.	None
2f,w	Elements of Beekeeping II..	3	Jr., sr.	None
3w-4s	Advanced Beekeeping.....	6	Jr., sr.	1 or 2
5su	Queen-Raising	3	Jr., sr.	1 or 2

INTRODUCTORY COURSES

1s,su. ELEMENTS OF BEEKEEPING I. Fundamentals of bee behavior during the active season. Fundamentals of beekeeping practice during the active season. Modern equipment for beekeeping practice. Production of wax, comb, and extracted honey. JAGER.

2f,w. ELEMENTS OF BEEKEEPING II. Fundamentals of bee behavior outside of the active season. Preparations for wintering. Indoor and outdoor wintering. JAGER.

3w-4s. ADVANCED BEEKEEPING. Anatomy, psychology, instinct, and reflex action, architecture and geometry of the honey comb, chemistry of pollen and honey. Pollenization and honey flora of the state. Bee diseases in their relation to honey production. JAGER.

5su. QUEEN-RAISING. Queen-judging, principles of reproduction, grafting, drone-raising, mating. Nuclei, mailing, introducing requeening. In connection with University Farm queen bee raising station. JAGER, MATTHEWS.

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors C. OTTO ROSENDAHL, ELIAS J. DURAND, LEE I. KNIGHT, JOSEPHINE E. TILDEN; Associate Professor FREDERIC K. BUTTERS; Assistant Professors WILLIAM S. COOPER, NED L. HUFF; Instructor ARTHUR M. JOHNSON.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,s-2w,f	General Botany	10[1]	All	None
7s	Taxonomy of Flowering Plants	5	All	2
11f	Algae and Fungi	5	Soph., jr., sr.	2
15w	Anatomy of Vascular Plants.	5	Soph., jr., sr.	2
51f	Histological Methods	3	Jr., sr.	15 cred.
52f	Plant Physiology	5	Jr., sr.	15 cred.
53w	Botany of Economic Plants.	5	Jr., sr.	15 cred.
54s	Elementary Ecology	5	Jr., sr.	15 cred.
62w	Bryophytes and Pteridophytes	5	Jr., sr.	15 cred.
63s	Angiosperms and Gymnosperms	5	Jr., sr.	7 or 62
	Advanced Courses			
105s	Algae	5	Jr., sr.	11
107w	Bryophytes	5	Jr., sr.	7, 62
108w	Pteridophytes	5	Jr., sr.	7, 62
110w	Gymnosperms	5	Jr., sr.	7, 63
113f-114w-115s	Advanced Taxonomy	9	Jr., sr.	7
118w-119s	Cytology	6	Jr., sr.	51
131f	Field Ecology	5	Sr.	54
133s	Forest Geography of North America	5	Sr.	54
141f	Advanced Plant Physiology I	5	Sr.	52, Org. Chem.
142w	Advanced Plant Physiology II	5	Sr.	52, Org. Chem.
143s	Advanced Plant Physiology III	5	Sr.	52, Org. Chem.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] Courses 2 must be completed before credit is allowed.

INTRODUCTORY COURSES

1f,s-2w,f. GENERAL BOTANY.[1] Fundamental principles of botany. Survey of organs of the flowering plant; its internal structure and physiology. Representatives of the algae, fungi, liverworts, etc., examined with special reference to tracing evolution of the vegetable kingdom. DURAND, BUTTERS, HUFF, JOHNSON.

[1] Students entering college with a year of high-school botany satisfactory to the department may be admitted directly to Course 2. All such must present to the department before registration, their high-school note-book and a statement from their teacher showing the amount and proficiency of their work.

7s. TAXONOMY OF FLOWERING PLANTS. A general study of the classification and relationships of flowering plants. Laboratory and field practice in the determination of species, together with lectures and quizzes. ROSENDAHL, JOHNSON.

11f. GENERAL MORPHOLOGY OF ALGAE AND FUNGI. A general survey of the structure, evolution, and classification of the algae and fungi. Lecture, laboratory, and field work. TILDEN.

15w. ANATOMY OF VASCULAR PLANTS. A study of the microscopic structure of vascular plants, the cell, tissues, and tissue systems with particular attention to the development and evolution of the vascular system in the root, stem, and leaf. BUTTERS.

51f. HISTOLOGICAL METHODS. Training in methods used in the preparation and preservation of class material. Special attention is given to methods of killing, imbedding, sectioning, staining, and mounting. DURAND.

52f. PLANT PHYSIOLOGY. An introductory course giving a general survey of plant functions. KNIGHT.

53w. BOTANY OF ECONOMIC PLANTS. A survey course treating the most important botanical features of the common plants. KNIGHT.

54s. ELEMENTARY ECOLOGY. An introduction to the study of plants and their environment; investigation of the habitat; its effects upon plants as individuals and in mass; plant communities; plant successions. Laboratory and field work, lectures, and discussion. COOPER.

62w. GENERAL MORPHOLOGY OF BRYOPHYTES AND PTERIDOPHYTES. A general survey of the structure, evolution, and classification of the liverworts, mosses, and ferns. HUFF.

63s. GENERAL MORPHOLOGY OF ANGIOSPERMS AND GYMNOSPERMS. A general survey of the structure, evolution, and classification of seed plants. BUTTERS.

ADVANCED COURSES

105s. ALGAE. A study of freshwater forms, based on collections made by the class. Lectures, laboratory, and field work. TILDEN.

107w. MORPHOLOGY AND TAXONOMY OF THE BRYOPHYTES. A special study of the structure and classification of the liverworts and mosses. (Not offered in 1920-21.) DURAND.

108w. MORPHOLOGY AND TAXONOMY OF THE PTERIDOPHYTES. An intensive study of lycopods, ferns, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference-reading, and laboratory work. BUTTERS.

110w. MORPHOLOGY AND TAXONOMY OF THE GYMNOSPERMS. An intensive study of cycads, conifers, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference-reading, and laboratory work. BUTTERS.

113f-114w-115s. ADVANCED TAXONOMY. An advanced course in which special attention is given to the taxonomy of difficult natural groups, involving systematic principles and practice, rules of nomenclature, systems of classification, etc. ROSENDAHL.

118w-119s. CYTOLOGY. A survey of cell structure and the various phenomena of division, fusion, and metamorphosis, together with a review of the history of cytological investigation. Methods of cytological research indicated in the laboratory. ROSENDAHL.

131f. FIELD ECOLOGY. A careful study of the local plant communities and successions, followed by a written report, and by a study of the general principles of plant association and succession. COOPER.

133s. FOREST GEOGRAPHY OF NORTH AMERICA. Preliminary discussion of principles of plant distribution, followed by detailed study of the forest regions of North America; reading, discussion, lantern slides, distribution maps, microscopic work, written reports. COOPER.

141f. ADVANCED PLANT PHYSIOLOGY I. Physical phases of plant physiology. A course dealing with the intake of materials and their translocation, also the energy relations of the plant. KNIGHT.

142w. ADVANCED PLANT PHYSIOLOGY II. Plant metabolism. A course dealing with the synthesis of plant food, its transformation and utilization by the plant. KNIGHT.

143s. ADVANCED PLANT PHYSIOLOGY III. Plant metabolism and growth. Continuation of 142, also introducing certain fundamental phases of growth. KNIGHT.

CHEMISTRY

THE SCHOOL OF CHEMISTRY

Professors LAUDER W. JONES,[2] CHARLES F. SIDENER; Associate Professors WILLIAM H. HUNTER, FRANK H. MACDOUGALL; Assistant Professors ISAAC W. GEIGER; Instructor GUY H. WOOLLETT.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f-2w-3s	General Inorganic Chemistry	12	All	None
9f-10w	Advanced General Inorganic Chemistry	10	All	H.-s. chem.
11s	Qualitative Chemical Analysis	4	Soph., jr., sr.	1-2-3

[2] Resigned, July 1, 1920.

No.	Title	Credits	Offered to	Prerequisite courses
12s-13f	Qualitative Chemical Analysis	10	Soph., jr., sr.	9-10
20w	Quantitative Analysis.....	5	Soph., jr., sr.	12-13
21s	Quantitative Analysis.....	5	Soph., jr., sr.	20
35f-36w	Organic Chemistry.....	10	Soph., jr., sr.	1-2-3 or 9-10
	Advanced Courses			
126s	Sanitary Water Analysis....	1 or 2	Sr.	21
140f-141w-142s	Physical Chemistry.....	9, 12, or 15	Jr., sr.	30 cred. Phys. 15 cred.

For additional courses see the bulletin of the School of Chemistry.

INTRODUCTORY COURSES

1f-2w-3s. General Inorganic Chemistry. Designed for those who have had no high-school chemistry. 1-2—A study of the general laws of chemistry and of the non-metals and their compounds. 3—A study of the metals and their compounds. ———

9f-10w. Advanced General Inorganic Chemistry. Designed for those who have had one year of high-school chemistry. 9—General laws of chemistry, the non-metals and their compounds. 10—Metals and their compounds and ionic equilibrium, considered quantitatively. ———

11s. Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. ———

12s-13f. Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. ———

20w. Quantitative Analysis. An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. Sidener, Geiger.

21s. Quantitative Analysis. Supplementary to Course 20. Further discussion of the principles and methods together with laboratory work in additional typical problems in gravimetric and volumetric analysis. Sidener, Geiger.

35f-36w. Organic Chemistry. An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. Hunter, Woollett.

ADVANCED COURSES

126s. Sanitary Water Analysis. Lectures and laboratory practice in the chemical examination of potable waters. Sidener, Geiger.

140f-141w-142s. PHYSICAL CHEMISTRY. A general survey of the subject. Laboratory work three or six hours per week. Nine, twelve, or fifteen credits, depending on amount of laboratory work. MACDOUGALL.

DAIRY HUSBANDRY

ANIMAL INDUSTRY GROUP

Professors CLARENCE H. ECKLES, JOSEPH R. KEITHLEY; Professor Emeritus THEOPHILUS L. HAECKER; Assistant Professors EDWIN O. HANSON, HAROLD MACY, ALLAN B. RAYBURN; Assistants CHESTER DAHLE, OTTO G. SCHAEFER; Extension Specialists ARTHUR J. MCGUIRE, WILLIAM A. MCKERROW, LESLIE V. WILSON.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s	Elements of Dairying.....	5	All	None
2w	Dairy Bacteriology.....	5	Soph., jr., sr.	Bact. 1
3f	Dairy Products.....	5	Jr., sr.	1, 2
4su	Cheese Factory Practice.....	3	Jr., sr.	1, 3
5su	Creamery Practice.....	3	Jr., sr.	1, 3
	Advanced Courses			
101f	Milk Production.....	5	Jr., sr.	1
102s	Market Milk.....	3	Jr., sr.	1, 2
103w	Dairy Stock Feeding.....	3	Sr.	101 Agr. Biochem. 15
104s	Advanced Study of Dairy Breeds	3	Jr., sr.	1, 101
105f	Seminar I.....	1	Sr.	3 courses in Dy. Husb.
106w	Seminar II.....	1	Sr.	3 courses in Dy. Husb.
107s	Seminar III.....	1	Sr.	3 courses in Dy. Husb.

INTRODUCTORY COURSES

1f,w,s. ELEMENTS OF DAIRYING. Composition of milk. Causes of variation in composition; milk constituents and their uses in dairy manufactures and as food; Babcock test; sanitary handling of milk and cream on the farm; cream-separating and farm butter-making. KEITHLEY, HANSON, DAHLE.

2w. DAIRY BACTERIOLOGY. Lectures and laboratory exercises. Types of milk organisms; the contamination of milk and how prevented; relation of milk to the public health; the bacteriology of butter-making and cheese-making. MACY.

3f. DAIRY PRODUCTS. The manufacture of butter, cheese, and ice cream with special reference to the chemical and bacteriological processes involved. Laboratory exercises to illustrate these principles. Organization, construction, and equipment of factories; factory accounting. KEITHLEY, DAHLE.

4su. CHEESE FACTORY PRACTICE. A minimum of one month's experience in an approved practical cheese factory. Records are kept and reports made. KEITHLEY.

5su. CREAMERY PRACTICE. A minimum of one month's experience in an approved practical creamery. Records are kept and a report made. KEITHLEY.

ADVANCED COURSES

101f. MILK PRODUCTION. Problems of the dairy farmer, such as characteristics and adaptations of dairy breeds; selection and management of dairy herd and sire; calf-raising; dairy barns. Laboratory: comparative judging and study of breed type. ECKLES, RAYBURN.

102s. MARKET MILK. Lectures and laboratory work. Classes of market milk; transportation and marketing; sanitary inspection; equipment of plants; problems of public control. KEITHLEY, MACY.

103w. DAIRY STOCK FEEDING. Application of principles of nutrition to feeding the dairy cow and growing young animals. Feeding standards; characteristics of various feeding stuffs; formulation of rations. Only two credits allowed those who have completed An. Husb. 8. ECKLES.

104s. ADVANCED STUDY OF DAIRY BREEDS. Practice in comparative judging of dairy cattle representing different breeds and ages; selection and valuation of cattle according to type and pedigree; a study of important strains and families; visits to pure-bred herds. RAYBURN, SCHAEFER.

105f. SEMINAR I. Special investigation and study of selected topics. Each student presents papers and reports on assigned subjects and reviews recent scientific investigations along dairy husbandry lines. ECKLES, KEITHLEY.

106w. SEMINAR II. Continuation of 105, but 105 not a prerequisite. ECKLES, KEITHLEY.

107s. SEMINAR III. Continuation of 106, but 106 not a prerequisite. ECKLES, KEITHLEY.

ECONOMICS

SCHOOL OF BUSINESS

Professors GEORGE W. DOWRIE, JOHN D. BLACK, ROY G. BLAKEY, NORMAN S. BRIEN GRAS, JOHN H. GRAY; Associate Professors WILLIAM W CUMBERLAND,[1] FREDERICK B. GARVER, ALVIN H. HANSEN, BRUCE D. MUDGETT; Assistant Professors Z. CLARK DICKINSON, CLARENCE L. HOLMES, HOWARD S. NOBLE, THOMAS H. SANDERS, J. WARREN STEHMAN, HOLBROOK WORKING; Professorial Lecturer J. FRANKLIN EBERSOLE; Instructors HILDING E. ANDERSON, CLYDE R. CHAMBERS, JOSEPH E. CUMMINGS, PAUL L. MILLER, VICTOR H. PELZ.

[1] On leave of absence, 1920-21.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
5f,w[1]	General Economics.....	5	Soph., jr., sr.	None
6f,w,s[1]	Agricultural Economics.....	3	Soph., jr., sr.	3-4, or 5
13s[1]	Agricultural Statistics.....	5	Soph., jr., sr.	3-4, or 5 and 6, or 7
18f[1]	Problems in Agricultural Economics	3	Soph., jr., sr.	3-4, or 5 and 6, or 7
20w-21s[1]	Economic History and Geography of Agriculture.....	10	All	None
23w	Principles of Organization and Management.....	5	Soph., jr., sr.	3-4, or 5 and 6
25f-26w	Principles of Accounting....	8	Soph., jr., sr.	None
28s[1]	Principles of Accounting (Agricultural)	5	Soph., jr., sr.	3-4, or 5 and 6, or 7
41s	Financial History of United States	3	Soph., jr., sr.	3-4, or 5 and 6
72f	Economics of Transportation	3	Jr., sr.	54
73w	Railway Traffic and Rates..	3	Jr., sr.	3-4, or 5 and 6
74s	Water Transportation.....	3	Jr., sr.	3-4, or 5 and 6
85f-86w	Marketing of Manufactured Products	6	Jr., sr.	3-4, or 5 and 6, and 9 other credits
88s	Advertising	3	Jr., sr.	85-86
89f[2]	Marketing of Agricultural Products	5	Jr., sr.	3-4, 5 and 6, or 7
	Advanced Courses			
103f-104w	Value and Distribution.....	6	Jr., sr.	3-4, or 5 and 6
107f[1]	Land Economics.....	5	Jr., sr.	18
108w[1]	Farm Marketing Problems..	3	Jr., sr.	89
109w[1]	Economics of Consumption.	3	Jr., sr.	3-4, or 5 and 6, or 7
110s-111f[1]	Practice Course in Marketing	3	Jr., sr.	89
112f-113w	Technique of Statistical Investigation	6	Jr., sr.	14
116w[1]	Economics of Agricultural Productions	3	Jr., sr.	18
117s[1]	Prices of Farm Products...	3	Jr., sr.	3-4, or 5 and 6, or 7
121f-122w-123s	Economic History of Europe		(Not given 1920-21)	
126f-127w-128s[1]	Special Research Problems in Agricultural Economics....	9	Jr., sr.	
131f	Cost Accounting.....	3	Jr., sr.	25-26
143f-144w	Money and Banking.....	10	Jr., sr.	3-4, or 5 and 6
145s	International Exchange.....	3	Jr., sr.	143-144
146w	Investments	3	Jr., sr.	54, 143-144
149s	Business Cycles.....	3	Sr.	143-144, and 54 or 146
150s[1]	Farm Finance.....	3	Soph., jr., sr.	3-4, or 5 and 6
154s	Public Utilities.....	3	Jr., sr.	54

[1] Given on agricultural campus.

No.	Title	Credits	Offered to	Prerequisite courses
161f	Labor Problems and Trade Unionism	3	Jr., sr.	3-4, or 5 and 6
166f	Employment and Personnel Management	3	Jr., sr.	3-4, or 5 and 6, and Psychology 1-2-3 or equivalent
176f	Commercial Policies.....	3	Jr., sr.	3-4, or 5 and 6
177w	Foreign Trade.....	3	Jr., sr.	176
191f-192w	Public Finance.....	6	Jr., sr.	3-4, or 5 and 6
193s	State and Local Taxation...	3	Jr., sr.	191-192

For additional courses, see bulletin of the School of Business.

INTRODUCTORY COURSES

5f,w. General Economics. The usual basic principles of economic science interpreted in terms of agriculture and forestry as well as of other industries. Holmes, Working, Miller.

6f,w,s. Agricultural Economics. The special body of economic principles that have been developed for agricultural production, exchange, and distribution, together with the application of these principles to agricultural problems. Holmes, Working.

13s. Agricultural Statistics. Statistical method applied to agricultural data. Black.

18f. Problems in Agricultural Economics. Application of the principles of agricultural economics to a number of the major agricultural problems. Each student partly chooses his own study problems. Holmes.

20w-21s. Economic History and Geography of Agriculture. (1) The evolution of modern agricultural production, tenure systems, and market distribution. (2) The forces determining past and present localization of agricultural products, types of agricultural production and agricultural markets. Holmes, Chambers.

23w. Principles of Organization and Management. Types of operating organization; specialization; coördination of men and departments; planning; delegation of authority; means of control; establishment and maintenance of standards for materials, operations, machinery; determination of business policies; personnel problems. Pelz.

25f-26w. Principles of Accounting. The purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts and other statements; introduction to partnership and corporation accounts. Laboratory course with supplementary lectures. Noble and others.

28s. Principles of Accounting (agricultural). Principles of general and cost accounting presented in somewhat abridged form. Noble, Sanders.

41s. FINANCIAL HISTORY OF THE UNITED STATES. A study of the development of the main features of our systems of money, banking, tariffs, and public finance including a consideration of war financiering and financial cycles. BLAKEY.

72f. ECONOMICS OF TRANSPORTATION. The theory and practice of rate-making. Government regulation, the conflict between state and federal authorities, and suggested improvements in control of transportation agencies. CUMMINGS.

73w. RAILWAY TRAFFIC AND RATES. Railway transportation from standpoint of business man and shipper. Freight shipping documents. Classification and tariffs, time and preference freight, private car lines, industrial trackage and terminal service, express rates and service, special passenger rates. CUMMINGS.

74s. WATER TRANSPORTATION. History and present status of inland waterway and ocean transportation in the United States with some reference to present development in representative foreign countries. Problems peculiar to water transportation in the United States. CUMMINGS.

85f-86w. MARKETING OF MANUFACTURED PRODUCTS. Organization of distributive channels; marketing of basic raw materials and manufactured products; relations, selling problems and methods of manufacturers, wholesalers, retailers, and other factors in the distributive system; price policies; price maintenance. PELZ.

88s. ADVERTISING. Planning and executing campaigns; commodity and market analysis; planning and preparation of copy; selection and use of media; trade marks; display, outdoor and direct advertising; relations of advertiser, agency, and publisher; social and economic aspects. PELZ.

89f. MARKETING OF AGRICULTURAL PRODUCTS. Study of the principles relating to the distribution of farm products; types of markets, middlemen, market organizations; costs; prices; coöperative marketing. ANDERSON.

ADVANCED COURSES

103f-104w. VALUE AND DISTRIBUTION. An advanced course in economic theory devoted chiefly to the study of recent theories of wages, interest, rent, and profits. Assigned readings and reports on current problems in distribution. GARVER.

107f. LAND ECONOMICS. A study of several problems arising out of the land basis of civilization, such as property in land, land utilization, land classification, land settlement, status of the agricultural classes, farm labor, farm ownership and tenancy. BLACK.

108w. FARM MARKETING PROBLEMS. Studies of the problems and methods of marketing selected farm products with special reference to the Twin City markets. BLACK, ANDERSON.

109w. ECONOMICS OF CONSUMPTION. Nature of human wants; standards of living; cost of living; income, administration of income; nature of demand; demand and price; relation of consumption to the population problem. BLACK.

110s-111f. PRACTICE COURSE IN MARKETING. Eight to twelve weeks of experience as an employee in central or local markets. Careful study and observation of methods. Written plans and reports. BLACK, ANDERSON.

112f-113w. TECHNIQUE OF STATISTICAL INVESTIGATION. Primary and secondary investigations; statistical units, preparation, filling, and editing of schedules; classification and tabulation of returns; presentation of results. Readings, field work, and reports. MUDGETT.

116w. ECONOMICS OF AGRICULTURAL PRODUCTION. Detailed analysis of the economic principles underlying agricultural production; economic characteristics and functions of the factors of production; proper combinations of factors; selection of enterprises. HOLMES.

117s. PRICES OF FARM PRODUCTS. Price determination in the various markets for various classes of farm products; analysis of forces determining prices. BLACK, WORKING.

121f-122w-123s. ECONOMIC HISTORY OF EUROPE, 1300-1750. The chief interests are the manor; the town; the metropolis; national economic regulations; developments in agriculture, commerce, manufacture, and economic thought, leading up to the industrial revolution. (Not offered in 1920-21.) GRAS.

126f-127w-128s. SPECIAL RESEARCH PROBLEMS IN AGRICULTURAL ECONOMICS. Intensive individual research work on problems not being studied in the seminar during the quarter. BLACK, HOLMES, WORKING.

131f. COST ACCOUNTING. General principles of cost accounting; elements of cost; methods of arriving at costs and of distribution of overhead; application of cost accounting principles to selling, banking, mining, farming, etc. NOBLE.

143f-144w. MONEY AND BANKING. Relation to industrial system. Monetary principles with special reference to United States. American banking and bank organization, principles of commercial banking, non-commercial banking, relation of government to banking, comparative study of leading foreign systems. DOWRIE, STEHMAN, EBERSOLE.

145s. INTERNATIONAL EXCHANGE. Theory of international exchange, pars of exchange with gold, silver, and paper standard countries; the rates of exchange; financing imports and exports; bankers' bills; futures, arbitage; specie movements; the present foreign exchange situation. DOWRIE.

146w. INVESTMENTS. Sources of demand and supply of capital; bond houses and stock exchanges as marketing media, criteria for personal selection of prime investments; government, municipal, corporation, and real estate loans; and the use of bond tables. EBERSOLE.

149s. BUSINESS CYCLES. American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression, and financial panics. Critical examination of all the available business barometers designed to forecast similar conditions. EBERSOLE.

150s. FARM FINANCE. The financial needs of typical farmers. Present facilities for supplying them; institutions, their organization and operation, interest rates, defects, and proposed remedies. The financing of the various farm organizations. The farmer as an investor. DOWRIE.

154s. PUBLIC UTILITIES. Economic and legal bases of classification. Relative advantages of public ownership and regulation. Central and municipal regulation compared. The basis of rates; relative rates; rates and service. Summary of the theories of valuation. GRAY.

161f. LABOR PROBLEMS AND TRADE UNIONISM. Origin of the labor problem; conditions of labor in American industries; structure, aims, policies, and methods of trade and industrial unionism and employers' associations; collective bargaining and shop committees; mediation and arbitration; injunctions; labor legislation. HANSEN.

166f. EMPLOYMENT AND PERSONNEL MANAGEMENT. Organization and routine of employment department; selecting employees, records, follow-ups; standardization of labor requirements; problems of labor turn-over; service and welfare features, as safety, education, recreation. Practice in representative establishments. Written report. DICKINSON.

176f. COMMERCIAL POLICIES. Theory of international commerce; free trade, reciprocity, protection, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign policies, and other governmental and organized efforts to affect trade. American problems emphasized. BLAKEY.

177w. FOREIGN TRADE. Nature and methods of foreign trade. Character of the foreign trade of the United States and leading countries of the world; organization for foreign trade. BLAKEY.

191f-192w. PUBLIC FINANCE. National government revenues, expenditures, and debts. This includes a study of the principles and various forms of taxation, budgetry legislation and control, war and emergency fianciering, the shifting and incidence of taxes and fiscal reforms. BLAKEY.

193s. STATE AND LOCAL TAXATION. Principles and problems, e.g., state and local taxation of lands, mineral resources, forests, corporation, incomes, inheritances: also studies of classification, separation, local option, exemption, double taxation, evasion, assessment, centralized administration. BLAKEY.

EDUCATION

COLLEGE OF EDUCATION

Professors MELVIN E. HAGGERTY, FLETCHER H. SWIFT; Associate Professor WILFORD S. MILLER; Assistant Professors HERMIONE L. DEALEY, MARVIN J. VAN WAGENEN; Instructors JEAN H. ALEXANDER, FRANCES MOREHOUSE.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s	Brief Course in the History of Education	5	Jr., sr.	Psychol. 9 cred. of which 6 may be in educ. psychol.
5s[1]	The American School	3	Jr., sr.	Psychol. 6 cred.
11f,w,s	Technique of Teaching	3	Jr., sr.	Psychol. 9 cred. of which 6 may be in educ. psychol.
55f,w,s	Elementary Educational Psychology	3	Jr., sr.	Psychol. 6 cred.
	Advanced Courses			
101f-102w-103s	Historical Foundations of Modern Education	9	Jr., sr.	Psychol. 9 cred. of which 6 may be in educ. psychol. Hist. 10 cred.
106f-107w-108s	Advanced Educational Psychology	9	Sr.	Psychol. 9 cred. of which 6 may be in educ. psychol.
111s	Educational Diagnosis	3	Sr.	1-2 or 101-102-103, 3

For additional courses see the bulletin of the College of Education.
[1] Given at University Farm.

INTRODUCTORY COURSES

1f,w,s. A BRIEF COURSE IN THE HISTORY OF EDUCATION. Current school problems and educational theories in the light of their history. Emphasis upon secondary education and those aspects of education of most immediate concern to high-school teachers. Not open to those who have credit in Course 5. ALEXANDER, SWIFT.

5s. THE AMERICAN SCHOOL. A brief survey of the factors determining the problem of public education in America, followed by a brief account of the development and organization of typical state school systems. Not open to those who have credit in Course 1. ALEXANDER.

11f,w,s. TECHNIQUE OF TEACHING. Types of classroom exercises; preparation of teaching plans; hygiene of instruction; classroom management; the professional ethics of teaching; observation of high-school work. MILLER, MOREHOUSE.

55f,w,s. ELEMENTARY EDUCATIONAL PSYCHOLOGY. Brief scientific study of individual behavior from standpoint of learning process. Special emphasis, economy of time and energy in learning, instinctive and emotional reactions, habit formation, methods of learning, fatigue. HAGGERTY, DEALEY.

ADVANCED COURSES

101f-102w-103s. FOUNDATIONS OF MODERN EDUCATION. Interpretative historical study of elements in modern education derived from Hebrews, Greeks, Romans, Middle Ages, etc. Emphasis upon secondary and higher education, origin and results of monopoly of cultural conception of education and cultural studies. SWIFT.

106f-107w-108s. ADVANCED EDUCATIONAL PSYCHOLOGY. Psychology of learning. Methods of measuring rate of learning; study of typical learning experiments and examination of the conditions of the most economic learning, study of individual differences, and psychology of the school subjects. VAN WAGENEN.

111s. EDUCATIONAL DIAGNOSIS. A study of educational scales and standard tests for measurement of efficiency in school subjects. The course will deal with the nature of the tests, methods of their use, and an analysis of results obtained. VAN WAGENEN.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors WILLIAM A. RILEY, ARTHUR G. RUGGLES, FREDERIC L. WASHBURN; Associate Professor WILLIAM MOORE; Assistant Professors ROYAL N. CHAPMAN, HARRY H. KNIGHT, OSCAR W. OESTLUND; Instructor SAMUEL A. GRAHAM.

General statement.—Courses in this department are closely correlated with those offered by the Department of Animal Biology of the College of Science, Literature, and the Arts. Courses 37-38-39, 44, 117-118-119, 125-126-127, 130, 139-140, 144-145-146, and 197 of this division are also offered under these numbers by the Department of Animal Biology.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,s,su	Introductory Entomology....	5	Soph., jr., sr.	An. biol. 10 cred.
2w,su	Economic Entomology.....	5	Soph., jr., sr.	1
3f	Elementary Economic Entomology	3	Soph., jr., sr.	An. biol. 10 cred.
4f	Economic Vertebrate Zoology	3	Jr., sr.	An. biol. 10 cred.
5f	Elementary Forest Entomology	3	Soph., jr., sr.	An. biol. 10 cred.
6w	Insects of Forest Products..	3	Soph., jr., sr.	5
12w	Forest Zoology.....	3	Jr., sr.	An. biol. 10 cred.
16s	Plant Pest Control.....	3	Jr., sr.	1-2, or 3, Pl. Path. 1
37f-38w-39s	General Entomology.....	9	Soph., jr., sr.	An. biol. 10 cred.
44s	Introductory Course in Animal Parasites and Parasitism	3	Soph., jr., sr.	An. biol. 10 cred.
	Advanced Courses			
117f-118w-119s	General Ecology of Insects..	9	Jr., sr.	1-2 or 37-38-39
125f-126w-127s	Advanced General Entomology	9	Jr., sr.	1-2 or 37-38-39
130w	Biology and Taxonomy of the Aphididae	5	Sr.	1-2 or 37-38-39
139f-140w	Histology and Development of Insects.....	6	Jr., sr.	1-2 and 37-38-39
144f-145w-146s	Animal Parasites and Parasitism	9	Jr., sr.	1-2 and 37-38-39
150f,su	Insecticides and Their Action	3 or 6	Jr., sr.	1-2, or 37-38-39 Agr. Biochem., 7-8 or equiv.
197f,w,s,su	Introduction to Research....	5 or more	Sr.	1-2 or 37-38-39 and other work as prescribed by the division

INTRODUCTORY COURSES

1f,s,su. INTRODUCTORY ENTOMOLOGY. Lectures and laboratory work on the characteristics and habits of insects. OESTLUND, RILEY.

2w,su. ECONOMIC ENTOMOLOGY. The life histories, habits and methods of control of the insect pests of orchard, field, and garden. Laboratory work in the determination of the more important forms. RUGGLES.

3f. ELEMENTARY ECONOMIC ENTOMOLOGY. A brief course dealing with the characteristics and habits of insect pests and beneficial insects and methods of control. Not open to students planning to major in the field of entomology. RUGGLES.

4f. ECONOMIC VERTEBRATE ZOOLOGY. Relations of birds and wild animals to agriculture. Lectures, laboratory, and field work. Identification and studies of Minnesota birds and wild animals affecting the horticulturist and agriculturist, methods of combating injurious and conserving useful forms. WASHBURN.

5f. ELEMENTARY FOREST ENTOMOLOGY. A study of the life histories and methods of controlling insects affecting shade and forest trees. Not open for credit to students majoring in the field of entomology. GRAHAM.

6w. INSECTS OF FOREST PRODUCTS. Treating life history, habits, and control of insects attacking dead or freshly felled wood, and forest products. GRAHAM.

12w. FOREST ZOOLOGY. Forest animals. Relation of birds and of various four-footed animals to forest protection. Habits, range, usefulness; the manner of protecting the important large and small game, fish, and birds; fish culture. Lectures and laboratory work. WASHBURN.

16s. PLANT PEST CONTROL. The theory and practice of control of insect and fungous pests of crop plants. Practical applications. Not open to those who have completed Plant Pathology 14. Same as Plant Pathology 6. RUGGLES, STAKMAN.

37f-38w-39s. GENERAL ENTOMOLOGY. A more extended course than 1, leading up to discussion of the principles of taxomony and their application to the classification of insects. Textbook, lectures, quizzes, and laboratory. OESTLUND.

44s. INTRODUCTORY COURSE IN ANIMAL PARASITES AND PARASITISM. Lectures and laboratory work. A consideration of the origin and biological significance of parasitism, and of the structure, life history, and economic relations of representative animal parasites. Methods of control and prevention will be emphasized. RILEY.

ADVANCED COURSES

117f-118w-119s. GENERAL ECOLOGY OF INSECTS. General ecology with special reference to the insects of Minnesota. Frequent field trips. Lectures, laboratory, and field work. CHAPMAN.

125f-126w-127s. ADVANCED GENERAL ENTOMOLOGY. Advanced work in the lines of morphology and classification of insects with lectures on the history of entomology. Lectures and laboratory. OESTLUND.

130w. BIOLOGY AND TAXONOMY OF THE APHIDIDAE. Intensive study of the natural history, bibliography, and classification of the Aphididae. Additional work is offered in Course 197. OESTLUND.

139f-140w. HISTOLOGY AND DEVELOPMENT OF INSECTS. Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. Individual work along these lines is available to properly qualified students in Course 197. RILEY.

144f-145w-146s. ANIMAL PARASITES AND PARASITISM. Lectures and laboratory work. Origin and biological significance of parasitism; structure, life history, and economic relations of representative parasites. Second term devoted primarily to the relation of insects to diseases of man and animals. RILEY.

150f,su. INSECTICIDES AND THEIR ACTION. A study of the chemical composition, the physical properties, and the physiological action of standard, of little-known, and of new insecticides. MOORE.

197f,w,s,su. INTRODUCTION TO RESEARCH. Preparation for investigational work in lines of entomology, parasitology, or economic zoology. Advanced laboratory, field and library work; training in preparation of bibliographies and manuscripts; special problems. Summer work should be planned when possible. OESTLUND, KNIGHT, Systematic Entomology; RUGGLES, General Economic Entomology; CHAPMAN, Insect Ecology; MOORE, Insecticides; RILEY, Parasitology, Insect Morphology; WASHBURN, Economic Vertebrate Zoology.

FARM ENGINEERING

Professor WILLIAM BOSS; Associate Professor HARRY B. ROE; Assistant Professors JAMES B. TORRANCE, ARTHUR G. TYLER, HALL B. WHITE; Instructors J. GRANT DENT, MAURICE G. JACOBSON, ALLEN D. JOHNSTON.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
3f,s	Mechanical Drawing	3	All	None
4w	Blacksmithing	3	All	None
5f	Carpentry	3	All	None
7w	Farm Structures	3	Jr., sr.	3
8f,w	Farm Engineering	5	All	None
11f,w	Applied Mathematics	5	All	None
13f,s	Farm Motors	3	All	None
15f,s	Mechanical Laboratory	2	All	None
17f	Advanced Blacksmithing	3	All	4
18s	Surveying	5	Jr., sr.[1]	3, 11 or equiv.
21f-22w	Agricultural Physics	10	All	None
28w	Land Clearing	3	Jr., sr.	None
29f	Drainage	3	Sr.	8, 18
30s	Household Physics	5	All	None

[1] Open also to sophomores in Forestry.

INTRODUCTORY COURSES

3f,s. MECHANICAL DRAWING. Materials, instruments, and their uses. The conventions, lettering, scale reading, kinds of drawings, practice in cabinet projection and drawing building plans. JACOBSON.

4w. BLACKSMITHING. The management of forge and fire in bending, shaping and welding iron. JOHNSTON.

5f. CARPENTRY. The use and care of carpentry tools. The construction of farm equipment such as hayracks, self-feeders, etc. Building construction. Painting and wood finishing. WHITE.

7w. FARM STRUCTURES. The planning, designing, and location of farm buildings including specifications and estimates of cost. WHITE.

8f,w. FARM ENGINEERING. A general course of farm engineering. Lectures on farm measurements, drainage, water supply, irrigation, sanitation, buildings, roads, power, machinery, and land clearing. BOSS.

11f,w. APPLIED MATHEMATICS. Rules of practical mathematics with special attention to formulas and problems directly related to agricultural and forestry work; e.g., areas, volumes, percentages, proportions, variations, investments, cost problems, etc. ROE.

13f,s. FARM MOTORS. Theory, operation, care, and repair of gasoline engines. TORRANCE.

15f,s. MECHANICAL LABORATORY. Exercises in harness repair, knots and rope splicing, belt lacing, soldering, babbitting, pipe fitting, drilling, and work with cold metals. DENT.

17f. ADVANCED BLACKSMITHING. Bending, shaping, welding, and tempering of steel. JOHNSTON.

18s. SURVEYING. Plain surveying as applied to farm and forestry. Mensuration, leveling, simple grade determination, elements of topography, and farm-mapping. ROE.

21f-22w. AGRICULTURAL PHYSICS. Mechanics of solids and fluids, sound and heat, light, electricity, and magnetism, and their application to farm problems. TYLER.

28w. LAND-CLEARING. A study of land-clearing methods, explosives, and machinery. ———

29f. FARM DRAINAGE. Principles and practice of farm drainage. Field technique of drainage construction. Drainage administration and law. This course is for students wishing to do special work in drainage. ROE.

30s. HOUSEHOLD PHYSICS. Mechanics of solids and fluids; heat, light, sound, electricity, and magnetism. Application of physics to household problems. TYLER.

FORESTRY

Professor EDWARD G. CHEYNEY; Instructor GILBERT H. WIGGIN.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,s	General Forestry	4	All	None
26f,w	Tree Crops	1	All	None
27w	Groves and Windbreaks	3	All	None

For additional courses see the bulletin of the Courses in Forestry.

INTRODUCTORY COURSES

1f,s. GENERAL FORESTRY. A brief history of the development of forestry in Europe and America; its bearing on the forestry problems of the United States; description of the forests of the United States. Lectures and collateral reading. CHEYNEY.

26f,w. TREE CROPS. The part trees play in the successful development of the farm. The relation of the forests to agriculture and animal husbandry. The farm and the timber supply. CHEYNEY.

27w. GROVES AND WINDBREAKS. Trees and their relation to the farm. Planning and planting farm windbreaks and shelterbelts. Utilization and marketing of farm, grove, or woodlot products. WIGGIN.

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors WILLIAM H. EMMONS, FRANK F. GROUT; Assistant Professors THOMAS M. BRODERICK,[1] CHESSLEY J. POSEY; Instructors GEORGE M. SCHWARTZ, ARTHUR J. TIEJE.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,s-2w,su	General Geology	10[2]	Soph., jr., sr.	Chemistry
4w	Geology of Minnesota	5	Soph., jr., sr.	1-2
5f-6w	Economic Geology	6[2]	Jr., sr.	1-2
7f,s-8w,su	Laboratory Work	2[2]	Soph., jr., sr.	Supports 1-2
11f-12w	General Geology	8[2]	Soph., jr., sr.	None
21w-22s	Elements of Mineralogy	10[2]	Soph., jr., sr.	See statement
29f	General Physiography	5	Soph., jr., sr.	None
34w	Meteorology	3	Soph., jr., sr.	None
37s	Economic and Commercial Geography	3	All	None

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[2] Both quarters must be completed before credit will be given.

INTRODUCTORY COURSES

1f,s-2w,su. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours. EMMONS, TIEJE.

[1] On leave of absence, 1920-21.

4w. GEOLOGY OF MINNESOTA. The physical geography and geologic history of Minnesota. The relations of industrial development to geological features. The principles of pre-Cambrian geology as exemplified in Minnesota. (Not offered in 1920-21.)

5f-6w. ECONOMIC GEOLOGY. The mineral resources of the United States. The origin, occurrence, distribution, and uses of the more important minerals and mineral fuels of economic value. Lectures, and field excursions. SCHWARTZ.

7f,s-8w,su. LABORATORY WORK. Open only to students taking Course 1-2. Supplements Course 1-2 with study of rocks and ores, topographic and geologic maps, and reference reading. ———

11f-12w. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, and structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours. TIEJE.

21w-22s. ELEMENTS OF MINERALOGY. Open to students taking chemistry. The crystal systems; morphological, physical, and chemical character of minerals; occurrence, genesis, and uses of minerals; classification and description of common minerals. Determinative work in laboratory, blowpipe analysis, sight identification. GROUT, BRODERICK.

29f. GENERAL PHYSIOGRAPHY. Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology; field excursions. POSEY.

34w. METEOROLOGY. The properties and phenomena of the atmosphere, including composition, temperature, pressure, and circulation; the work of the weather bureau; the major climatic divisions of the earth and their climates. POSEY.

37s. ECONOMIC AND COMMERCIAL GEOGRAPHY. A study of the geographic factors influencing production and trade. Natural resources in their relation to commerce and industry and the major trade routes will be emphasized. POSEY.

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, JAMES DAVIES, ALFRED E. KOENIG, SAMUEL KROESCH, WALTER R. MYERS; Instructors LYNWOOD DOWNS, RICHARD JENTE.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,s	Beginning	5	All	None
2f,w	Beginning, Intermediate	5	All	1 or 1 yr. prep. German
3f,s	Beginning, Advanced	5	All	2
10f,s	Rapid Reading	5	All	3
11w,s	Advanced Rapid Reading	5	All	10
12f,s	Narrative Prose	5	All	2 yrs. prep. German
13f,w	Advanced Narrative Prose	5	All	12
28w-29s	Advanced Chemical German	6[1]	All	15
31f,w-32w,s	Medical German	6[1]	All	10 or 12 or 15
40w	Commercial German	5	All	10 or 13
50f-51w-52s	Composition	3[1]	Soph., jr., sr.	11 or 13
53f-54w-55s	Conversation	3[1]	Soph., jr., sr.	11 or 13
62f,s	German Comedies	3	Soph., jr., sr.	11 or 13
63w	Modern Drama	3	Soph., jr., sr.	11 or 13
64s	Classic Drama	3	Soph., jr., sr.	62 or 63

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] All quarters must be completed before credit is granted.

INTRODUCTORY COURSES

1f,s. BEGINNING. Pronunciation, conversation, grammar, and composition; selected readings in easy prose and verse. ———

2f,w. BEGINNING, INTERMEDIATE. Continuation of Course I. ———

3f,s. BEGINNING, ADVANCED. Selected texts from modern writers. ———

10f,s. RAPID READING. Modern narrative prose. KROESCH.

12f,s. NARRATIVE PROSE. Reading texts selected from modern prose writers. Grammar review and composition. ———

13f,w. ADVANCED NARRATIVE PROSE. Continuation of Course 13. ———

28w-29s. ADVANCED CHEMICAL GERMAN. Selections from more difficult works on chemistry. SCHLENKER, MYERS.

31f,w-32w,s. MEDICAL GERMAN. Readings from general works on physiology, anatomy, and bacteriology. BURKHARD.

40w. COMMERCIAL GERMAN. Vocabulary of commerce, business forms; reading of texts on economics.

50f-51w-52s. COMPOSITION. Aims to develop grammatical correctness. Translations from English selections. Essay writing on assigned subjects. DAVIES.

53f-54w-55s. CONVERSATION. Aims to develop ease and correctness of oral expression. Organized on the laboratory plan—one hour credit with two hours of recitation and one hour of outside reading. MYERS.

62f,s. GERMAN COMEDIES. Reading of the best comedies of the eighteenth and nineteenth centuries. DAVIES, MYERS.

63w. MODERN DRAMA. Plays of modern dramatists; Hauptmann, Sudermann, Fulda, and others. DAVIES, MYERS.

64s. CLASSIC DRAMA. Plays of Lessing, Goethe, and Schiller. DAVIES, MYERS.

HOME ECONOMICS

Professor MILDRED WEIGLEY; Instructor ALICE M. CHILD.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Course			
24s	Camp Cookery	3	All	None

For additional courses see the bulletin of the Courses in Home Economics.

INTRODUCTORY COURSE

24s. CAMP COOKERY. Designed to give prospective foresters, engineers, and others a knowledge of the simpler cookery processes, and of such adaptations as are practicable in the several types of out-of-doors camps. Given in alternate years. (Not offered in 1920-21.) CHILD.

HORTICULTURE

Professors WILLIAM H. ALDERMAN; Associate Professors WILFRID G. BRIERLEY, LEROY CADY, MAXWELL J. DORSEY; Instructor FRED A. KRANTZ; Assistants JOHN W. BUSHNELL, WILLIAM T. TAPLEY; Extension Specialist ROGER S. MACKINTOSH.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
6f	Fruit-Growing	3	Soph., jr., sr.	90, Bot. 10 cred.
21w	Small Fruit Culture	3	Soph., jr., sr.	90, Bot. 10 cred.
32s	Vegetable-Growing	3	Soph., jr., sr.	90, Bot. 10 cred.
33w	Vegetable-Forcing	3	Soph., jr., sr.	90, Bot. 10 cred.
35w	Potato Production	3	Soph., jr., sr.	90, Bot. 10 cred.
50s	Floriculture	3	All	None
56w,s	Propagation and Nursery Practice	3	Soph., jr., sr.	90
71f	Landscape-Gardening	3	All	None
90f,s	General Horticulture	3	All	Soils 2
91s	Advanced General Horticulture	3	Jr., sr. in Agr. Educ.	90
93f	Judging Horticultural Crops.	2	Soph., jr., sr.	90
	Advanced Courses			
107f	Orchard Management	3	Jr., sr.	6
108w	Fruit-Handling	3	Jr., sr.	90

No.	Title	Credits	Offered to	Prerequisite courses
109f	Principles of Genetics.....	3	Jr., sr.	Bot. 10 cred. An. Biol. 10 cred.
110w	Horticultural Crop-Breeding.	3	Jr., sr.	109
111f	Systematic Pomology.....	3	Jr., sr.	6
131f	Advanced Vegetable Production	3	Sr.	32
132f	Systematic Olericulture.....	3	Jr., sr.	32
133w	Commercial Truck-Growing..	3	Jr., sr.	90
151f	Advanced Floriculture.....	3	Jr., sr.	50, Bot. 10 cred.
191w-192s	Special Problems.....	6	Jr., sr.	Special permission
193f-194w-195s	Horticultural Seminar.....	3	Jr., sr.	9 cred.

INTRODUCTORY COURSES

6f. FRUIT-GROWING. The fundamental principles of fruit-growing. Sites, soils, nursery stock, planting and planting plans, tillage, fertilization, cover crops, pollination, frost avoidance, pruning, and thinning. Lectures, recitations, references, and laboratory work. BRIERLEY.

21w. SMALL FRUIT CULTURE. A study of the cultural practices for each of the small fruits Brief consideration is given to their botanical relationships and the history of the commercial development. Lectures, problems, and survey of literature. BRIERLEY.

32s. VEGETABLE-GROWING. Fundamentals of vegetable-growing applied to commercial and home gardens, scope of vegetable-gardening and place in agriculture. Capital required, locations, soil, equipment, marketing, storage, systems of production. Cultural methods for the various crops. BUSHNELL, TAPLEY.

33w. VEGETABLE-FORCING. Commercial growing of vegetables in the greenhouse; types, construction, and management of forcing structures, soils, fertilization, soil sterilization, relation of industry to outdoor vegetable farming; crop production and marketing. TAPLEY.

35w. POTATO PRODUCTION. A study of the origin, botany, regional distribution, economic importance, group classification, standardization of varieties according to soil, climate, and markets. Identification, exhibiting, judging, cultural methods, seed selection and certification, marketing and utilization. KRANTZ, TAPLEY.

50s. FLORICULTURE. Designed to give the student a working knowledge of the culture and uses of common house plants, annuals, perennials, and greenhouse plants. Lectures, reference-reading, and laboratory. CADY.

56w,s. PROPAGATION AND NURSERY PRACTICE. Methods of propagating plants by seed, cuttings, layers, and grafting. Practical work in management of nursery stock, bulbs, and plants. Lectures, reference-reading, and field trips. CADY.

71f. LANDSCAPE-GARDENING. The practice and principles of landscape-gardening as applied to the home and community. Lectures and field trips to parks and private grounds. CADY.

90f,s. GENERAL HORTICULTURE. A study of the horticultural industry, including the elements of fruit-growing, vegetable-growing, plant propagation, and landscape-gardening. ALDERMAN, BRIERLEY, CADY, TAPLEY.

91s. ADVANCED GENERAL HORTICULTURE. For students in agricultural education. Continuation of Course 90 with emphasis given to more advanced problems in orchard and garden management, judging and exhibiting, management of school gardens, ornamental planting of home and school grounds. ALDERMAN, BRIERLEY, CADY, TAPLEY.

93f. JUDGING HORTICULTURAL CROPS. The principles and practice of judging and exhibiting fruits, vegetables, and flowers. ALDERMAN, BRIERLEY, CADY, TAPLEY.

ADVANCED COURSES

107f. ORCHARD MANAGEMENT. A detailed study of the various operations in orchards and berry fields. Operating costs and profits. Lectures, laboratory, and individual problems. BRIERLEY.

108w. FRUIT-HANDLING. A study of fruit-handling operations from orchard to consumer. Lectures, laboratory, assigned readings, and excursions. BRIERLEY.

109f. PRINCIPLES OF GENETICS. Lectures and laboratory work designed to familiarize the student with the underlying principles of breeding, heredity, variation, biometry, and evolution are emphasized. Same as Agronomy 103. DORSEY, HAYES.

110w. HORTICULTURAL CROP-BREEDING. Applied genetics are emphasized. The method of breeding each of the important horticultural crops with special attention to experiment station investigations and to the methods used by plant breeders. DORSEY.

111f. SYSTEMATIC POMOLOGY. A study of fruit varieties. Classification, description, identification, and elements of judging. Lectures, laboratory, and a survey of the literature. ALDERMAN, BRIERLEY.

131f. ADVANCED VEGETABLE PRODUCTION. A study of the business of vegetable-gardening, special problems, variety improvement, production of seed, investigation and research, reviews and reports on recent literature. TAPLEY.

132f. SYSTEMATIC OLERICULTURE. The origin, botany, varieties, and types of the different vegetables, their characteristics and adaptation to different cultural and market conditions, identification and classification studies, judging and exhibiting. TAPLEY.

133w. COMMERCIAL TRUCK-GROWING. Truck-growing centers of the United States, cultural methods, special machinery and equipment, market methods, shipping points. Adaptation of the truck crops to Minnesota, commercial production for canneries, handling and shipping. TAPLEY.

151f. ADVANCED FLORICULTURE. Lectures, assigned readings, laboratory, and special problems dealing with the culture, botany, and history of florists' plants and methods of greenhouse management. CADY.

191w-192s. SPECIAL PROBLEMS. A study of problems based upon the work given in the preceding courses. ALDERMAN.

193f-194w-195s. HORTICULTURAL SEMINAR. Reports and discussions of problems and investigational work. Horticultural Staff.

MILITARY SCIENCE AND TACTICS

Professor ALBERT G. GOODWYN, Captain, Infantry, U.S.A., Chairman; Assistant Professors BEN W. FIELD, Captain, Infantry, U.S.A.; LAURENCE T. WALKER, Captain, Coast Artillery Corps, U.S.A.; LEE R. WATROUS, JR., Captain, Coast Artillery Corps, U.S.A.; EDGAR B. MOOMAU, 1st Lieutenant, Infantry, U.S.A.; HARVEY G. THOMAS, 1st Lieutenant, U.S.A., Retired; Instructors JOEL R. BAKER, Master Signal Electrician, Signal Corps, U.S.A.; ALFRED BRANDT, Regimental Sergeant Major, Infantry, U.S.A.; HENRY W. BROWN, Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; KENNA B. CALDWELL, Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; AUBREY R. DUNKUM, 1st Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; WILLIAM FINKE, 1st Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; JOSEPH HAVLICEK, Regimental Commissary Sergeant, Infantry, U.S.A., Retired; WILLIAM L. HOGAN, 1st Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; INGVALD M. JOHNSON, 1st Sergeant, Infantry, Unassigned, U.S.A.; JOSEPH LEES, 1st Sergeant, Infantry, U.S.A., Retired; JOHN MCWILLIAMS, 1st Sergeant, Infantry, U.S.A., Retired; WILLIAM G. PALMS, Sergeant, Infantry, Unassigned, U.S.A.

COURSES

No.	Title	Credits	Prerequisite courses
	Introductory Courses		
1	First-Year Basic Course R.O.T.C.	None	None[1]
2a	Second-Year Basic Course R.O.T.C., Infantry	None	1
2b	Second-Year Basic Course R.O.T.C., Coast Artillery	None	1
2c	Second-Year Basic Course R.O.T.C., Signal Corps	None	1

[1] Must be legally eligible for enrollment in Reserve Officers' Training Corps.

No.	Title	Credits	Offered to	Prerequisite courses
	Advanced Courses			
3a	First-Year Advanced Course R.O.T.C., Infantry.....			2a
3b	First-Year Advanced Course R.O.T.C., Coast Artillery..			2b
3c	First-Year Advanced Course R.O.T.C., Signal Corps....			2c
4a	Second-Year Advanced Course R.O.T.C., Infantry.....			3a
4b	Second-Year Advanced Course R.O.T.C., Coast Artillery.			3b
4c	Second-Year Advanced Course R.O.T.C., Signal Corps....			3c

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARLYLE M. SCOTT; Assistant Professor DONALD N. FERGUSON; Instructors ABE PEPINSKY, GERTRUDE REEVES.

General statement.—Credit is offered to seniors and juniors in the College of Agriculture, Forestry, and Home Economics, who may wish to elect work in the Department of Music. Nine credits may be obtained.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
14f-15w-16s	History of Music.....	9[2]	Soph., jr., sr.	None
17f-18w-19s	Appreciation of Music.....	3[2]	Jr., sr.	None
51f-52w-53s[1]	Violin	6-12[2]	Jr., sr.	None
91f-92w-93s[1]	Orchestra	3[2]	Jr., sr.	See statement
97f-98w-99s	Choir	3	Jr., sr.	None

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] Given at University Farm.

[2] The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

14f-15w-16s. HISTORY OF MUSIC. Some account of primitive systems and of the early Christian modal and harmonic development, leading to a general survey of musical literature from Bach to the present time. FERGUSON.

17f-18w-19s. APPRECIATION OF MUSIC. A non-technical course. REEVES.

51f-52w-53s. VIOLIN. Candidate must be able to play the first ten of Kreutzer's forty etudes, and the easier Handel and Mozart sonatas. PEPINSKY.

91f-92w-93s. ORCHESTRA. PEPINSKY.

97f-98w-99s. CHOIR. SCOTT.

PHYSICAL EDUCATION

FOR MEN

Director LOUIS J. COOKE; Assistant Director WILLIAM K. FOSTER; Instructors EDWIN S. BROWN, PERCY C. GLIDDEN, D. C. MITCHELL, CARL B. ROEMER; Assistants FRANK GILMAN, HARRY GOLDIE.

General statement.—The purpose of the department is to provide all men of the University opportunity for exercise in order to maintain and build up their general health. It also provides special training for the correction of physical defects and functional derangements.

A physical examination is required of all new matriculants, and of all others using the department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate. Students taking the required work in physical education are examined at the close of the year. A study of these records shows a marked improvement in the standard of health of the average student during his college course.

The gymnasium, swimming-pool, and baths are open to all students of the University, who are free to use the apparatus and to pursue a course in physical training under the supervision of the director and his assistants.

Those students taking the required course in physical education, who can not swim must make a reasonable effort, as determined by the department, to pass the swimming and life-saving requirements, and will be assigned special hours for instruction.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s	Personal Hygiene.....	1	Fr.	None
2f-3w[1]-4s	Gymnasium and Swimming..	None	Fr.	None
5f-6w-7s	Advanced Leaders.....	3[2]	Soph., jr., sr.	Instructor's permission
8f-9w-10s	Corrective Gymnastics.....	None	All	None
11w-12s[3]	Wrestling	None	All	Instructor's permission
13f-14w-15s[3]	Intermediate Swimming.....	None	All	Instructor's permission
16f-17w-18s[3]	Advanced Swimming.....	None	All	Instructor's permission
19w-20s[3]	Boxing	None	Fr.	None
21f-22w-23s[3]	Intramural Athletics.....	None	All	None

[1] Given at University Farm.

[2] Full course must be completed before credit is allowed.

[3] Students who meet all the requirements of Course 2 and show special ability may elect these courses instead of Course 2.

COURSES

1f,w,s PERSONAL HYGIENE. Two hours per week; first six weeks of each quarter. Examination at close of course. Four hours per week collateral work with themes. COOKE, BROWN, FOSTER.

2f-3w-4s. GYMNASIUM AND SWIMMING. Two hours a week for the winter quarter. Required qualifications in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus. FOSTER, GLIDDEN, MITCHELL, ROEMER.

5f-6w-7s. ADVANCED LEADERS. Three hours a week. FOSTER.

8f-9w-10s. CORRECTIVE GYMNASTICS. Three to six hours a week instead of regular gymnasium or military drill in case of physical disability. BROWN.

11w-12s. WRESTLING. Three times per week. Students admitted by special assignment.

13f-14w-15s. INTERMEDIATE SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. GLIDDEN.

16f-17w-18s. ADVANCED SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. GLIDDEN.

19w-20s. BOXING. By special arrangement a few students may be accommodated in this class which meets twice per week. GOLDIE.

21f-22w-23s. INTRAMURAL ATHLETICS. Competitive games in the various athletic leagues in football, basket-ball, hockey, track, and field events, baseball, tennis, swimming, handball, bowling, etc. FOSTER.

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY A. ERIKSON, ANTHONY ZELENY; Professorial Lecturer LOUALLEN F. MILLER; Instructor JOSEPH VALASEK.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
21f,w,s,su	Elements of Mechanics.....	3	All	Trigonometry
22f,w,s,su	Elements of Mechanics Laboratory	1	All	21 or parallel
31f	Acoustics	3	All	None
41w	Heat	3	All	21
42w	Heat Laboratory.....	1	All	22, 41 or parallel
51f	Light	3	All	21
52f	Light Laboratory.....	1	All	22, 51 or parallel
61s	Magnetism and Electricity...	3	All	21
62s	Magnetism and Electricity Laboratory	1	All	22, 61 or parallel

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSES

21f,w,s,su. ELEMENTS OF MECHANICS AND SOUND. Mechanics of solids, fluids, wave motion, and sound. A study of the simpler fundamental principles. First part of a general Course 21, 41, 51, 61. Course 22 should be taken in conjunction with this course. ERIKSON.

22f,w,s,su. ELEMENTS OF MECHANICS LABORATORY. Measurements in the mechanics of solids, fluids, and wave motion; the laboratory part supplementing Course 21. ERIKSON.

31f. ACOUSTICS. A study of the fundamental principles of sound. A course designed primarily for the students in the Department of Music. Open also to other students. ERIKSON.

41w. HEAT. A study of the principles underlying heat phenomena. Course 42 should be taken in conjunction with this course. MILLER.

42w. HEAT LABORATORY. The laboratory part supplementing Course 41. MILLER.

51f. LIGHT. A study of the principles underlying light phenomena. Course 52 should be taken in conjunction with this course. VALASEK.

52f. LIGHT LABORATORY. The laboratory part supplementing Course 51. VALASEK.

61s. MAGNETISM AND ELECTRICITY. A study of the principles underlying magnetic and electric phenomena. Course 62 should be taken in conjunction with this course. ZELENY.

62s. MAGNETISM AND ELECTRICITY. The laboratory part supplementing Course 61. ZELENY.

PLANT PATHOLOGY AND BOTANY

Professors EDWARD M. FREEMAN, ELVIN C. STAKMAN; Instructors HENRY D. BARKER, ALVIN H. LARSON, GAIL F. PUTTICK; Extension Specialist FRANK FROLIK.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f-su	Plant Pathology	5	Jr., sr.	Bot. 10 cred.
6s	Plant Pest Control	3	Jr., sr.	1, Ent. 3
7w-8s	Weeds and Grasses	6	Soph., jr., sr.	Bot. 10 cred.
9f,su	Weeds and Seed-Testing	3	Soph., jr., sr.	Bot. 10 cred.
10s	Forest Pathology	5	Soph., jr., sr.	Bot. 10 cred.
12w	Seed Problems	3	Jr., sr.	9
14s	Plant Disease Control	5	Jr., sr.	1, Ent. 1 or 3

No.	Title	Credits	Offered to	Prerequisite courses
	Advanced Courses			
105f-106w-107s	Mycology	9	Jr., sr.	Bot. 7, 11 or equiv.
108f-109w	Methods	6	Jr., sr.	1, Bact. 1
110s	Principles of Pathology	3	Jr., sr.	1, Bact. 1
111w,su	Diseases of Field Crops	3	Jr., sr.	1
112s,su	Diseases of Fruit and Vegetable Crops	3	Jr., sr.	1

INTRODUCTORY COURSES

1f,su. PLANT PATHOLOGY. Elementary study of plant diseases due to fungi, bacteria, and slime molds; life histories and preventive methods. Lectures, laboratory, and reference. Not open to those who have completed 10. STAKMAN, PUTTICK.

6s. PLANT PEST CONTROL. The theory and practice of control of insect and fungous pests of crop plants. Practical applications. Same as Entomology 16. Not open to those who have completed 14. PUTTICK.

7w-8s. WEEDS AND GRASSES. Agricultural and applied botanical study of weeds and grasses with special reference to agricultural importance. LARSON.

9f,su. WEEDS AND SEED-TESTING. Detailed study of seed-testing methods and seed legislation. Weed and crop seeds and weed plants studied with special reference to identification. LARSON.

10s. FOREST PATHOLOGY. Elementary study of plant diseases due to fungi, bacteria, and slime molds; life histories and preventive methods. Lectures, laboratory, and reference. Not open to those who have completed 1. (Offered in alternate years. Given in 1920–21.) STAKMAN, PUTTICK.

12w. SEED PROBLEMS. Special seed problems are assigned. Advanced work in seed-testing methods. LARSON.

14s. PLANT DISEASE CONTROL. A detailed study of methods of controlling diseases of plants of parasitic origin. Spray materials and spray machinery. Practical applications. Not open to those who have completed 6. (Offered in alternate years. Given in 1920-21.)

ADVANCED COURSES

105f-106w-107s. MYCOLOGY. A general study of the morphology, taxonomy, and biology of fungi. Lectures, laboratory, greenhouse, and field work. FREEMAN, STAKMAN.

108f-109w. METHODS. Plant pathological methods including mycological and bacteriological technique. Laboratory, lecture, and greenhouse work. Special problems. STAKMAN.

110s. PRINCIPLES OF PATHOLOGY. Comparative biology of plant pathogens; pathological plant anatomy; parasitism, biologic specialization, resistance, and immunity. Will be given in close coöperation with Agricultural Biochemistry Division and divisions offering work in plant breeding. STAKMAN.

111w,su. DISEASES OF FIELD CROPS. Detailed study of diseases of cereal and forage crops, including symptomology, etiology, and practical methods of control. Laboratory, lecture, and field work. STAKMAN, BARKER.

112s,su. DISEASES OF FRUIT AND VEGETABLE CROPS. Special study of diseases of fruit and vegetable crops, especially those important in Minnesota. Laboratory, lecture, and greenhouse work.

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Assistant Professor ALBERT J. LOBB.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f[1]	American Government.....	5	Soph., jr., sr.	None
7f,w	State and Local Government.	5	Soph., jr., sr.	1
28s[1]	Business Law.....	5	Jr., sr.	10 cred. in Pol. Sci. or Econ.
41s[1]	Rural Government.....	3	All	1

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] Given at University Farm.

INTRODUCTORY COURSES

1f. AMERICAN GOVERNMENT. Organization and actual workings of the national government; nature and origin of the American governmental system.

7f,w. STATE AND LOCAL GOVERNMENT. Comparison of American state governments, especially Minnesota; relation of states to the United States and to local units of government; recent experiments such as initiative and referendum, the recall and primaries; social and economic legislation. LOBB.

28s. BUSINESS LAW. A course in Business Law (arranged for students in the College of Agriculture, Forestry, and Home Economics), including contracts, agency, mortgages, conveyances, and negotiable instruments. LOBB.

41s. RURAL GOVERNMENT. The organization and functions of towns, school districts, villages, and counties; the assessment and taxation of property; road laws; and drainage. LOBB.

POULTRY HUSBANDRY

ANIMAL INDUSTRY GROUP

Professor ARTHUR C. SMITH; Extension Specialist NORTON E. CHAPMAN.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w	Poultry	3	All	None
2w	Poultry-Judging	3	All	1
4s	Incubating and Brooding	3	All	None
5s	Advanced Poultry-Judging	3	All	2

INTRODUCTORY COURSES

1f,w. POULTRY. The poultry industry; best methods of care and management of fowls, turkeys, ducks, and geese, and the most important breeds of same. SMITH.

2w. POULTRY-JUDGING. The history, standard requirements, and common defects of the leading commercial, standard breeds and varieties and determination and standard values by the score-card and comparison methods. SMITH.

4s. INCUBATING AND BROODING. Instruction and practice in incubation and brooding, selection of breeding stock and eggs for hatching, and feeding young chicks. Of practical value to teachers of agriculture and poultry raisers. SMITH.

5s. ADVANCED POULTRY-JUDGING. Practice in close selection for standard values of all different color patterns and principal types. SMITH.

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Associate Professors RICHARD M. ELLIOTT, WILLIAM S. FOSTER, HERBERT WOODROW;[1] Assistant Professors MABEL R. FERNALD, KARL S. LASHLEY, JOHN J. B. MORGAN; Instructors FRANCES E. LOWELL, PAUL T. YOUNG.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f-2w-3s	General Psychology	9	Soph., jr., sr.	None
4f-5w-6s	Introductory Laboratory Psychology	3	Soph., jr., sr.	An. biol. 10 cred. In 1920-21 physics, bot. or chem. may be substituted
8s	Applications of Psychology to Business	3	Bus., pre-bus. students	1-2

[1] On leave of absence, 1920-21.

No.	Title	Credits	Offered to	Prerequisite courses
	Advanced Courses			
101f-102w-103s	Experimental Psychology....	9	Jr., sr.	1-2-3, 4-5-6
108w-109s	Advanced General Psychology	6	Sr., grad.	101-102-103 or by permission
114w-115s	Human Behavior.....	6	Jr., sr.	1-2-3, 4-5-6 an. biol. 10 cred.
119f-120w	Animal Behavior.....	6	Jr., sr.	1-2-3, 4-5-6 an. biol. 10 cred.
121s	Neuro-Psychology	3	Jr., sr.	1-2-3, 4-5-6 an. biol. 10 cred.
125f-126w	Differential Psychology.....	6	Jr., sr.	1-2-3, 4-5-6
127w-128s	Social Psychology.....	3	Jr., sr.	1-2-3, 4-5-6
131f-132w	Child Mind.....	6	Jr., sr.	1-2-3, 4-5-6
144f-145w	Abnormal Psychology.....	6	Jr., sr.	1-2-3, 4-5-6
156w	Psychology of Advertising..	3	Jr., sr.	1-2, 8
160f	Employment Psychology.....	3	Jr., sr.	1-2, 8

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSES

1f-2w-3s. General Psychology. An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences. Two lectures, one recitation per week. Elliott.

4f-5w-6s. Introductory Laboratory Psychology. Simple experiments providing the beginner illustrative material and training in the methods of laboratory psychology. Required for all advanced courses in psychology, except 8, 156, and 160. Two laboratory hours per week. Foster.

8s. Applications of Psychology to Business. An introduction to business psychology. Business students only. Morgan.

ADVANCED COURSES

101f-102w-103s. Experimental Psychology. Experimentation in the analysis and measurements of mental phenomena. Assigned reading and reports on special topics. One lecture, four laboratory hours per week. Fernald.

108w-109s. Advanced General Psychology. A systematic presentation of the laws of the normal adult mind, based upon study of experimental results. Lectures, recitations, and reports. Young.

114w-115s. Human Behavior. An analysis from the point of view of the objective school of psychologists. Elliott.

119f-120w. Animal Behavior. The development of reaction-system in animals, with emphasis upon the application of studies of animals to the solution of general problems in physiological psychology. Lashley.

121s. NEURO-PSYCHOLOGY. Specialization of functions in the nervous system in relation to behavior. Discussion from the standpoint of psychology of current theories of integration and localization. LASHLEY.

125f-126w. DIFFERENTIAL PSYCHOLOGY. Important distinguishing characteristics (psychological) of individuals and of groups. Emphasis on experimental and statistical methods of discovering differences and of making comparisons. Each student participates in investigation of definite problems and in analysis of results. FERNALD.

127w-128s. SOCIAL PSYCHOLOGY. A study of the dependence of familiar forms of social organization and behavior upon the fundamental laws of mental activity. The adjustment of innate mental equipment of the individual to the forms of social groups. ————

131f-132w. CHILD MIND. General intelligence and special mental abilities; their development and their relation to heredity, physiological factors, education, speech defects, and delinquency. LOWELL.

144f-145w. ABNORMAL PSYCHOLOGY. A systematic review of psychopathology in relation to normal behavior. LASHLEY.

156w. PSYCHOLOGY OF ADVERTISING. Psychology as applied to advertising. Psychological analysis of advertisements followed by experimental investigation of the value in advertising of such factors as interest, attention, suggestion, and memory. MORGAN.

160f. EMPLOYMENT PSYCHOLOGY. Psychology as applied to employment problems. Standardization of the personal interview; the principles and development of test methods; personnel classification methods. Independent investigations required of each student. MORGAN.

RURAL PUBLICATIONS AND JOURNALISM

Professor WILLIAM P. KIRKWOOD; Extension Specialist EDWIN C. TORREY.

General statement.—The aim of this division is to give practical training in agricultural journalism and in agricultural publicity and bulletin writing.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
10f-11w-12s	Agricultural Journalism.....	9	Jr., sr.	13-14-15, 16-17
19s	Agricultural Publicity.....	3	Jr., sr.	Rhet. 19 cred. or rhet. 9 cred., Eng. 9 cred.

For additional courses in journalism see the bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSES

10f-11w-12s. AGRICULTURAL JOURNALISM. Gathering and writing agricultural news and writing articles for the agricultural press and other class papers; farm paper editing. Lectures and practical work. KIRKWOOD.

19s. AGRICULTURAL PUBLICITY. Mediums and methods through which information may be brought to attention of communities and people of the open country. KIRKWOOD.

RHETORIC.

Assistant Professors ROBERT C. LANSING, HARRY J. BURTIS; Instructors LIONEL CROCKER, RUTH MOHL.

General statement.—Rhetoric credits will not be granted officially until the close of the second quarter of the senior year.

Any instructor who finds that a student is deficient in English will submit the name of the student together with the evidence to the chairman of the Students' Work Committee. If the evidence warrants, the committee will send the student to the Section of Rhetoric for such additional work in English as is needed. This work the student must take, without credit, to validate his freshman and sophomore rhetoric credits.

Students whose work in the rhetoric courses shows at any time an inadequate knowledge of the conventions of English will be required to drop the course and enter a class in elementary rhetoric. These students will be required to complete 22 credit hours in rhetoric.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s	Rhetoric I	3	All	None
2f,w,s	Rhetoric II	3	All	1
3w,s	Rhetoric III	3	All	2
4f,w,s	Elementary Rhetoric	3	All	None
11f,w,s	Argumentation	5	Soph., jr., sr.	3
22f,w,s	Public Speaking	5	Soph., jr., sr.	3
24f,w,s	Advanced Public Speaking	3	Soph., jr., sr.	22

INTRODUCTORY COURSES

1f,w,s. RHETORIC I. Note-taking, gathering and organizing material, oral and written exposition, paragraph structure, supplementary reading. LANSING, CROCKER, MOHL.

2f,w,s. RHETORIC II. Sentence structure, diction, exposition, supplementary reading. LANSING, CROCKER, MOHL.

3w,s. RHETORIC III. Description, narration, supplementary reading. LANSING, CROCKER, MOHL.

4f,w,s. ELEMENTARY RHETORIC. Elementary grammatical and rhetorical principles. MOHL.

11f,w,s. ARGUMENTATION. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating. LANSING, BURTIS, MOHL.

22f,w,s. PUBLIC SPEAKING. A practical course in fundamentals of speech-making. Rules of order and practice in conducting assemblies included. BURTIS.

24f,w,s. ADVANCED PUBLIC SPEAKING. A course in preparing and delivering occasional addresses and informal lectures. BURTIS.

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors EVERETT W. OLMSTED, COLBERT SEARLES; Associate Professors RALPH E. HOUSE, RUTH S. PHELPS; Assistant Professors FRANCIS B. BARTON, JULES F. FRELIN, EDWARD H. SIRICH, PEDRO HENRÍQUEZ UREÑA; Professorial Lecturer ANTONIO HERAS; Instructors SOLOMON M. DELSON, CHARLES B. DRAKE, MARGUERITE GUINOTTE, SAMUEL VASCONCELOS, GUSTAVE VAN ROOSBROECK.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s-2w,s,f	Beginning French.....	10[1]	All	None
3f,w,s-4w,s,f	Intermediate French.....	10	All	1-2 or 2 yrs. H.S.
20f,s	Oral and Written French....	5	All	3-4 or 3 yrs. H.S.
21f-22w-23s	Survey of French Literature	9[1]	All	3-4 or 3 yrs. H.S.
50f-51w-52s	French Conversation.....	3[1,2]	Jr., sr.	3-4 or 3 yrs. H.S.
53f-54w-55s	French Composition.....	3[1,2]	Jr., sr.	3-4 or 3 yrs. H.S.
1f,w,s-2w,s,f	Beginning Spanish.....	10[1]	All	None
3f,w,s-4w,s,f	Intermediate Spanish.....	10	All	1-2 or 2 yrs. H.S.
20f,s	Oral and Written Spanish...	5	All	3-4 or 3 yrs. H.S.
50f-51w-52s	Spanish Conversation.....	3[1,2]	Jr., sr.	3-4 or 3 yrs. H.S.
53f-54w-55s	Spanish Composition.....	3[1,2]	Jr., sr.	3-4 or 3 yrs. H.S.
65f-66w-67s	Survey of Spanish Literature	9[1]	Jr., sr.	3-4 or 3 yrs. H.S.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] The full course must be completed before credit will be allowed.

[2] Open without petition to sophomores who can satisfy the requirements.

INTRODUCTORY COURSES

1f,w,s-2w,s,f. BEGINNING FRENCH. Pronunciation, grammar, oral exercises, translation. FRELIN, DELSON, GUINOTTE.

3f,w,s-4w,s,f. INTERMEDIATE FRENCH. Review of grammar, connected prose composition, conversation, and reading of representative authors. FRELIN, GUINOTTE.

20f,s. ORAL AND WRITTEN FRENCH. Practical French conversation and composition. BARTON.

21f-22w-23s. SURVEY OF FRENCH LITERATURE. This course will outline the history of French literature from 1600 to present day, and is prerequisite for the courses devoted to special periods. Representative texts will be read. PHELPS, SEARLES, VAN ROOSBROECK.

50f-51w-52s. ELEMENTARY FRENCH CONVERSATION. A small amount of outside preparation will be required. BARTON, FRELIN, GUINOTTE.

53f-54w-55s. ELEMENTARY FRENCH COMPOSITION. BARTON, FRELIN, GUINOTTE.

1f,w,s-2w,s,f. BEGINNING SPANISH. Pronunciation, grammar, oral exercises and translation. OLMSTED, DRAKE, VASCONCELOS.

3f,w,s-4w,s,f. INTERMEDIATE SPANISH. Review of grammar, conversation, connected prose composition, and reading of representative authors. HOUSE, VASCONCELOS.

20f,s. ORAL AND WRITTEN SPANISH. Practical Spanish conversation and composition. DRAKE.

50f-51w-52s. SPANISH CONVERSATION. A small amount of outside preparation will be required. HERAS.

53f-54w-55s. SPANISH COMPOSITION. HERAS.

65f-66w-67s. SURVEY OF SPANISH LITERATURE. An outline of the history of Spanish literature from 1500 to the present day, based upon texts and collateral reading. Prerequisite for courses devoted to special periods. HOUSE.

SOCIOLOGY AND SOCIAL WORK

Professor ARTHUR J. TODD;[1] Acting Chairman FRANK J. BRUNO; Associate Professors LUTHER L. BERNARD, MANUEL C. ELMER; Assistant Professors ROSS L. FINNEY, GUSTAV A. LUNDQUIST; Instructors LOUIS A. BOETTIGER, CHARLES E. LIVELY; Teaching Fellow ANDREW N. WRAY.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s	Introduction to Sociology....	3 or 5[2]	Soph., jr., sr.	None
6f,w,s	Modern Social Reform Movements	3	Soph., jr., sr.	1
14f,w,s	Rural Sociology.....	3	Soph., jr., sr.	1[3]
	Advanced Courses			
114s	Rural Social Institutions....	3	Jr., sr.	Soc. 10 cred. or 10 cred. in Soc. and Pol. Sci., Econ. or Psych.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] On leave of absence 1920-21.

[2] Offered as a three-credit course at University Farm, fall and spring quarters. Open only to students in Agriculture, Forestry, and Home Economics.

[3] No prerequisite for seniors in the College of Agriculture, Forestry, and Home Economics.

INTRODUCTORY COURSES

1f,w,s. INTRODUCTION TO SOCIOLOGY. A study of the origin and development of human societies; various agencies which have determined the type of social life; social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. BERNARD, ELMER, FINNEY, LUNDQUIST, BOETTIGER, LIVELY, WRAY.

6f,w,s. MODERN SOCIAL REFORM MOVEMENTS. A survey of attempts to overcome certain social maladjustments: child labor, the city, bad housing, poverty, degeneracy; movements for public health, industrial democracy, social insurance, protection of infancy and youth, public recreation, etc. ELMER, FINNEY, BOETTIGER, LIVELY.

14f,w,s. RURAL SOCIOLOGY. The background and evolution of country life; rural conveniences, communication, coöperation; rural social institutions, especially the family, school, church and social center; rural leadership, surveys, organization, social agencies. BERNARD, LUNDQUIST, LIVELY.

ADVANCED COURSES

114s. RURAL SOCIAL INSTITUTIONS. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. Lectures, discussion, reports. LUNDQUIST.

SOILS

Professor FREDERICK J. ALWAY; Assistant Professor CLAYTON O. ROST; Instructor PAUL R. MCMILLER; Extension Specialist GEORGE H. NESOM.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
2f,w	Elementary Soils	2	All	None
3s	Soils	3	Jr., sr.	Chem. 10 cred.
	Advanced Courses			
101f	Chemical Analysis of Soils	5	Sr.	3 Quant. Anal.
102f,w,s	Special Problems in Soils	[1]	Sr.	101, 103
103w	Mechanical Analysis of Soils	3	Jr., sr.	3
104s	Soil-Surveying	3	Jr., sr.	3, 103
105w	Minnesota Soils	3	Sr.	3

[1] Credit according to the amount of work.

INTRODUCTORY COURSES

2f,w. ELEMENTARY SOILS. An elementary study of the properties of soils as related to crop production. ROST.

3s. SOILS. Formation, physical properties, and chemical composition of soils; micro-organisms of the soil; farm manures, green manures, commercial fertilizers, and soil amendments; causes of unproductivity. Lectures, recitations, laboratory, and field work. ALWAY, ROST.

ADVANCED COURSES

101f. CHEMICAL ANALYSIS OF SOILS. A laboratory course on the chemical examination of soils, including both fusion and extraction methods for mineral nutrients. ROST.

102f,w,s. SPECIAL PROBLEMS IN SOILS. Individual laboratory or field work upon some special soil problem in soil physics, soil chemistry, or soil management. Arrangement must be made in advance. ALWAY.

103w. MECHANICAL ANALYSIS OF SOILS. A laboratory course on the beaker, and centrifuge methods of mechanical analysis. MCMILLER.

104s. SOIL-SURVEYING. Field practice in surveying soils and the preparation of soil maps. MCMILLER.

105w. MINNESOTA SOILS. Detailed study of the soils of Minnesota. Origin, formation, and classification; physical and chemical characteristics; moisture relations; response to manures, fertilizers, and soil amendments; naturally unproductive types and their reclamation. Lectures, laboratory, and field work. ALWAY.

VETERINARY MEDICINE

ANIMAL INDUSTRY GROUP

Professors CLIFFORD P. FITCH, WILLARD L. BOYD, MYRON H. REYNOLDS; Assistant Professor HOWARD C. H. KERNKAMP; Instructors WILLIAM A. BILLINGS, EARL A. HEWITT.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
2f	Anatomy of Domestic Animals	5	Soph., jr., sr.	None
3w-4s	Comparative Physiology	6	Soph., jr., sr.	2
6f	Physiology and Hygiene of Breeding	3	Jr., sr.	3-4
8s	Veterinary Studies	5	Soph., jr., sr.	None
12w	Infectious Diseases	3	Jr., sr.	3-4, Bact. 1
13s	Non-infectious Diseases	3	Jr., sr.	3-4
	Advanced Courses			
101w-102s	Advanced Anatomy of Domestic Animals	6	Jr., sr.	2 or equiv.
103f-104w	Advanced Comparative Physiology	6	Jr., sr.	3-4 or equiv.

INTRODUCTORY COURSES

2f. ANATOMY OF DOMESTIC ANIMALS. Anatomy of the common farm animals with special reference to bones, muscles, and viscera. Lectures and demonstrations. KERNKAMP.

3w-4s. COMPARATIVE PHYSIOLOGY. A recitation and lecture course in physiology with special reference to the physiology of domesticated animals. Special emphasis is given to digestion and metabolism. HEWITT.

6f. PHYSIOLOGY AND HYGIENE OF BREEDING. Anatomy and physiology of reproduction. Embryology, obstetrics, sterility, hygiene, and common diseases of breeding animals. BOYD.

8s. VETERINARY STUDIES. Study of diseases; causes, prevention, treatment of common diseases; simple surgical operations; lameness and unsoundness; common medicines. Planned especially for students taking only one quarter veterinary work. Not open to those who have completed 12–13. REYNOLDS.

12w. INFECTIOUS DISEASES. Etiology, morbid anatomy, symptomatology, diagnosis, prevention, and the basis of treatment of the common infectious diseases of animals. Special instruction will be given in preparation and use of vaccines, bacterins, serums, and anti-toxins. Those who have completed Course 8 can obtain only half credit for this course. FITCH, BILLINGS.

13s. NON-INFECTIOUS DISEASES. General principles of diagnosis, causes, morbid anatomy, symptomatology, prevention, and the basis of treatment of the non-infectious diseases of animals. Those who have completed Course 8 can obtain only half credit for this course. BOYD.

ADVANCED COURSES

101w-102s. ADVANCED ANATOMY OF DOMESTIC ANIMALS. Advanced study of the structures involved in the type, conformation and nutrition of the common farm animals. Dissection of farm animals, including a study of the osseous, muscular, and other principal anatomical structures. KERNKAMP.

103f-104w. ADVANCED COMPARATIVE PHYSIOLOGY. An advanced course in physiology of the domestic animals, including laboratory work with special emphasis on animal nutrition. HEWITT.

INDEX

The Bulletin *of the* University *of* Minnesota

The College of Agriculture, Forestry, and Home Economics

Announcement of Courses in Forestry for the Year 1920-1921

Vol. XXIII No. 30 July 23 1920

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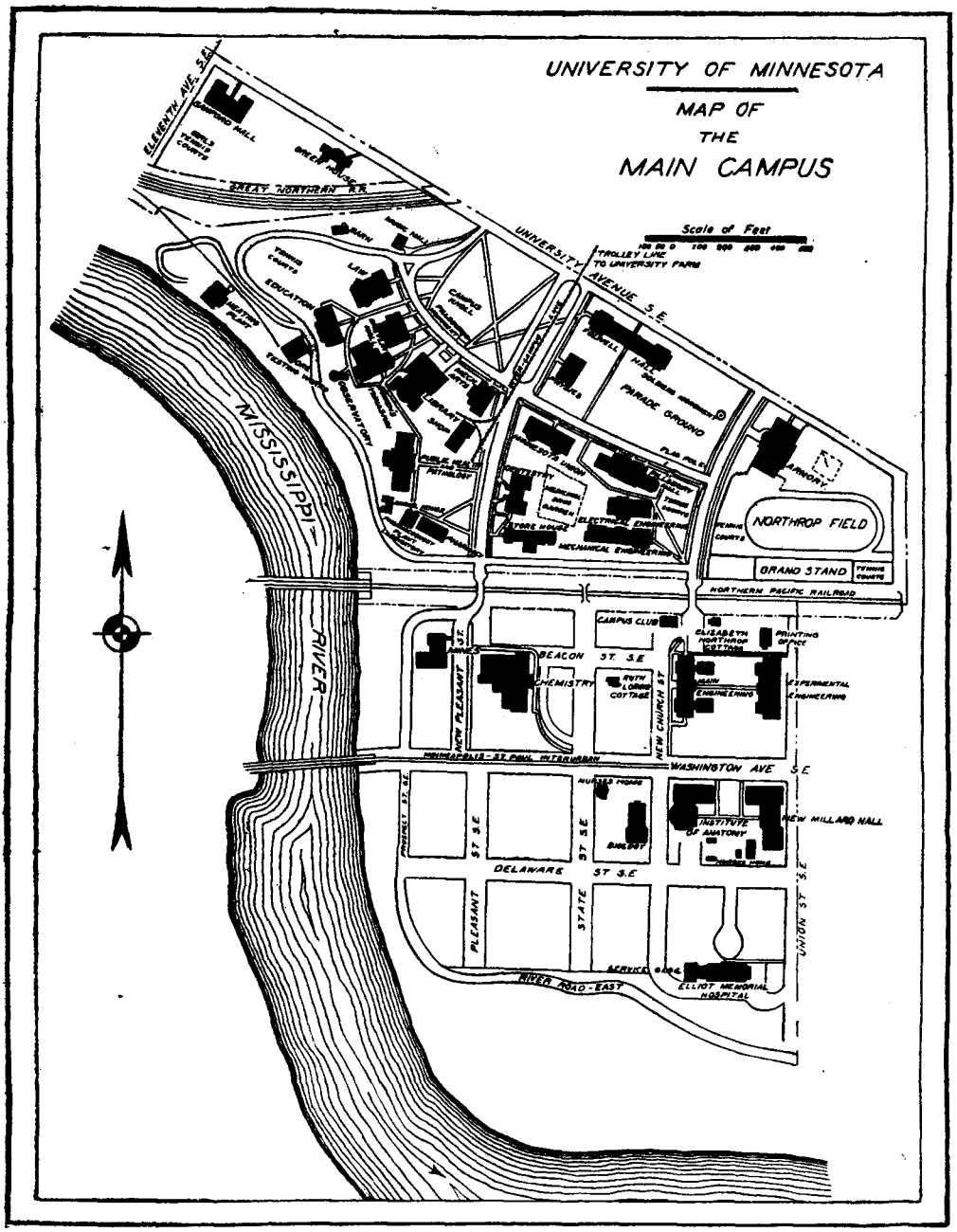
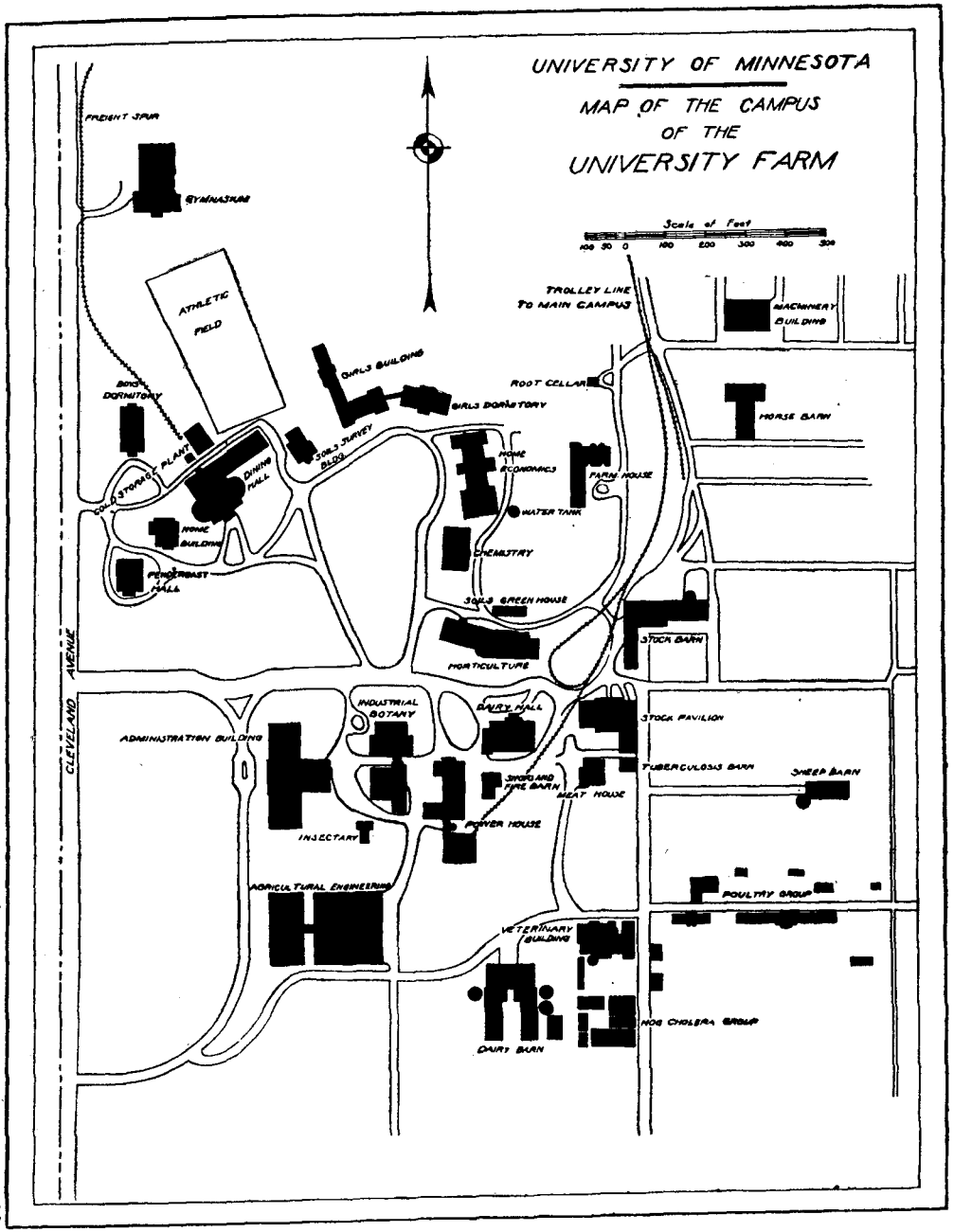


Area of Main Campus, 108.5 acres



Area of University Farm, 422.56 acres

1920

JULY

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AUGUST

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SEPTEMBER

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NOVEMBER

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1921

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APRIL

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MAY

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JULY

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AUGUST

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SEPTEMBER

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NOVEMBER

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DECEMBER

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18	19	20	21	22	23	24
25	26	27	28	29	30	31
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CALENDAR

1920-1921

1920			
September	15	Wednesday	Registration closes except for new students
September	21-28	Week	Examinations for removal of winter and spring quarter conditions and entrance examinations Registration of new students. Payment of fees
September	29	Wednesday	Fall quarter begins, 8:15 a.m.
October	4	Monday	School of Agriculture, first term begins
October	15	Friday	Half holiday, annual freshman-sophomore contest
October	21	Thursday	Senate meeting, 4:30 p.m.
October	29	Friday	Last day for removal of spring quarter incompletes
November	2	Tuesday	Election Day; a holiday
November	15-27		Advanced Creamery Operators' Short Course
November December	15 1		Advanced Cheese-Makers' Short Course
November	25	Thursday	Thanksgiving Day; a holiday
November December	29 4	Week	Ice-Cream Makers' Short Course
December	6-11	Week	Milk Plant Operators' Short Course
December	16	Thursday	Senate meeting, 4:30 p.m.
December	21	Tuesday	Last day for winter quarter registration except for new students
December	22	Wednesday	Fall quarter closes, 5:20 p.m. School of Agriculture, first term closes Christmas vacation begins, 5:20 p.m.
December January	27 3	Week	Registration of new students. Payment of winter quarter fees
1921			
January	3-8	Week	Farmers' and Home-Makers' Week Short Course
January February	3 12		Beginning Creamery Operators' Short Course
January	3-8		Threshermen's Short Course
January	3-8		Traction Engineering Short Course
January	4	Tuesday	Winter quarter begins, 8:15 a.m.
January	10	Monday	School of Agriculture, second term begins

February	1	Tuesday	Last day for removal of fall quarter incompletes
February	12	Saturday	Lincoln's Birthday; a holiday
February	17	Thursday	Senate meeting, 4:30 p.m.
February	22	Tuesday	Washington's Birthday; a holiday
March	16	Wednesday	Last day for spring quarter registration except for new students
March	24	Thursday	Winter quarter closes, 5:20 p.m. Spring vacation begins
March	24-29	Week	Registration of new students. Payment of spring quarter fees
March	30	Wednesday	Spring quarter begins, 8:15 a.m. School of Agriculture, second term closes
April	4-9		Boys' and Girls' Week Short Course
April	27	Wednesday	Last day for removal of winter quarter incompletes
May	19	Thursday	Senate meeting, 4:30 p.m.
May	30	Monday	Memorial Day; a holiday
June	12	Sunday	Baccalaureate service
June	14	Tuesday	Spring quarter closes
June	15	Wednesday	Forty-ninth annual commencement
June	17-18		Summer session registration. Payment of fees
June	20	Monday	Summer session begins
July	30	Saturday	Summer session closes

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

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FRANCIS JAGER, Professor of Bee Culture
JOSEPH R. KEITHLEY, M.S.A., Professor of Dairy Husbandry
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HOWARD C. H. KERNKAMP, D.V.M., Assistant Professor of Veterinary Medicine
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ARTHUR G. RUGGLES, M.A., Professor of Entomology
ARTHUR C. SMITH, B.S., Professor of Poultry Husbandry
ELVIN C. STAKMAN, Ph.D., Professor of Plant Pathology

[1] On leave of absence, 1920-21.

ASHLEY V. STORM, Ph.D., Professor of Agricultural Education
HARVEY G. THOMAS, First Lieutenant, U.S.A., Assistant Professor of Military Science and Tactics
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NOLA TREAT, B.S., Assistant Professor of Institutional Management
ARTHUR G. TYLER, Assistant Professor of Farm Engineering
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HALL B. WHITE, B.S. in Agr., Assistant Professor of Farm Buildings
JOHN J. WILLAMAN, Ph.D., Assistant Professor of Agricultural Analysis
HOLBROOK WORKING, M.A., Assistant Professor of Agricultural Economics
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ARTHUR L. ANDERSON, B.S., Instructor in Animal Husbandry
EDLA ANDERSON, B.S. in H.E., Instructor in Home Economics
ELIZABETH L. BACON, B.A., Instructor in Textiles and Clothing
[1]GERTRUDE M. BAKER, Instructor in Physical Education for Women
JOEL R. BAKER, Master Signal Electrician, Signal Corps, U.S.A., Instructor in Military Science and Tactics
HENRY D. BARKER, M.S., Instructor in Plant Pathology
WILLIAM A. BILLINGS, D.V.M., Instructor in Bacteriology
ALFRED BRANDT, Regimental Sergeant Major, U.S.A., Instructor in Military Science and Tactics
CARLOTTA BROWN, Instructor in Millinery
EDWIN S. BROWN, B.S., M.D., Instructor in Physical Education for Men
HENRY W. BROWN, Sergeant, Unassigned, U.S.A., Instructor in Military Science and Tactics
KENNA B. CALDWELL, Sergeant, Unassigned, U.S.A., Instructor in Military Science and Tactics
CLYDE R. CHAMBERS, M.A., Instructor in Agricultural Economics
ALICE CHILD, M.A., Instructor in Foods and Cookery
SPENCER B. CLELAND, B.S. in Agr., Instructor in Agricultural Extension
LIONEL CROCKER, B.A., Instructor in Rhetoric
LELAND L. DE FLON, B.S., Instructor in Forestry
J. GRANT DENT, Instructor in Farm Engineering
JEAN M. DORSEY, B.S. in H.E., Instructor in Foods Management
AUBREY R. DUNKUM, First Sergeant, Unassigned, U.S.A., Instructor in Military Science and Tactics
WILLIAM FINKE, First Sergeant, Unassigned, U.S.A., Instructor in Military Science and Tactics
HALLY J. FISHER, R.N., Instructor in Home Nursing

[1] On leave of absence 1920-21.

WILLIAM K. FOSTER, LL.M., Assistant Director of Gymnasium
PERCY C. GLIDDEN, Instructor in Physical Education for Men
VETTA GOLDSTEIN, Instructor in Drawing and Design
SAMUEL A. GRAHAM, M.F., Instructor in Entomology
THORWALD S. HANSEN, B.S., M.F., Instructor in Forestry
JOSEPH HAVLICEK, Regimental Commissary Sergeant, Retired, U.S.A., Instructor in Military Science and Tactics
EARL A. HEWITT, D.V.M., Instructor in Veterinary Medicine
WILLIAM L. HOGAN, First Sergeant, Unassigned, U.S.A., Instructor in Military Science and Tactics
MAURICE G. JACOBSON, Instructor in Farm Engineering
INGVALD N. JOHNSON, First Sergeant, Unassigned, U.S.A., Instructor in Military Science and Tactics
ALLEN D. JOHNSTON, Instructor in Blacksmithing
CORNELIA KENNEDY, M.S., Ph.D., Instructor in Agricultural Biochemistry
FRED A. KRANTZ, B.S., Instructor in Horticulture
VALERIA LADD, B.A., Instructor in Physical Education for Women
ALVIN H. LARSON, B.S. in Agr., Instructor in Agricultural Botany
JOSEPH LEES, First Sergeant, Retired, U.S.A., Instructor in Military Science and Tactics
RUTH M. LINDQUIST, B.S., Instructor in Foods Management
LOU LOMBARD, Instructor in Foods and Cookery
OLIVE B. MACCOMBER, Instructor in Textiles and Clothing
MABEL C. MCDOWELL, B.S., Instructor in Foods Management
PAUL R. MCMILLER, M.S., Instructor in Soils
JOHN MCWILLIAMS, First Sergeant, Retired, U.S.A., Instructor in Military Science and Tactics
D. C. MITCHELL, B.Sc. in C.E., Instructor in Physical Education for Men
RUTH MOHL, M.A., Instructor in Rhetoric
MARGARET K. MUMFORD, B.A., Instructor in Foods and Cookery
WILLIAM G. PALMS, Sergeant, Unassigned, U.S.A., Instructor in Military Science and Tactics
ABE PEPINSKY, Instructor in Violin and Director of Orchestra
ETHEL L. PHELPS, B.S., Instructor in Textiles and Clothing
GAIL F. PUTTICK, B.Sc. in Agr., Instructor in Plant Pathology
LENORE RICHARDS, B.A., Instructor in Institutional Management
CARL B. ROEMER, Instructor in Physical Education for Men
GERTRUDE B. SCHILL, B.A., Instructor in Physical Education for Women
PAUL F. SHARP, B.A., Instructor in Agricultural Biochemistry
FREDERICK H. STEINMETZ, B.S. in Agr., Instructor in Agronomy
LAVINIA STINSON, B.A., Instructor in Foods and Cookery
ALICE H. TOLG, M.D., Instructor in Physical Education for Women
GILBERT H. WIGGIN, B.S., Instructor in Forestry
CLINTON G. WORSHAM, B.S., Instructor in Farm Management
JOHN W. BUSHNELL, B.S. in Agr., Assistant in Horticulture
CHESTER DAHLE, Assistant in Dairy Husbandry

FRANK GILMAN, Assistant in Physical Education for Men
HARRY GOLDIE, Assistant in Physical Education for Men.
OTTO G. SCHAEFER, B.S. in Agr., Assistant in Dairy Husbandry
WILLIAM T. TAPLEY, B.S., Assistant in Horticulture

EXTENSION STAFF

ARCHIE D. WILSON, B.S. in Agr., Director
CLARENCE H. WELCH, Secretary, Agricultural Extension Division
MARGARET B. BAKER, Assistant State Leader, Boys' and Girls' Club Work
FRANK E. BALMER, B.S. in Agr., State Leader County Agricultural Agents
MARY L. BULL, Home Economics Specialist
WILLIAM L. CAVERT, M.S., Farm Management Specialist
NORTON E. CHAPMAN, M.A., Poultry Husbandry Specialist
FRANKLIN C. CLAPP, B.S., M.S., Assistant Farm Management Specialist
SPENCER B. CLELAND, B.S., Assistant State Leader County Agents
LUCY CORDINER, M.A., Home Economics Specialist
WILLIS J. CORWIN, B.S., Assistant State Leader County Agents
JAMES M. DREW, Assistant
THEODORE A. ERICKSON, B.A., State Leader Boys' and Girls' Club Work
FRANK FROLIK, B.S., Plant Pathology Specialist
LEWIS H. FUDGE, B.S. in Agr., Assistant State Leader Boys' and Girls' Club Work
ROY H. GIBERSON, Assistant State Leader Boys' and Girls' Club Work
GEORGE F. HOWARD, Assistant State Leader Boys' and Girls' Club Work
J. SENECA JONES, B.S., Assistant State Leader County Agents
ARTHUR J. KITTELSON, B.S., Assistant State Leader Boys' and Girls' Club Work
ARTHUR J. MCGUIRE, B.Agr., Reclamation and Livestock Specialist
ADELE KOCH, M.A., Assistant State Leader in Home Economics
WILLIAM A. MCKERROW, Livestock Specialist
ROGER S. MACKINTOSH, B.Agr., M.S. in Agr., Horticultural Specialist
JOSEPH F. MONTGOMERY, B.S. in Agr., Livestock Specialist
WILLIAM E. MORRIS, Assistant State Leader County Agents
GEORGE H. NESOM, B.A., B.S., Soil Specialist
JULIA NEWTON, B.A., State Leader in Home Economics
RETT E. OLMSTEAD, B.D., Farmers' Club Specialist
JUNIATA L. SHEPPARD, M.A., Home Economics Specialist
EDWIN C. TORREY, Specialist in Publicity Work
LESLIE V. WILSON, B.S., Dairy Specialist

MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION IN THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

FRANCIS B. BARTON, Docteur de l'Université de Paris, Assistant Professor of Romance Languages
ROY G. BLAKEY, Ph.D., Professor of Economics

[1]Thomas M. Broderick, Ph.D., Assistant Professor of Geology and Mineralogy
Oscar C. Burkhard, Ph.D., Assistant Professor of German
Frederic K. Butters, Ph.D., Associate Professor of Botany
William S. Cooper, Ph.D., Assistant Professor of Botany
[1]William W. Cumberland, Ph.D., Associate Professor of Economics
James Davies, Ph.D., Assistant Professor of German
Z. Clark Dickinson, Ph.D., Assistant Professor of Economics
George W. Dowrie, Ph.D., Professor of Economics
Elias J. Durand, B.S., Professor of Botany
William H. Emmons, Ph.D., Professor of Geology
Henry A. Erikson, Ph.D., Professor of Physics
Jules T. Frelin, B.A., Assistant Professor of Romance Languages
Frederick B. Garver, Ph.D., Associate Professor of Economics
Isaac W. Geiger, Ph.D., Assistant Professor of Chemistry
N. S. Brien Gras, Ph.D., Professor of Economic History
John H. Gray, Ph.D., Professor of Economics
Frank F. Grout, Ph.D., Professor of Geology and Mineralogy
Alvin H. Hansen, B.A., Associate Professor of Economics
Pedro Henríquez Ureña, Abogado, Ph.D., Assistant Professor of Romance Languages.
Clarence L. Holmes, M.A., Assistant Professor of Agricultural Economics
Ralph E. House, Ph.D., Associate Professor of Romance Languages
Ned L. Huff, M.A., Assistant Professor of Botany
William H. Hunter, Ph.D., Associate Professor of Chemistry
[2]Lauder W. Jones, Ph.D., Professor of Chemistry
Lee I. Knight, Ph.D., Professor of Botany
Alfred E. Koenig, M.A., Dr. Theol., Assistant Professor of German
Samuel Kroesch, Ph.D., Assistant Professor of German
Albert J. Lobb, Ph.B., LL.B., Assistant Professor of Political Science
Elmer J. Lund, Ph.D., Associate Professor of Zoology
Frank H. MacDougall, Ph.D., Associate Professor of Chemistry
Bruce D. Mudgett, B.A., Associate Professor of Economics
Walter R. Myers, Ph.D., Assistant Professor of German
Henry F. Nachtrieb, B.S., Professor of Animal Biology
Howard S. Noble, B.A., M.B.A., Assistant Professor of Economics
Everett W. Olmsted, Ph.D., Litt.D., Professor of Romance Languages
Ruth S. Phelps, M.A., Associate Professor of Romance Languages
Chessley J. Posey, M.S., Assistant Professor of Geography
Thomas S. Roberts, M.D., Professor of Ornithology
C. Otto Rosendahl, Ph.D., Professor of Botany
Thomas H. Sanders, M. of Commerce, Assistant Professor of Economics
Carl Schlenker, B.A., Professor of German
Charles F. Sidener, B.S., Professor of Chemistry
Charles P. Sigerfoos, Ph.D., Professor of Zoology

[1] On leave of absence.
[2] Resigned July 1, 1920.

EDWARD H. SIRICH, Ph.D., Assistant Professor of Romance Languages
J. WARREN STEHMAN, M.A., Assistant Professor of Economics
JOSEPHINE E. TILDEN, M.S., Professor of Botany
PEDRO HENRÍQUEZ UREÑA, Professorial Lecturer in Romance Languages
ANTHONY ZELENY, Ph.D., Professor of Physics
J. FRANKLIN EBERSOLE, Ph.B., Professorial Lecturer in Economics
ANTONIO HERAS, Bachiller, Licenciado en Derecho, Professorial Lecturer in Romance Languages
LOUALLEN F. MILLER, M.A., Professorial Lecturer in Physics
HILDING E. ANDERSON, B.A., Instructor in Agricultural Economics
JOSEPH E. CUMMINGS, M.A., Instructor in Economics
SOLOMON M. DELSON, Ph.B., Instructor in Romance Languages
LYNWOOD DOWNS, M.A., Instructor in German
CHARLES B. DRAKE, M.A., Instructor in Romance Languages
MARGUERITE GUINOTTE, Brevet Superieur Certificat d'Aptitude Pédagogique, Instructor in Romance Languages
RICHARD JENTE, Ph.D., Instructor in German
ARTHUR M. JOHNSON, Ph.D., Instructor in Botany
VICTOR H. PELZ, M.S., Instructor in Economics
ADOLPH RINGOEN, Ph.D., Instructor in Animal Biology
GEORGE M. SCHWARTZ, M.A., Instructor in Geology
ARTHUR J. TIEJE, Ph.D., Instructor in Geology
JOSEPH VALASEK, B.S., Instructor in Physics
GUSTAVE VAN ROOSBROECK, M.A., Instructor in Romance Languages
SAMUEL VASCONCELOS, B.A., LLB., Abogado, Instructor in Romance Languages
GUY H. WOOLLETT, Ph.D., Instructor in Chemistry

FACULTY COMMITTEES

1920–1921

Executive.—The Executive Committee of the Department of Agriculture
Enrollment.—WEST, BIESTER, MORROW, PIERCE, WENTLING
Curriculum.—FREEMAN, BIESTER, BOSS, CHEYNEY, FITCH, RILEY, STORM, WEIGLEY, WELLER, WEST
Students' Work.—FREEMAN, CHEYNEY, MRS. LADD, NICHOLSON, WEIGLEY, WEST
Student Organizations.—LANSING, DUTCHER, FREEMAN, MORSE, WELLER
Farm Experience.—BOSS, ALDERMAN, ECKLES
Faculty Business.—GORTNER, RUGGLES, STAKMAN, PHELPS

GENERAL INFORMATION

ADMISSION

New students are admitted at the opening of the fall, winter, and spring quarters.

All students upon entering for the first time must submit their credentials to the Enrollment Committee.

Admission is either by certificate or by examination. Candidates must have completed the equivalent of a four-year high-school course and must present:

1. Four units of English; or 3 units of English and 4 units of a foreign language, or 3 units of English and 2 units in each of two foreign languages.
2. One unit of elementary algebra and 1 unit of plane geometry.
3. Enough additional work to make in all 15 units, of which not more than 4 may be in subjects not listed in the admission groups in the general information bulletin.

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised work offered in the school course, one additional school year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

For details of admission requirements and definition of "unit" see the bulletin of general information.

All students desiring to enter the forestry courses are urged to present physics and chemistry for entrance credits.

FEES

Free tuition.—The state will pay the tuition of any student who served in the army, navy, or marine corps of the United States during any war in which the United States has been involved, including members of the National Guard or who, upon the call of the president performed military service outside the border of Minnesota in any trouble with Mexico and of any student who performed overseas service as a regularly enlisted full-time worker of the Red Cross, engaged in nursing the sick or assisting in the care of soldiers in any government hospital, field, or camp which service has been officially recognized by the national government. The amount of this free tuition is not to exceed $200 for any person and the benefits of this act will not extend beyond July 1, 1924. The amount to be paid in any year will be limited by the legislative appropriation for that year.

Any amount applied for as bonus under the state bonus law is deducted from the $200 available for tuition.

Application for this free tuition should be made to the secretary's office at the time of registration. This applies only to students, who at the time of enlistment were citizens and residents of the state of Minnesota.

Tuition includes all of the regular quarter charges listed below except the deposit and penalty fees for change of registration, late registration, condition examinations, etc.

Tuition fee (per quarter)	
Residents of Minnesota	$20.00
Non-residents	30.00
Deposit (for the year)	5.00
Health fee (per quarter)	2.00
Minnesota Union (per quarter)	.70
Post-office box (per quarter)	.20
Itasca Park regular quarter fees	
Special fees	
Examination for removal of conditions	1.00
Examination for credit (after the first quarter in residence)	5.00
Special examination	5.00
Change of registration	2.50

Late registration.—Old students must indicate their registration not later than two weeks before the day set for classes to begin. All students must complete their registration (including payment of fees) before the day set for classes to begin. Penalty for delay in either indicating or completing registration, $5. An additional dollar is charged for each day of delay after the last day set for the completion of registration, and a similar charge for each day of delay after the last day set for payment of fees.

Important.—The regulations require that no student shall be allowed to register after the quarter opens except by special committee action.

FACULTY REGULATIONS

Students are held responsible for compliance with all faculty regulations. These regulations are published in a booklet issued to students at the time of registration.

REQUIREMENTS FOR GRADUATION AND DEGREE

After the completion of the prescribed course of study, including all of the required work and the requisite amount of elective work equivalent to 204 (210 in 1921) credit hours, candidates will be recommended for graduation with the degree of Bachelor of Science.

The course of study is made up of 204* credit hours of work including:

1. Required courses, 108 to 116 credit hours, which every student must complete. These constitute approximately half of the curriculum and are considered as fundamental to any course in forestry. In most cases these will be completed in the freshman and sophomore years.

* Students graduating in June, 1921 will be required to complete 210 credit hours. The major and minor must be selected from different elective groups.

2. Elective courses, 88 to 96 credit hours, distributed as follows:
   a. A major of from 24 to 36 credit hours.
   b. A minor of 18 credit hours.
   c. Limited electives amounting to 50 per cent of the remaining number of credit hours, which must be selected outside of the groups from which the major and minor have been chosen, and
   d. Free electives, sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University.

COURSES OF STUDY

EXPLANATION OF TERMS AND COURSE NUMBERS

The quarters in which courses are offered are indicated by the letters f (fall), w (winter), s (spring), and su (summer) following the course number. For example: 5f,w,s indicates that Course 5 is given in the fall quarter and repeated in the winter and again in the spring quarter; 5f-6w indicates a two-quarter course extending through the fall and winter quarters; and 5f,w-6w,s indicates that Course 5-6 is given in the fall and winter quarters and repeated through the winter and spring quarters.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200.

Numbers following the descriptive name of a course indicate the number of credit hours.

Course numbers in parentheses following the number of credit hours indicate prerequisite courses.

Descriptions of the courses listed in the following outline of the curricula, together with those of additional courses offered as electives, will be found on pages 21-46. The divisional statements are arranged alphabetically according to the names of the divisions.

One credit hour is equivalent to (1) one lecture or recitation period requiring two hours of preparation, (2) two periods of laboratory work requiring one hour of preparation, or (3) three periods of laboratory work with no preparation, each work for one quarter.

A major is a series of courses equivalent to from 24 to 36 credit hours chosen from one of the elective groups.

A minor is a series of courses equivalent to 18 credit hours chosen from one of the elective groups.

A required course is a course required of all students for graduation, irrespective of their major sequence.

A limited elective course is an elective which may not be chosen from the same group as the major or minor.

A free elective course may be chosen from any courses offered in the University for which the student has completed the prerequisites.

REQUIRED COURSES

108 to 116 Credit Hours

All of the following work is required of every student except for the exemptions indicated. For some students this represents more than the regular amount of work of 17 credit hours per quarter. In such cases those subjects listed below which can not be taken in the freshman and sophomore years must take precedence the following year. Registration for from 15 to 18 credit hours of work each quarter, summer quarter at Itasca Park, 11 credit hours, will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.

Freshman lectures. A course of nine lectures intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter. Must be taken in the freshman year.

Military drill. Three hours per week throughout the freshman and sophomore years. Students found to be physically unfit may be required to substitute corrective exercises in gymnasium.

Physical education 3w. Gymnasium and swimming. Two hours per week for one quarter. Must be taken in the freshman year.

2. *General courses.* The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.

An. Biol. 1f,w,s-2w,s,su, General Zoology, 10 (sophomore year)

Bot. 1f,w-2w,f, General Botany, 10. Students entering college with a year of high-school botany satisfactory to the department may omit Bot. 1 (see footnote on page 22) and substitute 5 credits elective later in their course of study.

Bot. 7s, Taxonomy of Flowering Plants, 5 (Bot. 2)

Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high-school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry successfully Chem. 9-10 will be allowed not more than 10 credits.

Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. Those required to take Chem. 1-2-3 are exempt.

Econ. 5f,w, General Economics, 5

Ent. 5f, Elementary Forest Entomology, 3

Farm Eng. 3f,s, Mechanical Drawing, 3

Farm Eng. 11f,w, Applied Mathematics, 5

For. 1f,s, General Forestry, 4

For. 41f, Sylvics, 3 (For. 1, 3, 4, Bot. 2)

For. 2su, Elementary Dendrology, 3 (Itasca Park)

For. 3f, Dendrology I, 4 (Bot. 1)

For. 4w, Dendrology II, 4 (For. 3)

For. 5su, Elementary Sylviculture, 3 (Itasca Park)

For. 9su, Elementary Mensuration, 5 (Itasca Park)

For. 33f-34w, Wood Structure and Identification, 6 (For. 3f.4w, Bot. 1-2)

Geol. 29f, General Physiography, 3

Phys. Educ. 1f,w,s, Personal Hygiene, 1

Pl. Path. 10s, Forest Pathology, 5 (Bot. 1-2)

Pol. Sci. 1f, American Government, 5 (Not open to freshmen.)

Rhet. 1f,w,s, [1]Rhetoric I, 3

Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)

Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)

Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1.

Rhet. 11f,w,s, Argumentation, 5 (Rhet. 3)

ELECTIVE GROUPS

A. Groups from Which the Major, Minor, or Electives May be Chosen

1. *Sylviculture*

For. 43s, Sylviculture Laboratory, 3 (Itasca Park)

For. 101w, Advanced Dendrology, 3

For. 106w, Research Methods in Sylviculture, 3

Bot. 20f. Forest Ecology, 3

Bot. 52f, Plant Physiology, 5

Bot. 133s, Forest Geography, 5

Bot. 141f-142w-143s, Advanced Plant Physiology, 15

[1] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 44.

Bot. 131f, Field Ecology, 3
Bot. 113f-114w-115s, Advanced Taxonomy, 9
For. 26f,w, Tree Crops, 1
For. 27w, Groves and Windbreaks, 3
For. 35w, Seeding and Planting, 3
2. *Forest Organization and Management*
For. 10w, Mensuration, 5
For. 11f, Forest Valuation, 5
For. 36w, Forest Policy and Administration, 5
For. 28w, Logging, 3
For. 31s, Logging Plans, 3
For. 45s, Forest Regulation, 3
For. 20w, Grazing, 3
For. 32w, Lumber Distribution, 5
Farm Eng. 18s, Surveying, 5
Econ. 23w, Principles of Organization and Management, 5
Econ. 25f, Principles of Accounting, 4
Pol. Sci. 28s, Business Law, 5
Econ. 54s, Corporation Finance, 3
Econ. 85f-86w, Marketing of Manufactured Products, 6
Econ. 167w, Industrial Relations
For. 46s, Forest Regulation Laboratory, 3 (Itasca Park)
3. *Forest Products*
Chem. 20w, Quantitative Chemistry, 5
For. 30s, Wood Seasoning, 3
For. 29f, Sawmills and Woodworking Machinery, 3
Chem. 35f-36w, Organic Chemistry, 10
For. 44s, Wood Pulp and Paper, 3
For. 40s, Forest By-Products, 3
For. 107f-108w-109s, Uses of Wood, 9
Chem. 11s, Qualitative Chemistry, 4
For. 39f, Wood Preservation, 3
Ent. 6w, Insects of Forest Products, 3
For. 23su, Factory Experience, 5
4. *Forest Sciences*
Includes any courses offered in the fields of
Entomology and Zoology
Plant Pathology
Chemistry
Ecology

B. Groups from Which Electives Only May be Chosen

1. Courses in other Divisions of the College of Agriculture, Forestry, and Home Economics, not listed in major groups
2. Military Science and Tactics
3. Physical Education
4. Courses in departments of other schools and colleges of the University not included in major groups

ELECTIVES

Students should consult with their advisers with reference to their choice of limited and free electives.

In selecting electives, note particularly (a) prerequisites, (b) classes of students (fr., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

Registration for courses as electives in other colleges of the University must be in conformity with regulations of the college offering the course.

Elective courses in the College of Science, Literature, and the Arts, are separated into Junior College courses, open to freshmen and sophomores, and Senior College courses open to juniors and seniors. In addition to satisfying other prerequisites an average grade of C must be maintained for the first two years in order to register for a Senior College elective.

DESCRIPTION OF COURSES

For explanation of course numbers and credits see page 17.

ANIMAL BIOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY F. NACHTRIEB, THOMAS S. ROBERTS, CHARLES P. SIGERFOOS; Associate Professor ELMER J. LUND; Instructor ADOLPH RINGOEN.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Course			
1f,w,s-2w,s,su	General Zoology	10[1]	All	None
	Advanced Course			
114w-115s	Ornithology	6[1]	Jr., sr.	1-2

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] The full course must be completed before credit will be allowed.

INTRODUCTORY COURSE

1f,w,s-2w,s,su. GENERAL ZOOLOGY. A survey of the animal kingdom emphasizing the principles of development and structure in relation to function and habit, heredity and evolution, and animals of economic importance. Lectures, quizzes, and laboratory. NACHTRIEB, SIGERFOOS, LUND, RINGOEN.

ADVANCED COURSE

114w-115s. ORNITHOLOGY. The study of the structure, classification and habits of birds with special reference to birds of Minnesota. Considerable time devoted to field study. Bird or field-glasses and handbook required. Laboratory, lectures, quizzes. Class limited to 10. ROBERTS.

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors C. OTTO ROSENDAHL, ELIAS J. DURAND, LEE I. KNIGHT, JOSEPHINE E. TILDEN; Associate Professor FREDERIC K. BUTTERS; Assistant Professors WILLIAM S. COOPER, NED L. HUFF; Instructor ARTHUR M. JOHNSON.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
1f,s-2w,f	General Botany	10[1]	All	None
7s	Taxonomy of Flowering Plants	5	All	2

[1] Course 2 must be completed before credit is allowed.

No.	Title	Credits	Offered to	Prerequisite courses
11f	Algae and Fungi	5	Soph., jr., sr.	2
15w	Anatomy of Vascular Plants	5	Soph., jr., sr.	2
20f	Forest Ecology	3	Soph., jr., sr.	Bot. 15 cred. For. 4 cred.
51f	Histological Methods	3	Jr., sr.	15 credits
52f	Plant Physiology	5	Jr., sr.	15 credits
53w	Botany of Economic Plants	5	Jr., sr.	15 credits
54s	Elementary Ecology	5	Jr., sr.	15 credits
62w	Bryophytes and Pteridophytes	5	Jr., sr.	15
63s	Angiosperms and Gymnosperms	5	Jr., sr.	7 or 62
105s	Algae	5	Jr., sr.	11
107w	Bryophytes	5	Jr., sr.	7 and 62
108w	Pteridophytes	5	Jr., sr.	7 and 62
110w	Gymnosperms	5	Jr., sr.	7 and 63
113f-114w-115s	Advanced Taxonomy	9	Jr., sr.	7
118w-119s	Cytology	6	Jr., sr.	51
131f	Field Ecology	5	Sr.	54
133s	Forest Geography of North America	5	Sr.	54
141f	Advanced Plant Physiology I	5	Sr.	52, Org. Chem.
142w	Advanced Plant Physiology II	5	Sr.	52, Org. Chem.
143s	Advanced Plant Physiology III	5	Sr.	52, Org. Chem.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSES

1f,s-2w,f. GENERAL BOTANY.[1] Fundamental principles of botany. Survey of organs of the flowering plant; its internal structure and physiology. Representatives of the algae, fungi, liverworts, etc., examined with special reference to tracing evolution of the vegetable kingdom. DURAND, BUTTERS, HUFF, JOHNSON, and Assistants.

7s. TAXONOMY OF FLOWERING PLANTS. A general study of the classification and relationships of flowering plants. Laboratory and field practice in the determination of species, together with lectures and quizzes. ROSENDAHL, JOHNSON.

11f. GENERAL MORPHOLOGY OF ALGAE AND FUNGI. A general survey of the structure, evolution, and classification of the algae and fungi. Lectures, laboratory, and field work. TILDEN.

15w. ANATOMY OF VASCULAR PLANTS. A study of the microscopic structure of vascular plants, the cell, tissues, and tissue systems with particular attention to the development and evolution of the vascular system in the root, stem, and leaf. BUTTERS.

[1] Students entering college with a year of high-school botany satisfactory to the department may be admitted directly to Course 2. All such must present to the department before registration, their high-school note-book and a statement from their teacher showing the amount and proficiency of their work.

20f. FOREST ECOLOGY. A study of relations between forest trees and their environment; soil and atmospheric factors, their influence upon function, structure, and distribution; an introduction to the study of forest communities and successions. Lectures, discussion, and laboratory. COOPER.

51f. HISTOLOGICAL METHODS. Training in methods used in the preparation and preservation of class material. Special attention is given to methods of killing, imbedding, sectioning, staining, and mounting. DURAND.

52f. PLANT PHYSIOLOGY. An introductory course giving a general survey of plant functions. KNIGHT.

53w. BOTANY OF ECONOMIC PLANTS. A survey course treating the most important botanical features of the common economic plants. KNIGHT.

54s. ELEMENTARY ECOLOGY. An introduction to the study of plants and their environment; investigation of the habitat; its effects upon plants as individuals and in mass; plant communities; plant succession. Laboratory and field work, lectures and discussion. COOPER.

ADVANCED COURSES

62w. GENERAL MORPHOLOGY OF BRYOPHYTES AND PTERIDOPHYTES. A general survey of the structure, evolution, and classification of the liverworts, mosses, and ferns. HUFF.

63s. GENERAL MORPHOLOGY OF ANGIOSPERMS AND GYMNOSPERMS. A general survey of the structure, evolution, and classification of seed plants. BUTTERS.

105s. ALGAE. A study of freshwater forms, based on collections made by the class. Lectures, laboratory, and field work. TILDEN.

107w. MORPHOLOGY AND TAXONOMY OF THE BRYOPHYTES. A special study of the structure and classification of the liverworts and mosses. (Not offered in 1920-21.) DURAND.

108w. MORPHOLOGY AND TAXONOMY OF THE PTERIDOPHYTES. An intensive study of lycopods, ferns and the allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. BUTTERS.

110w. MORPHOLOGY AND TAXONOMY OF THE GYMNOSPERMS. An intensive study of cycads, conifers, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. BUTTERS.

113f-114w-115s. ADVANCED TAXONOMY. An advanced course in which special attention is given to the taxonomy of difficult natural groups, involving systematic principles and practice rules of nomenclature, systems of classification, etc. ROSENDAHL.

118w-119s. CYTOLOGY. A survey of cell structure and the various phenomena of division, fusion, and metamorphosis, together with a review of history of cytological investigation. Methods of cytological investigation. Methods of cytological research indicated in the laboratory. ROSENDAHL.

131f. FIELD ECOLOGY. A careful study of the local plant communities and successions, followed by a written report, and by a study of the general principles of plant association and succession. COOPER.

133s. FOREST GEOGRAPHY OF NORTH AMERICA. Preliminary discussion of principles of plant distribution, followed by detailed study of forest regions of North America; reading, discussion, lantern slides, distribution maps, microscopic work, written reports. COOPER.

141f. ADVANCED PLANT PHYSIOLOGY I. Physical phases of plant physiology. A course dealing with the intake of materials and their translocation, also the energy relations of the plant. KNIGHT.

142w. ADVANCED PLANT PHYSIOLOGY II. Plant metabolism. A course dealing with the synthesis of plant food, its transformation and utilization by the plant. KNIGHT.

143s. ADVANCED PLANT PHYSIOLOGY III. Plant metabolism and growth. Continuation of Course 142, also introducing certain fundamental phases of growth. KNIGHT.

CHEMISTRY

THE SCHOOL OF CHEMISTRY

Professors LAUDER W. JONES,[1] CHARLES F. SIDENER; Associate Professors WILLIAM H. HUNTER, FRANK H. MACDOUGALL; Assistant Professor ISAAC W. GEIGER; Instructor GUY H. WOOLLETT.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f-2w-3s	General Inorganic Chemistry.	12	All	None
9f-10w	Advanced General Inorganic Chemistry	10	All	H.S. chem.
11s	Qualitative Chemical Analysis	4	Soph., jr., sr.	1-2-3
12s-13f	Qualitative Chemical Analysis	10	Soph., jr., sr.	9-10
20w	Quantitative Analysis.....	5	Soph., jr., sr.	12-13
21s	Quantitative Analysis.....	5	Soph., jr., sr.	20
35f-36w	Organic Chemistry.....	10	Soph., jr., sr.	1-2-3 or 9-10
	Advanced Courses			
126s	Sanitary Water Analysis....	1 or 2	Sr.	21
140f-141w-142s	Physical Chemistry.....	9,12,or 15	Jr., sr.	Chem. 30 cred.; phys. 15 credits

For additional courses see the bulletin of the School of Chemistry.

[1] Resigned July 1, 1920.

INTRODUCTORY COURSES

1f-2w-3s. General Inorganic Chemistry. Designed for those who have had no high-school chemistry. 1-2. A study of the general laws of chemistry; the non-metals and their compounds. 3. A study of the metals and their compounds. ———

9f-10w. Advanced General Inorganic Chemistry. For those who have had one year of high-school chemistry. 9. General laws of chemistry; non-metals and their compounds. 10. The metals and their compounds and ionic equilibrium, considered quantitatively. ———

11s. Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry. ———

12s-13f. Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry. ———

20w. Qualitative Analysis. An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. Sidener, Geiger.

21s. Quantitative Analysis. Supplementary to Course 20. Further discussion of the principles and methods together with laboratory work on additional typical problems in gravimetric and volumetric analysis. Sidener, Geiger.

35f-36w. Organic Chemistry. An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. Hunter, Woollett.

ADVANCED COURSES

126s. Sanitary Water Analysis. Lectures and laboratory practice in the chemical examination of potable waters. Three hours laboratory work per week. Sidener, Geiger.

140f-141w-142s. Physical Chemistry. A general survey of the subject. Laboratory work three or six hours per week. Nine, twelve, or fifteen credits, depending on amount of laboratory work. MacDougall.

ECONOMICS

SCHOOL OF BUSINESS

Professors GEORGE W. DOWRIE, JOHN D. BLACK, ROY G. BLAKEY, N. S. BRIEN GRAS, JOHN H. GRAY; Associate Professors WILLIAM W. CUMBERLAND,[2] FREDERICK B. GARVER, ALVIN H. HANSEN, BRUCE D. MUDGETT; Assistant Professors Z. CLARK DICKINSON, CLARENCE L. HOLMES, HOWARD S. NOBLE, THOMAS H. SANDERS, J. WARREN STEHMAN, HOLBROOK WORKING; Professorial Lecturer J. FRANKLIN EBERSOLE; Instructors HILDING E. ANDERSON, CLYDE R. CHAMBERS, JOSEPH E. CUMMINGS, PAUL L. MILLER, VICTOR H. PELZ.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
5f,w[1]	General Economics	5	Soph., jr., sr.	None
6f,w,s[1]	Agricultural Economics	3	Soph., jr., sr.	3-4, or 5
13s[1]	Agricultural Statistics	5	Soph., jr., sr.	3-4, or 5 and 6, or 7
18f[1]	Problems in Agricultural Economics	3	Soph., jr., sr.	3-4, or 5 and 6, or 7
20w-21s[1]	Economic History and Geography of Agriculture	10	All	None
23w	Principles of Organization and Management	5	Soph., jr., sr.	3-4, or 5 and 6
25f-26w	Principles of Accounting	8	Soph., jr., sr.	None
28s[1]	Principles of Accounting (Agricultural)	5	Soph., jr., sr.	3-4, or 5 and 6, or 7
41s	Financial History of United States	3	Soph., jr., sr.	3-4, or 5 and 6
72f	Economics of Transportation	3	Jr., sr.	54
73w	Railway Traffic and Rates	3	Jr., sr.	3-4, or 5 and 6
74s	Water Transportation	3	Jr., sr.	3-4, or 5 and 6
85f-86w	Marketing of Manufactured Products	6	Jr., sr.	3-4, or 5 and 6, and 9 other cred.
88s	Advertising	3	Jr., sr.	85-86
89f	Marketing of Agricultural Products	5	Jr., sr.	3-4, 5 and 6, or 7
	Advanced Courses			
103f-140w	Value and Distribution	6	Jr., sr.	3-4, or 5 and 6
107f[1]	Land Economics	5	Jr., sr.	18
108w	Farm Marketing Problems	3	Jr., sr.	89
109w[1]	Economics of Consumption	3	Jr., sr.	3-4, or 5 and 6, or 7
110s-111f[1]	Practice Course in Marketing	3	Jr., sr.	89
112f-113w	Technic of Statistical Investigation	6	Jr., sr.	14
116w	Economics of Agricultural Productions	3	Jr., sr.	18
117s[1]	Prices of Farm Products	3	Jr., sr.	3-4, or 5 and 6, or 7

[1] Given at University Farm.
[2] On leave of absence, 1920-21.

No.	Title	Credits	Offered to	Prerequisite courses
121f-122w-123s	Economic History of Europe. (Not given in 1920-21)			
126f-127w-128s[1]	Special Research Problems in Agricultural Economics....	9	Jr., sr.	
131f	Cost Accounting	3	Jr., sr.	25-26
143f-144w	Money and Banking.....	10	Jr., sr.	3-4, or 5 and 6
145s	International Exchange.....	3	Jr., sr.	143-144
146w	Investments	3	Jr., sr.	54, 143-144
149s	Business Cycles	3	Sr.	143-144 and 54 or 146
150s[1]	Farm Finance.....	3	Soph., jr., sr.	3-4, or 5 and 6
154s	Public Utilities.....	3	Jr., sr.	54
161f	Labor Problems and Trade Unionism	3	Jr., sr.	3-4, or 5 and 6
166f	Employment and Personnel Management	3	Jr., sr.	3-4, or 5 and 6, and Psychol. 1-2-3 or equivalent
176f	Commercial Policies	3	Jr., sr.	3-4, or 5 and 6
177w	Foreign Trade	3	Jr., sr.	176
191f-192w	Public Finance.....	6	Jr., sr.	3-4, or 5 and 6
193s	State and Local Taxation...	3	Jr., sr.	191-192

For additional courses see bulletin of the School of Business.

[1] Given at University Farm.

INTRODUCTORY COURSES

5f,w. General Economics. The usual basic principles of economic science interpreted in terms of agriculture and forestry as well as of other industries. Holmes, Working, Miller.

6f,w,s. Agricultural Economics. The special body of economic principles that have been developed for agricultural production, exchange, and distribution, together with the application of these principles to agricultural problems. Holmes, Working.

13s. Agricultural Statistics. Statistical method applied to agricultural data. Black.

18f. Problems in Agricultural Economics. Application of the principles of agricultural economics to a number of the major agricultural problems. Each student partly chooses his own study problems. Holmes.

20w-21s. Economic History and Geography of Agriculture. (1) The evolution of modern agricultural production, tenure systems, and market distribution. (2) The forces determining past and present localization of agricultural products, types of agricultural production, and agricultural markets. Holmes, Chambers.

23w. Principles of Organization and Management. Types of operating organization; specialization; coördination of men and departments; planning; delegation of authority; means of control; establishment and maintenance of standards for materials, operations, machinery; determination of business policies; personnel problems. Pelz.

25f-26w. PRINCIPLES OF ACCOUNTING. The purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets, income accounts, and other statements; introduction to partnership and corporation accounts. Laboratory course with supplementary lectures. NOBLE and others.

28s. PRINCIPLES OF ACCOUNTING (AGRICULTURAL). Principles of general and cost accounting presented in somewhat abridged form. NOBLE, SANDERS.

41s. FINANCIAL HISTORY OF THE UNITED STATES. A study of the development of the main features of our systems of money, banking, tariffs, and public finance including a consideration of war financiering and financial cycles. BLAKEY.

72f. ECONOMICS OF TRANSPORTATION. The theory and practice of rate-making. Government regulation, the conflict between state and federal authorities, and suggested improvements in control of transportation agencies. CUMMINGS.

73w. RAILWAY TRAFFIC AND RATES. Railway transportation from standpoint of business man and shipper. Freight shipping documents. Classification and tariffs, time and preference freight, private car lines, industrial trackage and terminal service, express rates and service, special passenger rates. CUMMINGS.

74s. WATER TRANSPORTATION. History and present status of inland waterway and ocean transportation in the United States with some reference to present development in representative foreign countries. Problems peculiar to water transportation in the United States. CUMMINGS.

85f-86w. MARKETING OF MANUFACTURED PRODUCTS. Organization of distributive channels; marketing of basic raw materials and manufactured products; relations selling problems and methods of manufacturers, wholesalers, retailers, and other factors in the distributive system; price policies; price maintenance. PELZ.

88s. ADVERTISING. Planning and executing campaigns; commodity and market analysis; planning and preparation of copy; selection and use of media; trade marks; display, outdoor and direct advertising; relations of advertiser, agency, and publisher; social and economic aspects. PELZ.

89f. MARKETING OF AGRICULTURAL PRODUCTS. Study of the principles relating to the distribution of farm products; types of markets, middlemen, market organizations; costs; prices; coöperative marketing. ANDERSON.

ADVANCED COURSES

103f-104w. VALUE AND DISTRIBUTION. An advanced course in economic theory devoted chiefly to the study of recent theories of wages, interest, rent, and profits. Assigned readings and reports on current problems in distribution. GARVER.

107f. LAND ECONOMICS. A study of several problems arising out of the land basis of civilization, such as property in land, land utilization, land classification, land settlement, status of the agricultural classes, farm labor, farm ownership and tenancy. BLACK.

108w. FARM MARKETING PROBLEMS. Studies of the problems and methods of marketing selected farm products with special reference to the Twin City markets. BLACK, ANDERSON.

109w. ECONOMICS OF CONSUMPTION. Nature of human wants; standards of living; cost of living; income, administration of income; nature of demand; demand and price; relation of consumption to the population problem. BLACK.

110s-111f. PRACTICE COURSE IN MARKETING. Eight to twelve weeks of experience as an employee in central or local markets. Careful study and observation of methods. Written plans and reports. BLACK, ANDERSON.

112f-113w. TECHNIC OF STATISTICAL INVESTIGATION. Primary and secondary investigations; statistical units, preparation, filling, and editing of schdeules; classification and tabulation of returns; presentation of results. Readings, field work, and reports. MUDGETT.

116w. ECONOMICS OF AGRICULTURAL PRODUCTION. Detailed analysis of the economic principles underlying agricultural production; economic characteristics and functions of the factors of production; proper combinations of factors; selection of enterprises. HOLMES.

117s. PRICES OF FARM PRODUCTS. Price determination in the various markets for various classes of farm products; analysis of forces determining prices. BLACK, WORKING.

121f-122w-123s. ECONOMIC HISTORY OF EUROPE, 1300-1750. The chief interests are the manor; the town; the metropolis; national economic regulations; developments in agriculture, commerce, manufacture, and economic thought, leading up to the industrial revolution. (Not offered in 1920-21.) GRAS.

126f-127w-128s. SPECIAL RESEARCH PROBLEMS IN AGRICULTURAL ECONOMICS. Intensive individual research work on problems not being studied in the seminar during the quarter. BLACK, HOLMES, WORKING.

131f. COST ACCOUNTING. General principles of cost accounting; elements of cost; methods of arriving at costs and of distribution of overhead; application of cost accounting principles to selling, banking, mining, farming, etc. NOBLE.

143f-144w. MONEY AND BANKING. Relation to industrial system. Monetary principles with special reference to United States. American banking and bank organization, principles of commercial banking, non-commercial banking, relation of government to banking, comparative study of leading foreign systems. DOWRIE, STEHMAN, EBERSOLE.

145s. INTERNATIONAL EXCHANGE. Theory of international exchange, pars of exchange with gold, silver, and paper standard countries; the rates of exchange; financing imports and exports; bankers' bills; futures, arbitage; specie movements; the present foreign exchange situation. DOWRIE.

146w. INVESTMENTS. Sources of demand and supply of capital; bond houses and stock exchanges as marketing media, criteria for personal selection of prime investments; government, municipal, corporation, and real estate loans; and the use of bond tables. EBERSOLE.

149s. BUSINESS CYCLES. American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression, and financial panics. Critical examination of all the available business barometers designed to forecast similar conditions. EBERSOLE.

150s. FARM FINANCE. The financial needs of typical farmers. Present facilities for supplying them; institutions, their organization and operation, interest rates, defects, and proposed remedies. The financing of the various farm organizations. The farmer as an investor. DOWRIE.

154s. PUBLIC UTILITIES. Economic and legal bases of classification. Relative advantages of public ownership and regulation. Central and municipal regulation compared. The basis of rates; relative rates; rates and service. Summary of the theories of valuation. Gray.

161f. LABOR PROBLEMS AND TRADE UNIONISM. Origin of the labor problem; conditions of labor in American industries; structure, aims, policies, and methods of trade and industrial unionism and employers' associations; collective bargaining and shop committee; mediation and arbitration; injunctions; labor legislation. HANSEN.

166f. EMPLOYMENT AND PERSONAL MANAGEMENT. Organization and routine of emp'oyment department; selecting employees, records, follow-ups; standardization of labor requirements; problems of labor turn-over; service and welfare features, as safety, education, recreation. Practice in representative establishments. Written report. DICKINSON.

176f. COMMERCIAL POLICIES. Theory of international commerce; free trade, reciprocity, protection, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign policies, and other governmental and organized efforts to affect trade. American problems emphasized. BLAKEY.

177w. FOREIGN TRADE. Nature and methods of foreign trade. Character of the foreign trade of the United States and leading countries of the world; organization for foreign trade. BLAKEY.

191f-192w. PUBLIC FINANCE. National government revenues, expenditures, and debts. This includes a study of the principles and various forms of taxation, budgetry legislation and control, war and emergency financiering, the shifting and incidence of taxes and fiscal reforms. BLAKEY.

193s. STATE AND LOCAL TAXATION. Principles and problems, e.g., state and local taxation of lands, mineral resources, forests, corporation, incomes, inheritances: also studies of classification, separation, local option, exemption, double taxation, evasion, assessment, centralized administration. BLAKEY.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors WILLIAM A. RILEY, ARTHUR G. RUGGLES, FREDERIC L. WASHBURN; Instructor SAMUEL A. GRAHAM.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
5f	Elementary Forest Entomology...	3	Soph., jr., sr.	An. biol. 10 cred.
6w	Insects of Forest Products.....	3	Soph., jr., sr.	5
12w	Forest Zoology.....	3	Jr., sr.	An. biol. 10 cred.

For additional courses see the bulletin of the agricultural courses.

INTRODUCTORY COURSES

5f. ELEMENTARY FOREST ENTOMOLOGY. A study of the life histories and methods of controlling insects affecting shade and forest trees. Not open for credit to students majoring in field of entomology. RUGGLES, GRAHAM.

6w. INSECTS OF FOREST PRODUCTS. Treating life history, habits, and control of insects attacking dead or freshly felled wood, and forest products. GRAHAM.

12w. FOREST ZOOLOGY. Forest animals. Relation of birds and of various four-footed animals to forest protection. Habits, range, usefulness; the manner of protecting the important large and small game, fish, and birds; fish culture. Lectures and laboratory work. WASHBURN.

FARM ENGINEERING

Professor WILLIAM BOSS; Associate Professor HARRY B. ROE; Assistant Professor HALL B. WHITE; Instructors MAURICE G. JACOBSON, ALLEN D. JOHNSTON.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
3f,s	Mechanical Drawing	3	All	None
4w	Blacksmithing	3	All	None
5f	Carpentry	3	All	None
11f,w	Applied Mathematics	5	All	None
18s	Surveying	5	Jr., sr.[1]	3, 11 or equivalent

For additional courses see the bulletin of the agricultural courses.
[1] Open also to sophomores in forestry.

INTRODUCTORY COURSES

3f,s. MECHANICAL DRAWING. Materials, instruments and their uses. The conventions, lettering, scale reading, kinds of drawings, practice in cabinet projection and drawing building plans. JACOBSON.

4w. BLACKSMITHING. The management of forge and fire in bending, shaping, and welding iron. JOHNSTON.

5f. CARPENTRY. The use and care of carpentry tools. The construction of farm equipment such as hayracks, self-feeders, etc. Building construction. Painting and wood finishing. WHITE.

11f,w. APPLIED MATHEMATICS. Rules of practical mathematics with special attention to formulas and problems directly related to agricultural and forestry work; e.g., areas, volumes, percentages, proportions, variations, investments, cost problems, etc. ROE.

18s. SURVEYING. Plain surveying as applied to farm and forestry problems. Mensuration, leveling, simple grade determination, elements of topography and farm mapping. ROE.

FORESTRY

Professors EDWARD G. CHEYNEY, JOHN H. ALLISON; Associate Professor JOHN P. WENTLING; Assistant Professor WILLIAM H. KENETY; Instructors LELAND L. DEFLON, THORWALD S. HANSEN, GILBERT H. WIGGIN; Special Lecturers WILLIAM T. COX, DILLON P. TIERNEY.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,s	General Forestry	4	All	None
2su	Elementary Dendrology	3	All	None
3f	Dendrology I	4	Soph., jr., sr.	Bot. 1
4w	Dendrology II	4	Soph., jr., sr.	3
5su	Elementary Sylviculture	3	All	None
9su	Elementary Mensuration	5	All	None
10w	Forest Mensuration	5	Jr., sr.	4
11f	Forest Valuation	5	Jr., sr.	10, 41
20w	Grazing	3	Jr., sr.	None
23su	Factory Experience	5	Jr., sr.	33-34
26f,w	Tree Crops	1	All	None

No.	Title	Credits	Offered to	Prerequisite courses
27w	Groves and Windbreaks	3	All	None
28w	Logging	3	Sr.	1,4
29f	Sawmills and Woodworking Machinery	3	Jr., sr.	33-34
30s	Wood-Seasoning	3	Jr., sr.	33-34
31s	Logging Plans	3	Sr.	28
32w	Lumber Distribution	5	Jr., sr.	33-34
33f-34w	Wood Structure and Identification	6	Jr., sr.	3,4, Bot. 1-2
35w	Seeding and Planting	3	Jr., sr.	41
36w	Forest Policy and Administration	5	Sr.	43,11,28 parallel
39f	Wood Preservation	3	Jr., sr.	33-34
40s	Forest By-Products	3	Jr., sr.	None
41f	Sylvics	3	Jr., sr.	1,3,4, Bot. 2
43s	Sylviculture Laboratory	3	Jr., sr.	35
44s	Wood Pulp and Paper	3	Jr., sr.	33-34 Chem. 3 or 10
45s	Forest Regulation	3	Sr.	43,11
46s	Forest Regulation Laboratory	3	Jr.	43,11
	Advanced Courses			
101w	Advanced Dendrology	3	Jr., sr.	4, Bot. 1-2
106w	Research Methods in Sylviculture.	3	Sr.	43
107f	Uses of Wood I	3	Sr.	33-34
108w	Uses of Wood II	3	Sr.	33-34
109s	Uses of Wood III	3	Sr.	107,108

INTRODUCTORY COURSES

1f,s. General Forestry. A brief history of the development of forestry in Europe and America; its bearing on the forestry problems of the United States; description of the United States forests. Lectures and collateral reading. Cheyney.

2su. Elementary Dendrology. A full study of the trees and shrubs found in Itasca Park, with special reference to identification by means of gross characters. Wentling.

3f. Dendrology I. Comprehensive study of the forest trees of the United States; their classification, characteristics, and range, with special attention to prominent and constant characteristics. Lectures, assigned reading, special papers, field work. Wentling, DeFlon.

4w. Dendrology II. Continuation of Course 3. Wentling, DeFlon.

5su. Elementary Sylviculture. Largely field work designed to give the student a working knowledge of the forest. Includes sylvicultural study of the species found in the north woods and the general principles underlying sylvicultural reconnaissance. Wentling.

9su. Elementary Mensuration. Largely field work. Includes elementary work in timber cruising, valuation surveys, stem analysis, and the study of the measurements of stand, volume, and yield. Allison.

10w. FOREST MENSURATION. The basic principles underlying the measurement of forest products. Measurement of standing and felled timber. Special attention is given to log rules, preparation and use of volume tables, growth of trees and yield table. HANSEN.

11f. FOREST VALUATION. The business of forest management. A study of the different factors entering into the valuation of forest property. ALLISON.

20w. GRAZING. History of grazing in the West. Kinds of stock used. Forage plants. Regulations and methods of handling stock. Range management and protection. Lectures, recitations, and reading. ALLISON.

23su. FACTORY EXPERIENCE. Two or more months in a factory utilizing wood by-products such as pulp or paper mill, wood distillation or wood preservation plant.

26f,w. TREE CROPS. The part trees play in the successful development of the farm. The relation of the forests to agriculture and animal husbandry. The farm and the timber supply. CHEYNEY.

27w. GROVES AND WINDBREAKS. Trees and their relation to the farm. Planning and planting farm windbreaks and shelterbelts. Utilization and marketing of farm, grove, or woodlot products. WIGGIN.

28w. LOGGING. The practice, cost, and development of the different logging methods in use in the different forest regions of the United States, and the modifications required by forest management. Report based on personal investigations required. CHEYNEY.

29f. SAWMILL AND WOODWORKING MACHINERY. A study of sawmills, woodworking machinery, and other processes in the primary manufacture of lumber products. CHEYNEY.

30s. SEASONING OF WOOD. The theory and practice of air seasoning and kiln drying the different species of wood and the different forms of wood products; the results obtained and the defects to be avoided. CHEYNEY.

31s. LOGGING PLANS. A study of the data essential to the preparation of a logging plan for each region. Estimating costs. The organization of crews and companies. CHEYNEY.

32w. LUMBER DISTRIBUTION. The standing timber of the United States in its relation to the lumber market. The organization of the industry and the distributing agencies. CHEYNEY.

33f-34w. WOOD STRUCTURE AND IDENTIFICATION. A comprehensive study of the structure, classification, identification, and characteristics of the most important commercial domestic and foreign woods. Lectures, papers, laboratory. Record's *Economic Woods* used as a text. WENTLING.

35w. SEEDING AND PLANTING. The cultural principles, operations, methods, and equipment in nursery work and artificial regeneration. Includes seed-collecting, storing, sowing, raising seedlings, packing, transplanting field planting, packing for shipment, etc.

36w. POLICY AND ADMINISTRATION. Policy of the United States and the states toward the utilization of the public forest resources. Policy of other owners toward forest resources controlled by them. Administration of the national and state forests. ALLISON.

39f. WOOD PRESERVATION. Lectures and collateral reading upon the history, development, and methods of wood preservation. Different systems now in use and preservatives used. ALLISON.

40s. FOREST BY-PRODUCTS. A study of such special forms of wood utilization as wood distillation, the naval stores industry, the vegetable tannins obtained from trees, sugar-making, etc. ALLISON.

41f. SYLVICS. The fundamentals forming the basis of sylviculture with special attention to the sylvics of the important tree species. Lectures, reading, and required papers. WENTLING.

43s. SYLVICULTURAL LABORATORY. Nursery practice and field planting. Field investigations and planting plans. Seed collecting, extracting, and storing. Daily nursery and field work. WENTLING.

44s. WOOD PULP AND PAPER. A general study of the manufacture of wood pulp and wood pulp papers. ALLISON.

45s. FOREST REGULATION. The principles of forest regulation. The purpose and preparation of forest working plans. Includes working of the data collected in For. 46su. as well as lectures. ALLISON.

46s. FOREST REGULATION LABORATORY. Field work. The collection of the data necessary to working up a forest working plan. Includes the making of the timber estimates, growth studies, and maps necessary to a forest working plan. ALLISON.

ADVANCED COURSES

101w. ADVANCED DENDROLOGY. A continuation of Courses 3 and 4 with special studies in classification and distribution. WENTLING.

106w. RESEARCH METHODS IN SYLVICULTURE. The fundamental principles upon which sylviculture is based. Methods used at experiment stations in solving problems in forestation, protection and management. KENETY.

107f. USES OF WOOD I. A study of the economic hard and soft woods, both foreign and domestic from standpoint of regions of production, distribution centers, qualities, amounts and prices in relation to the wood-using industries. Lectures, reading, reports. WENTLING.

108w. USES OF WOOD II. A continuation of Course 107f dealing with the industries and the woods they use. Kinds, grades, qualities, properties, requirements for each product. Use, reuse, distribution of product. Regions of production and relation to other industries. Lectures, reading, reports. WENTLING.

109s. USES OF WOOD III. The actual use of wood in the industries. At least six hours per week must be spent in actual study in a factory. Complete reports and collateral reading. Open only on completion of 107 and 108. WENTLING.

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors WILLIAM H. EMMONS, FRANK F. GROUT; Assistant Professors THOMAS M. BRODERICK,[2] CHESSLEY J. POSEY; Instructors GEORGE M. SCHWARTZ, ARTHUR J. TIEJE.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,s-2w,su	General Geology.....	10[1]	Soph., jr., sr.	Chemistry
4w	Geology of Minnesota.....	5	Soph., jr., sr.	1-2
5f-6w	Economic Geology.....	6[1]	Jr., sr.	1-2
7f,s-8w,su	Laboratory Work.....	2[1]	Soph., jr., sr.	Supports 1-2
11f-12w	General Geology.....	8[1]	Soph., jr., sr.	None
21w-22s	Elements of Mineralogy.....	10[1]	Soph., jr., sr.	See statement
29f	General Physiography.....	5	Soph., jr., sr.	None
34w	Meteorology	3	Soph., jr., sr.	None
37s	Economic and Commercial Geography	3	All	None

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] Both quarters must be completed before credit will be given.

INTRODUCTORY COURSES

1f,s-2w,su. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours. EMMONS, TIEJE.

4w. GEOLOGY OF MINNESOTA. The physical geography and geologic history of Minnesota. The relations of industrial development to geological features. The principles of pre-Cambrian geology as exemplified in Minnesota. (Not offered in 1920-21.)

5f-6w. ECONOMIC GEOLOGY. The mineral resources of the United States. The origin, occurrence, distribution, and uses of the more important minerals and mineral fuels of economic value. Lectures, map work, conferences, and field excursions. SCHWARTZ.

[2] Absent on leave, 1920-21.

7f,s-8w,su. LABORATORY WORK. Open only to students taking Course 1-2. Supplements Course 1-2 with study of rocks and ores, topographic and geologic maps, and reference reading. JOHNSTON.

11f-12w. GENERAL GEOLOGY. A synoptical treatment of materials of the earth and of geologic processes. Physiographic, dynamic, structural, and historical geology. Lectures, laboratory work, field excursions, and conferences outside of class hours. TIEJE.

21w-22s. ELEMENTS OF MINERALOGY. Open to students taking chemistry. The crystal systems; morphological, physical, and chemical character of minerals; occurrence, genesis, and uses of minerals; classification and description of common minerals. Determinative work in laboratory blowpipe analysis, sight identification. GROUT.

29f. GENERAL PHYSIOGRAPHY. Principles of earth sculpture; physiographic changes in progress, and agencies causing them; hydrography and oceanography; planetary relations; climatology; field excursions. POSEY.

34w. METEOROLOGY. The properties and phenomena of the atmosphere, including composition, temperature, pressure, and circulation; the work of the weather bureau; the major climatic divisions of the earth and their climates. POSEY.

37s. ECONOMIC AND COMMERCIAL GEOGRAPHY. A study of the geographic factors influencing production and trade. Natural resources in their relation to commerce and industry and the major trade routes will be emphasized. POSEY.

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, JAMES DAVIES, ALFRED E. KOENIG, SAMUEL KROESCH, WALTER R. MYERS; Instructors LYNWOOD DOWNS, RICHARD JENTE.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,s	Beginning	5	All	None
2f,w	Beginning, Intermediate	5	All	1 or 1 yr. prep. Ger.
3f,s	Beginning, Advanced	5	All	2
10f,s	Rapid Reading	5	All	3
11w,s	Advanced Rapid Reading	5	All	10
12f,s	Narrative Prose	5	All	2 yrs. prep. Ger.
13f,w	Advanced Narrative Prose	5	All	12
28w-29s	Advanced Chemical German	6[1]	All	15
31f,w-32w,s	Medical German	6[1]	All	10 or 12 or 15
40w	Commercial German	5	All	10 or 13

[1] The full course must be completed before credit will be allowed.

No.	Title	Credits	Offered to	Prerequisite courses
50f-51w-52s	Composition	3[1]	Soph., jr., sr.[1]	11 or 13
53f-54w-55s	Conversation	3[1]	Soph., jr., sr.[1]	11 or 13
62f,s	German Comedies	3	Soph., jr., sr.[1]	11 or 13
63w	Modern Drama.....	3	Soph., jr., sr.[1]	11 or 13
64s	Classic Drama	3	Soph., jr., sr.	62 or 63

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

1f,s. BEGINNING. Pronunciation, conversation, grammar and composition; selected readings in easy prose and verse. ———

2f,w. BEGINNING, INTERMEDIATE. Continuation of Course 1. ———

3f,s. BEGINNING, ADVANCED. Selected texts from modern writers. ———

10f,s. RAPID READING. Modern narrative prose. KROESCH.

11w,s. ADVANCED RAPID READING. Continuation of Course 10. Selected dramas from the eighteenth and nineteenth centuries. KROESCH.

12f,s. NARRATIVE PROSE. Reading texts selected from modern prose writers. Grammar review and composition. ———

13f,w. ADVANCED NARRATIVE PROSE. Continuation of Course 13. ———

28w-29s. ADVANCED CHEMICAL GERMAN. Selections from more difficult works on chemistry. SCHLENKER, MYERS.

31f,w-32w,s. MEDICAL GERMAN. Readings from general works on physiology, anatomy, and bacteriology. BURKHARD.

40w. COMMERCIAL GERMAN. Vocabulary of commerce, business forms; reading of texts on economics.

50f-51w-52s. COMPOSITION. Aims to develop grammatical correctness. Translations from English selections. Essay writing on assigned subjects. DAVIES.

53f-54w-55s. CONVERSATION. Aims to develop ease and correctness of oral expression. Organized on the laboratory plan—one hour credit with two hours of recitation and one hour of outside reading. MYERS.

62f,s. GERMAN COMEDIES. Reading of the best comedies of the eighteenth and nineteenth centuries. DAVIES, MYERS.

63w. MODERN DRAMA. Plays of modern dramatists: Hauptmann, Sudermann, Fulda, and others. DAVIES, MYERS.

64s. CLASSIC DRAMA. Plays of Lessing, Goethe, and Schiller. DAVIES, MYERS.

HOME ECONOMICS

Professor MILDRED WEIGLEY; Instructor ALICE M. CHILD.

COURSE

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Course			
24s	Camp Cookery	3	All	None

For additional courses see the bulletin of the courses in home economics.

INTRODUCTORY COURSE

24s. CAMP COOKERY. This course is designed to give prospective foresters, engineers, and others a knowledge of the simpler cookery processes; and of such adaptations as are practicable in the several types of out-of-doors camps. (Given in alternate years. Not offered in 1920-21.) CHILD.

HORTICULTURE

Professor WILLIAM H. ALDERMAN; Associate Professor LEROY CADY.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
56w,s	Propagation and Nursery Practice	3	Soph., jr., sr.	90
71f	Landscape Gardening	3	All	None

For additional courses see the bulletin of the courses in agriculture.

INTRODUCTORY COURSES

56w,s. PROPAGATION AND NURSERY PRACTICE. Methods of propagating plants by seed, cuttings, layers, and grafting. Practical work in management of nursery stock, bulbs, and plants. Lectures, reference reading, and field trips. CADY.

71f. LANDSCAPE GARDENING. The practice and principles of landscape gardening as applied to the home and community. Lectures and field trips to parks and private grounds. CADY.

MILITARY SCIENCE AND TACTICS

Professor ALBERT G. GOODWYN, Captain, Infantry, U.S.A., Chairman; Assistant Professors BEN W. FIELD, Captain, Infantry, U.S.A.; LAURENCE T. WALKER, Captain, Coast Artillery Corps, U.S.A.; LEE R. WATROUS, JR., Captain, Coast Artillery Corps, U.S.A.; EDGAR B. MOOMAU, 1st Lieutenant, Infantry, U.S.A.; HARVEY G. THOMAS, 1st Lieutenant, U.S.A., Retired; Instructors JOEL R. BAKER, Master Signal Electrician, Signal Corps, U.S.A.; ALFRED BRANDT, Regimental Sergeant Major, Infantry, U.S.A.; HENRY W. BROWN, Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; KENNA B. CALDWELL, Sergeant, Coast Artillery Corps, Unassigned, U.S.A.;

AUBREY R. DUNKUM, 1st Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; WILLIAM FINKE, 1st Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; JOSEPH HAVLICEK, Regimental Commissary Sergeant, Infantry, U.S.A., Retired; WILLIAM L. HOGAN, 1st Sergeant, Coast Artillery Corps, Unassigned, U.S.A.; INGVALD M. JOHNSON, 1st Sergeant, Infantry, Unassigned, U.S.A.; JOSEPH LEES, 1st Sergeant, Infantry, U.S.A., Retired; JOHN MCWILLIAMS, 1st Sergeant, Infantry, U.S.A., Retired; WILLIAM G. PALMS, Sergeant, Infantry, Unassigned, U.S.A.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
1	First-Year Basic Course R.O.T.C.	None		None[1]
2a	Second-Year Basic Course R.O.T.C., Infantry	None		1
2b	Second-Year Basic Course R.O.T.C., Coast Artillery	None		1
2c	Second-Year Basic Course R.O.T.C., Signal Corps	None		1
3a	First-Year Advanced Course R.O.T.C., Infantry	[2]		2a
3b	First-Year Advanced Course R.O.T.C., Coast Artillery	[2]		2b
3c	First-Year Advanced Course R.O.T.C., Signal Corps	[2]		2c
4a	Second-Year Advanced Course R.O.T.C., Infantry	[2]		3a
4b	Second-Year Advanced Course R.O.T.C., Coast Artillery	[2]		3b
4c	Second-Year Advanced Course R.O.T.C., Signal Corps	[2]		3c

[1] Must be legally eligible for enrollment in Reserve Officers' Training Corps.
[2] Credit now under consideration by University authorities.

PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY A. ERIKSON, ANTHONY ZELENY; Professorial Lecturer LOUALLEN F. MILLER; Instructor JOSEPH VALASEK.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
21f,w,s,su	Elements of Mechanics	3	All	Trigonometry
22f,w,s,su	Elements of Mechanics Laboratory	1	All	21 or parallel
31f	Acoustics	3	All	None
41w	Heat	3	All	21
42w	Heat Laboratory	1	All	22, 41, or parallel
51f	Light	3	All	21
52f	Light Laboratory	1	All	22, 51, or parallel
61s	Magnetism and Electricity	3	All	21
62s	Magnetism and Electricity Laboratory	1	All	22, 61, or parallel

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSES

21f,w,s,su. ELEMENTS OF MECHANICS AND SOUND. Mechanics of solids, fluids, wave motion and sound. A study of the simpler fundamental principles. First part of a general Course 21, 41, 51, 61. Course 22 should be taken in conjunction with this course. ERIKSON.

22f,w,s,su. ELEMENTS OF MECHANICS LABORATORY. Measurements in the mechanics of solids, fluids, and wave motion; the laboratory part supplementing Course 21. ERIKSON.

31f. ACOUSTICS. A study of the fundamental principles of sound. A course designed primarily for the students in the Department of Music. Open also to other students. ERIKSON.

41w. HEAT. A study of the principles underlying heat phenomena. Course 42 should be taken in conjunction with this course. MILLER.

42w. HEAT LABORATORY. The laboratory part supplementing Course 41. MILLER.

51f. LIGHT. A study of the principles underlying light phenomena. Course 52 should be taken in conjunction with this course. VALASEK.

52f. LIGHT LABORATORY. The laboratory part supplementing Course 51. VALASEK.

61s. MAGNETISM AND ELECTRICITY. A study of the principles underlying magnetic and electric phenomena. Course 62 should be taken in conjunction with this course. ZELENY.

62s. ELECTRICAL LABORATORY. The laboratory part supplementing Course 61. ZELENY.

PHYSICAL EDUCATION

FOR MEN

Director LOUIS J. COOKE; Assistant Director WILLIAM K. FOSTER; Instructors EDWIN S. BROWN, PERCY C. GLIDDEN, D. C. MITCHELL, CARL B. ROEMER; Assistants FRANK GILMAN, HARRY GOLDIE.

General statement.—The purpose of the department is to provide all men of the University opportunity for exercise in order to maintain and build up their general health. It also provides special training for the correction of physical defects and functional derangements.

A physical examination is required of all new matriculants, and of all others using the department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate. Students taking the required work in physical education are examined also at the close of the year. A study of these records shows a marked improvement in the standard of health of the average student during the college course.

The gymnasium, swimming-pool, and baths are open to all students of the University, who are free to use the apparatus and to pursue a course in physical training under the supervision of the director and his assistants.

Those students, taking the required course in physical education, who can not swim, must make a reasonable effort, as determined by the department, to pass the swimming and life-saving requirements, and will be assigned special hours for instruction.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s	Personal Hygiene	1	Fr.	None
2f-3w[1]-4s	Gymnasium and Swimming.	None	Fr.	None
5f-6w-7s	Advanced Leaders.....	3[2]	Soph., jr., sr.	Instructor's permission
8f-9w-10s	Corrective Gymnastics.....	None	All	None
11w-12s[3]	Wrestling	None	All	Instructor's permission
13f-14w-15s[3]	Intermediate Swimming	None	All	Instructor's permission
16f-17w-18s[3]	Advanced Swimming.....	None	All	Instructor's permission
19w-20s[3]	Boxing	None	Fr.	None
21f-22w-23s[3]	Intramural Athletics	None	All	None

[1] Given at the University Farm.

[2] Full course must be completed before credit will be allowed.

[3] Students who meet all the requirements of Course 2 and show special ability may elect these courses instead of Course 2.

INTRODUCTORY COURSES

1f,w,s. PERSONAL HYGIENE. Two hours per week; first six weeks of fall quarter. Examination at close of course. Four hours per week collateral work with themes. COOKE, FOSTER, BROWN.

2f-3w-4s. GYMNASIUM AND SWIMMING. Two hours a week for the winter quarter. Required qualifications in swimming, life-saving, bar-vaulting, jumping, sprinting, running, and on heavy apparatus. FOSTER, GLIDDEN, MITCHELL, ROEMER.

5f-6w-7s. ADVANCED LEADERS. Three hours a week. FOSTER.

8f-9w-10s. CORRECTIVE GYMNASTICS. Three to six hours a week instead of regular gymnasium or military drill in case of physical disability. BROWN.

11w-12s. WRESTLING. Three times per week. Students admitted by special assignment.

13f-14w-15s. INTERMEDIATE SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. GLIDDEN.

16f-17w-18s. ADVANCED SWIMMING. Life-saving, efficiency swimming, and fancy diving. Instruction is given in rescuing and restoring the apparently drowned and other useful swimming accomplishments. GLIDDEN.

19w-20s. BOXING. By special arrangement a few students may be accomodated in this class which meets twice per week. GOLDIE.

21f-22w-23s. INTRAMURAL ATHLETICS. Competitive games in the various athletic leagues in football, basket-ball, hockey, track, and field events, baseball, tennis, swimming, handball, bowling, etc. FOSTER.

PLANT PATHOLOGY AND BOTANY

Professors EDWARD M. FREEMAN, ELVIN C. STAKMAN; Instructor GAIL F. PUTTICK.

General statement.—For opportunities to major in this division, see bulletin of courses in agriculture.

COURSE

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Course			
10s	Forest Pathology	5	Soph.	Bot. 10 cred.

For additional courses see the bulletin of the courses in agriculture.

INTRODUCTORY COURSE

10s. FOREST PATHOLOGY. Elementary study of plant diseases due to fungi, bacteria, and slime-molds; life histories and preventive methods. Lectures, laboratory, and reference. (Offered in alternate years. Offered in 1920-21.) STAKMAN, PUTTICK.

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Assistant Professor ALBERT J. LOBB.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f[1]	American Government	5	Soph., jr., sr.	None
7f,w	State and Local Government	5	Soph., jr., sr.	1
28s[1]	Business Law	5	Jr., sr.	10 cred. in pol. sci. or econ.
41s[1]	Rural Government	3	All	1

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] Given at the University Farm.

INTRODUCTORY COURSES

1f. AMERICAN GOVERNMENT. Organization and actual workings of the national government; nature and origin of the American governmental system.

7f,w. STATE AND LOCAL GOVERNMENT. Comparison of American state governments, especially Minnesota; relation of states to the United States and to local units of government; recent experiments such as initiative and referendum, the recall and primaries; social and economic legislation. LOBB.

28s. BUSINESS LAW. A course in business law (arranged for students in the College of Agriculture, Forestry, and Home Economics), including contracts, agency, mortgages, conveyances, and negotiable instruments. Not open to those who complete Course 26. LOBB.

41s. RURAL GOVERNMENT. The organization and functions of towns, school districts, villages, and counties; the assessment and taxation of property; road laws; and drainage. LOBB.

RHETORIC

Assistant Professors ROBERT C. LANSING, HARRY J. BURTIS; Instructors LIONEL CROCKER, RUTH MOHL.

General statement.—Rhetoric credits will not be granted officially until the close of the second quarter of the senior year.

Any instructor who finds that a student is deficient in English will submit the name of the student together with the evidence to the chairman of the Students' Work Committee. If the evidence warrants, the committee will send the student to the Section of Rhetoric for such additional work in English as is needed. This work the student must take, without credit, to validate his freshman and sophomore rhetoric credits.

Students whose work in the rhetoric courses shows at any time an inadequate knowledge of the conventions of English will be required to drop the course and enter a class in elementary rhetoric. These students will be required to complete 3 additional credit hours in rhetoric.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s	Rhetoric I	3	All	None
2f,w,s	Rhetoric II	3	All	1
3w,s	Rhetoric III	3	All	2
4f,w,s	Elementary Rhetoric	3	Fr.	None
11f,w,s	Argumentation	5	Soph., jr.	3
22f,w,s	Public Speaking	5	Soph., jr.	3
24f,w,s	Adv. Public Speaking	3	Soph., jr., sr.	22

INTRODUCTORY COURSES

1f,w,s. RHETORIC I. Note-taking, gathering and organizing material, oral and written exposition, paragraph structure, supplementary reading. LANSING, CROCKER, MOHL.

2f,w,s. RHETORIC II. Sentence structure, diction, exposition, supplementary reading. LANSING, CROCKER, MOHL.

3w,s. RHETORIC III. Description, narration, supplementary reading. LANSING, CROCKER, MOHL.

4f,w,s. ELEMENTARY RHETORIC. Elementary grammatical and rhetorical principles. MOHL.

11f,w,s. ARGUMENTATION. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating. BURTIS, LANSING, MOHL.

22f,w,s. PUBLIC SPEAKING. A practical course in fundamentals of speech-making. Rules of order and practice in conducting assemblies included. BURTIS.

24f,w,s. ADVANCED PUBLIC SPEAKING. A course in preparing and delivering occasional addresses and informal lectures. BURTIS.

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor EVERETT W. OLMSTED; Associate Professors RALPH E. HOUSE, RUTH S. PHELPS; Assistant Professors FRANCIS B. BARTON, JULES F. FRELIN, PEDRO HENRÍQUEZ UREÑA, EDWARD H. SIRICH; Professorial Lecturer ANTONIO HERAS; Instructors SOLOMON M. DELSON, CHARLES B. DRAKE, MARGUERITE GUINOTTE, SAMUEL VASCONCELOS, GUSTAVE VAN ROOSBROECK.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s-2w,s,f	Beginning French.....	10[1]	All	None
3f,w,s-4w,s,f	Intermediate French.....	10	All	1-2 or 2 yrs. H.S.
20f,s	Oral and Written French....	5	All	3-4 or 3 yrs. H.S.
21f-22w-23s	Survey of French Literature	9[1]	All	3-4 or 3 yrs. H.S.
50f-51w-52s	French Conversation.....	3[1]	Jr., sr.[2]	3-4 or 3 yrs. H.S.
53f-54w-55s	French Composition.....	3[1]	Jr., sr.[2]	3-4 or 3 yrs. H.S.
1f,w,s-2w,s,f	Beginning Spanish.....	10[1]	All	None
3f,w,s-4w,s,f	Intermediate Spanish	10	All	1-2 or 2 yrs. H.S.
20f,s	Oral and Written Spanish...	5	All	3-4 or 3 yrs. H.S.
65f-66w-67s	Survey of Spanish Literature	9[1]	Jr., sr.[2]	3-4 or 3 yrs. H.S.
50f-51w-52s	Spanish Conversation	3[1]	Jr., sr.[2]	3-4 or 3 yrs. H.S.
53f-54w-55s	Spanish Composition	3[1]	Jr., sr.[2]	3-4 or 3 yrs. H.S.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] The full course must be completed before credit will be allowed.

[2] Open without petition to sophomores who can satisfy the requirements.

INTRODUCTORY COURSES

1f,w,s-2w,s,f. BEGINNING FRENCH. Pronunciation, grammar, oral exercises, translation. FRELIN, DELSON, GUINOTTE.

3f,w,s-4w,s,f. INTERMEDIATE FRENCH. Review of grammar, connected prose composition, conversation, and reading of representative authors. FRELIN, GUINOTTE.

20f,s. ORAL AND WRITTEN FRENCH. Practical French conversation and composition. DRAKE.

21f-22w-23s. SURVEY OF FRENCH LITERATURE. This course will outline the history of French literature from 1600 to present day, and is prerequisite for the courses devoted to special periods. Representative texts will be read. PHELPS, SIRICH, VAN ROOSBROECK.

50f-51w-52s. FRENCH CONVERSATION. A small amount of outside preparation will be required. BARTON, FRELIN, GUINOTTE.

53f-54w-55s. FRENCH COMPOSITION. BARTON, FRELIN, GUINOTTE.

1f,w,s-2w,s,f. BEGINNING SPANISH. Pronunciation, grammar, oral exercises, and translation. OLMSTED, HENRÍQUEZ, DRAKE, VASCONCELOS.

3f,w,s-4w,s,f. INTERMEDIATE SPANISH. Review of grammar, conversation, connected prose composition, and reading of representative authors. HOUSE, VASCONCELOS.

20f,s. ORAL AND WRITTEN SPANISH. Practical Spanish conversation and composition. DRAKE.

65f-66w-67s. SURVEY OF SPANISH LITERATURE. An outline of the history of Spanish literature from 1500 to the present day, based upon texts and collateral reading. Prerequisite for courses devoted to special periods. HOUSE.

50f-51w-52s. SPANISH CONVERSATION. A small amount of outside preparation will be required. HERAS.

53f-54w-55s. SPANISH COMPOSITION. HERAS.

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The Bulletin *of the* University *of* Minnesota

The College of Agriculture, Forestry, and Home Economics

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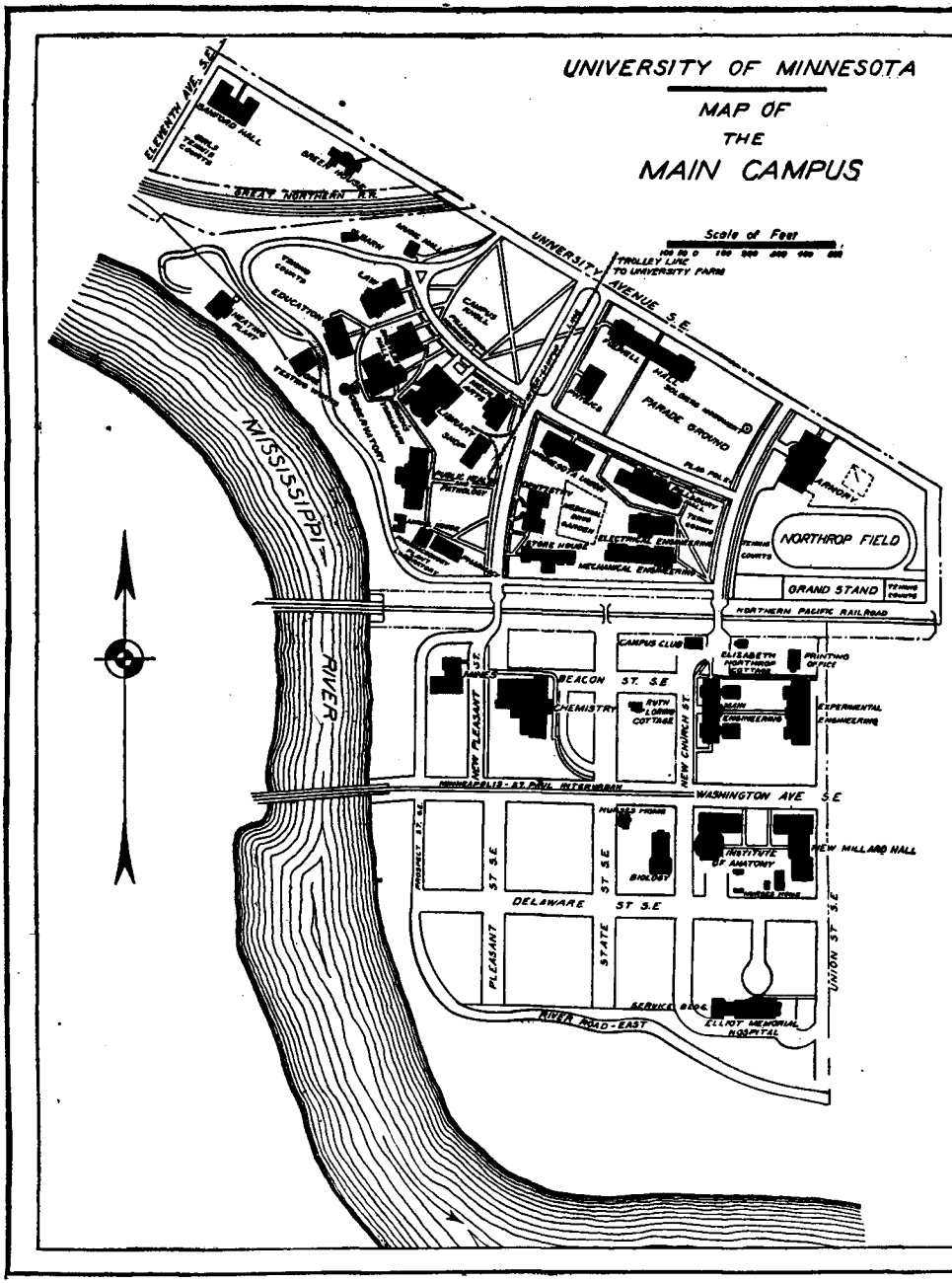
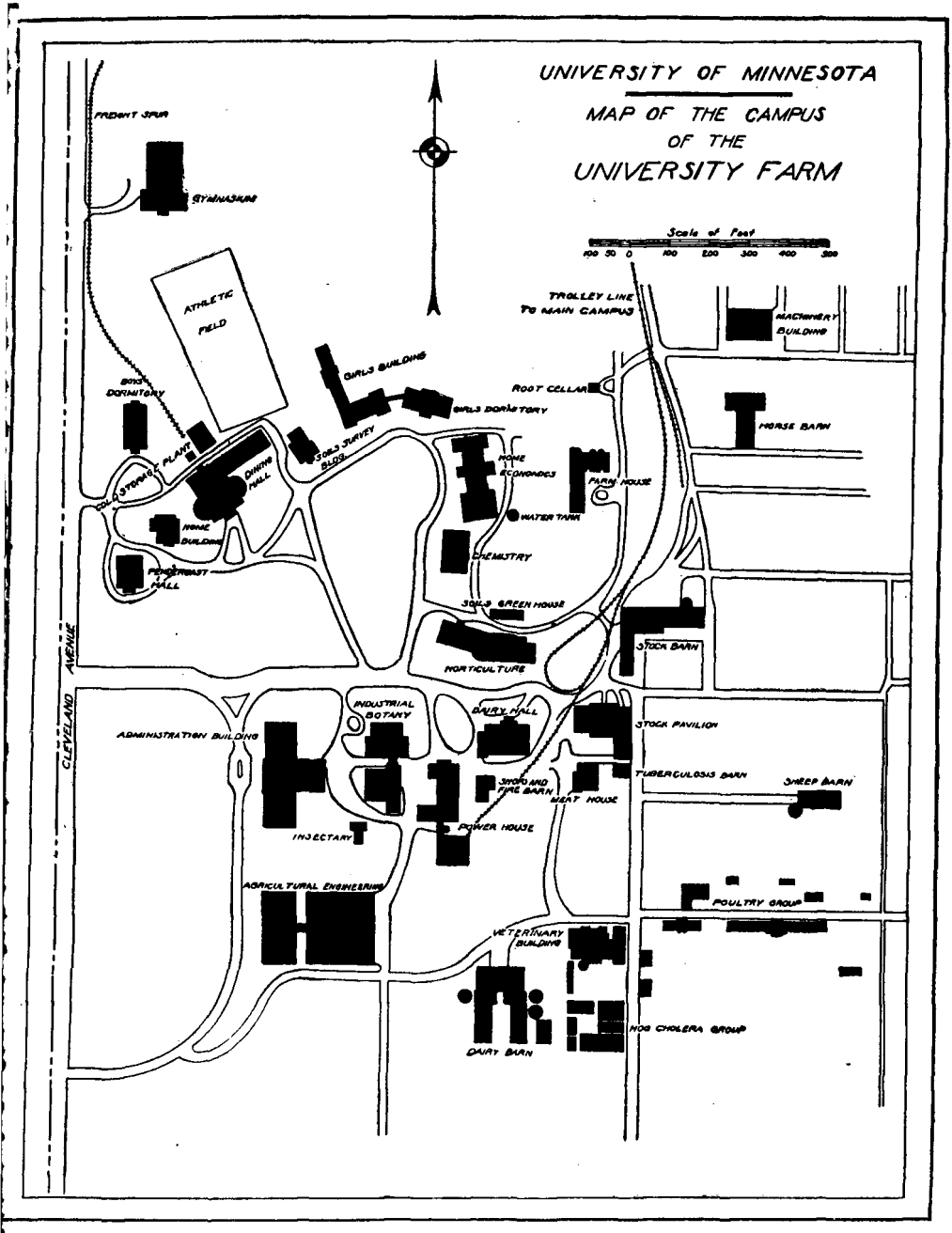


Area of Main Campus, 108.5 acres



Area of University Farm, 422.56 acres

1920

JULY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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1921

JANUARY

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FEBRUARY

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MARCH

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APRIL

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MAY

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JUNE

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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18	19	20	21	22	23	24
25	26	27	28	29	30	31
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CALENDAR

1920-1921

1920			
September	15	Wednesday	Registration closes except for new students
September	21-28	Week	Examinations for removal of winter and spring quarter conditions and entrance examinations
			Registration of new students. Payment of fees
September	29	Wednesday	Fall quarter begins, 8:15 a.m.
October	4	Monday	School of Agriculture, first term begins
October	15	Friday	Half holiday, annual freshman-sophomore contest
October	21	Thursday	Senate meeting, 4:30 p.m.
October	29	Friday	Last day for removal of spring quarter incompletes
November	2	Tuesday	Election Day; a holiday
November	15-27		Advanced Creamery Operators' Short Course
November / December	15 / 1		Advanced Cheese-Makers' Short Course
November	25	Thursday	Thanksgiving Day; a holiday
November / December	29 / 4	Week	Ice-Cream Makers' Short Course
December	6-11	Week	Milk Plant Operators' Short Course.
December	16	Thursday	Senate meeting, 4:30 p.m.
December	21	Tuesday	Last day for winter quarter registration except for new students
December	22	Wednesday	Fall quarter closes, 5:20 p.m.
			School of Agriculture, first term closes
			Christmas vacation begins, 5:20 p.m.
December / January	27 / 3	Week	Registration of new students. Payment of winter quarter fees
1921			
January	3-8	Week	Farmers' and Home-Makers' Week Short Course
January / February	3 / 12		Beginning Creamery Operators' Short Course
January	3-8		Threshermen's Short Course
January	3-8		Traction Engineering Short Course
January	4	Tuesday	Winter quarter begins, 8:15 a.m.
January	10	Monday	School of Agriculture, second term begins

February	1	Tuesday	Last day for removal of fall quarter incompletes
February	12	Saturday	Lincoln's Birthday; a holiday
February	17	Thursday	Senate meeting, 4:30 p.m.
February	22	Tuesday	Washington's Birthday; a holiday
March	16	Wednesday	Last day for spring quarter registration except for new students
March	24	Thursday	Winter quarter closes, 5:20 p.m. Spring vacation begins
March	24-29	Week	Registration of new students. Payment of spring quarter fees
March	30	Wednesday	Spring quarter begins, 8:15 a.m. School of Agriculture, second term closes
April	4-9		Boys' and Girls' Week Short Course
April	27	Wednesday	Last day for removal of winter quarter incompletes
May	19	Thursday	Senate meeting, 4:30 p.m.
May	30	Monday	Memorial Day; a holiday
June	12	Sunday	Baccalaureate service
June	14	Tuesday	Spring quarter closes
June	15	Wednesday	Forty-ninth annual commencement
June	17-18		Summer session registration. Payment of fees
June	20	Monday	Summer session begins
July	30	Saturday	Summer session closes

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[1] Resigned July 1, 1920.

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EDWARD H. SIRICH, Ph.D., Assistant Professor of Romance Languages
ELMER E. STOLL, Ph.D., Professor of English
FLETCHER H. SWIFT, Ph.D., Professor of Education
[1]ARTHUR J. TODD, Ph.D., Professor of Sociology
MARVIN J. VAN WAGENEN, Ph.D., Assistant Professor of Education
[1]HERBERT WOODROW, Ph.D., Associate Professor of Psychology
OTTO W. DAVIS, B.A., Lecturer in Sociology
ANTONIO HERAS, Bachiller, Licenciado en Derecho, Professorial Lecturer in Romance Languages
WILLIAM W. HODSON, B.A., LL.D., Lecturer in Sociology
ARTHUR H. TAYLOR, M.A., Lecturer in Sociology
EDWARD F. WAITE, LL.B., LL.M., Lecturer in Social and Civic Work
JEAN H. ALEXANDER, M.A., Instructor in Education
CAROLINE BEDFORD, B.A., Supervisor of Practice Field Work in Social and Civic Work
ANNE G. BENTON, B.A., Instructor in Bacteriology
LOUIS A. BOETTIGER, M.A., Instructor in Sociology
SOLOMON M. DELSON, Ph.B., Instructor in Romance Languages
LYNWOOD DOWNS, M.A., Instructor in German
CHARLES B. DRAKE, M.A., Instructor in Romance Languages
CHARLES C. GAULT, B.A., Instructor in Physiology
THADDEUS T. GIDDINGS, Instructor in Music
ESTHER GREISHEIMER, B.S., Ph.D., Instructor in Physiology
MARGUERITE GUINOTTE, Brevet Supérieur, Certificat d'Aptitude Pédagogique, Instructor in Romance Languages
RICHARD JENTE, Ph.D., Instructor in German
CHARLES E. LIVELY, M.A., Instructor in Sociology
FRANCES E. LOWELL, Ph.D., Instructor in Psychology
FRANCES M. MOREHOUSE, M.A., Instructor in Education
VICTOR H. PELZ, M.A., Instructor in Economics
GERTRUDE REEVES, Instructor in Pianoforte
ADOLPH RINGOEN, M.A., Instructor in Animal Biology
KARL SCHEURER, Instructor in Violin
HAZEL SMALL, Instructor in Art Education
CLARA F. SYKES, B.A., B.S., Instructor in Economics
MARION TEBBETTS, B.A., Supervisor of Practice Field Work in Social and Civic Work

[1] Absent on leave, 1920-21.

GUSTAVE VAN ROOSBROECK, M.A., Instructor in Romance Languages
SAMUEL VASCONCELOS, B.A., LL.B., Abogado, Instructor in Romance Languages
GUY H. WOOLLETT, Ph.D., Instructor in Chemistry
PAUL T. YOUNG, Ph.D., Instructor in Psychology
ALONZO S. GRACE, B.A., Assistant in Anthropology
ROBERT G. GREEN, B.A., Assistant in Bacteriology
ANDREW N. WRAY, Teaching Fellow in Sociology

GENERAL INFORMATION

ADMISSION

New students are admitted at the opening of any quarter.

All students entering for the first time must submit their credentials to the Enrollment Committee.

Admission is either by certificate or by examination. Candidates must have completed the equivalent of a four-year high-school course and must present:

1. Four units of English; or 3 units of English and 4 units of a foreign language; or 3 units of English and 2 units in each of two foreign languages.
2. One unit of elementary algebra and 1 unit of plane geometry.
3. Enough additional work to make in all 15 units, of which not more than 4 may be in subjects not listed in the admission groups in the general information bulletin.

Graduates of the School of Agriculture of the University of Minnesota who have completed the two summers of supervised work offered in the school course, one additional school year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

For details of admission requirements and definition of "unit," see the bulletin of general information.

Applicants for admission are urged to present physics (1 unit), and chemistry (1 unit), for entrance credits. If these subjects are not completed in the high school, they will have to be taken in the University, thus postponing some of the vocational courses.

FEES

Free tuition.—The state will pay the tuition of any student who served in the army, navy, or marine corps of the United States during any war in which the United States has been involved, including members of the national guard or who, upon the call of the president performed military service outside the borders of Minnesota in any trouble with Mexico and of any student who performed overseas service as a regularly enlisted full-time worker of the Red Cross, engaged in nursing the sick or assisting in the care of soldiers in any government hospital, field, or camp which service has been officially recognized by the national government. The amount of this free tuition is not to exceed $200 for any one person and the benefits of this act will not extend beyond July 1, 1924. The amount to be paid in any year will be limited by the legislative appropriation for that year. Application for this free tuition should be made to the secretary's office at the time of registration. This applies only to students, who at the time of enlistment were citizens and residents of the state of Minnesota. Any amount applied for in bonus under the state bonus law is deducted from the $200 available for tuition.

Tuition includes all of the regular quarter charges listed below except the deposit and penalty fees for change of registration, late registration, condition examinations, etc.

Tuition fee (per quarter)	
Residents of Minnesota	$20.00
Non-residents	30.00
Deposit (first quarter only)	5.00
Health fee (per quarter)	2.00
Shevlin Hall fee (per quarter)	.50
Post-office box (per quarter)	.20
Special fees:	
Examination for removal of conditions	1.00
Examinations for credit (after the first quarter in residence)	5.00
Special examinations	5.00
Change of registration	2.50

Late registration.—Old students must indicate their registration not later than two weeks before the day set for classes to begin. All students must complete their registration (including payment of fees) before the day set for classes to begin. Penalty for delay in either indicating or completing registration, five dollars. An additional one dollar is charged for each day of delay after the last day set for the completion of registration and a similar charge for each day of delay after the last day set for payment of fees.

Important.—The regulations require that no student be allowed to register after the quarter opens except by special committee action.

FACULTY REGULATIONS

Students are held responsible for compliance with all faculty regulations. These regulations are published in a booklet issued to students at the time of registration.

REQUIREMENTS FOR GRADUATION AND DEGREES

After the completion of one of the prescribed courses of study, including all of the required work and the requisite amount of elective work equivalent to a total of 189 credit hours (192 for those graduating in 1921), candidates will be recommended for graduation with the degree of Bachelor of Science.

CANDIDATES FOR THE TEACHER'S CERTIFICATE IN AGRICULTURE AND HOME ECONOMICS

Candidates for the teacher's certificate during the year 1920-21 will remain registered in the College of Agriculture, Forestry, and Home Economics.

The University desires, by encouraging the entrance of men and women into the profession of teaching, to emphasize the building up of a professional teaching spirit in its student body. Beginning with the year 1921-22 the University teacher's certificate will be granted only to graduates of the College of Education. Graduates of the College of Agriculture, Forestry, and Home Economics who have complied with the state requirements as to

educational subjects may apply to the State Department of Education for special certificates (or first-grade certificates if the candidate has had one year of successful teaching experience) in agriculture and home economics. This method of obtaining certificates will be available only as long as the State Department of Education feels that such certificates must be issued to meet the emergency in education and to comply with existing laws.

BOARD AND ROOM

Sanford Hall.—The one dormitory for university women, is located near the Minneapolis campus. It accommodates ninety women, about one half of whom may be freshmen. The charge for room and board is $300 for the university year. Applications should be sent to the director of Sanford Hall, University of Minnesota.

Home management houses.—Two residences for women, located near the University Farm campus, are maintained by the Division of Home Economics, furnishing accommodations for a small number of students. The charge is $90 each quarter, payable in advance. This covers the cost of living in the houses, with the exception of luncheon for the first five days of the week. Applications should be sent to the chief of the Division of Home Economics, University Farm, St. Paul. A deposit of $10 is required when a room is reserved.

Private houses.—After June 1 the registrar will supply a list of approved boarding and rooming places.

COURSES OF STUDY

The courses of study are designed (a) to prepare women for the responsibilities of citizenship and of home-making; (b) to prepare teachers for the extension of home economics education; (c) to prepare women for vocations which have as their foundation work of the home economics group.

A number of courses of study are outlined on the following pages. In addition, opportunity is offered through substitutions and selections of electives to prepare for other special fields of work. The outlined courses of study include:

1. General home economics as a type of general arts education for women
2. Foods and Nutrition
3. Textiles and Clothing
4. Students preparing for positions as dietitians
5. Students preparing for positions as institutional managers
6. Additional requirements for students preparing to teach in either the general field of home economics or the special fields of food and home management, textiles and clothing, and related art.

These teachers' courses, designed to prepare for the teaching of vocational courses in home economics, are arranged in accordance with the provisions of the Smith-Hughes Act.

The College of Agriculture, Forestry, and Home Economics, and the College of Education coöperate in the preparation of teachers of home economics as outlined in the Teachers' Course in Home Economics, Teachers' Course in Foods and Home Management, the Teachers' Course in Textiles and Clothing, and the Teachers' Course in Related Art.

The required work of the freshman and the sophomore years is the same in each course of study. Specialization is provided for in the junior and senior years.

HOME PRACTICE

Home practice in garment-making is required of students who have completed H.E. 11, as a prerequisite to H.E. 13. The character and amount of the home practice work will be arranged with a member of the section of Textiles and Clothing.

Home practice in foods and cookery is required of students who have completed H.E. 21 and 22, as a prerequisite to H.E. 35. The character and amount of the home practice work will be arranged with a member of the section of Foods and Cookery.

EXPLANATION OF COURSE NUMBERS

The quarters in which courses are offered are indicated by the letters f (fall), w (winter), s (spring), and su (summer) following the course number. For example: 5f,w,s indicates that Course 5 is given in the fall quarter and repeated in the winter quarter and again in the spring quarter; 5f-6w indicates a two-quarter course extending through the fall and winter

quarters and 5f,w-6w,s indicates that Course 5-6 is given in the fall and winter quarters and repeated through the winter and spring quarters.

All undergraduate courses are numbered from 1 to 100. All courses open to undergraduates and graduates are numbered from 101 to 200.

Numbers following the descriptive name of a course indicate the number of credit hours.

Course numbers in parentheses following the number of credit hours indicate prerequisite courses.

Descriptions of the courses listed in the following outline of the curricula, together with those of additional courses offered as electives, will be found on pages 25-60. The divisional statements are arranged alphabetically according to the names of the divisions.

One credit hour is equivalent to (1) one lecture or recitation period requiring two hours of preparation, (2) two periods of laboratory work requiring one hour of preparation, or (3) three periods of laboratory work with no preparation, each week for one quarter.

GROUP I. GENERAL REQUIREMENTS FOR ALL STUDENTS IN HOME ECONOMICS

FRESHMAN YEAR

All of the following work is required of every student except for the exemptions indicated. For some students this represents more than the regular amount of work of 15 credit hours per quarter. In such cases those subjects listed below which can not be taken in the freshman year must take precedence in the following year. Registration for from 14 to 16 credit hours of work each quarter will be allowed without special permission. Care should be taken in registration to give precedence to courses offered only one quarter.

1. *Non-credit courses* required for graduation in addition to the 189 credit hours.

Freshman lectures. A course of lectures, one hour per week, intended primarily to familiarize the new student with the college, college customs, and methods of procedure. Offered only in the fall quarter.

Phys. Educ. 1f-2w-3s, Elementary Physical Training. Three hours per week throughout the year.

2. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequences of continuation courses and the prerequisites must be observed.

An. Biol. 1f,w,s-2w,s,su, General Zoology, 10.

Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high-school chemistry may omit this course and register for Chem. 9-10. Those required to take this course because of inability to carry Chem. 9-10 successfully will be allowed not more than 10 credits.

Chem. 9f-10w, Advanced General Inorganic Chemistry, 10. Those required to take Chem. 1-2-3 are exempt.

Farm Eng. 30s, Household Physics, 5. Those presenting a year of high-school physics may omit this course and substitute 5 credits elective later in their course of study.

H. E. 3f,w,s, Textiles, 5

H. E. 11f,w,s, Garment-Making, 3

H. E. 51f,w,s, Drawing and Design, 3

Phys. Educ. 11f, Personal Hygiene, 1

Rhet. 1f,w,s, [1]Rhetoric I, 3
Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1.)
Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2.)
Rhet. 4f,w,s, Elementary Rhetoric, 3. Required only of those who are found to be unable to carry Rhet. 1

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 189 credit hours.

Phys. Educ. 43f,w,s, Elementary Swimming. Not required of those who can pass the swimming test in their freshman year.

2. *Freshman courses* which were not completed during the freshman year.
3. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed. From 15 to 17 credit hours should be selected each quarter.

Agr. Biochem. 3f,w,su, Types of Carbon Compounds, 6 (Chem. 10 cred.)
Bact. 1f,w,s,su, Elementary Bacteriology, 5 (Chem. 10 cred., Biol. 10 cred.)
H. E. 13f,w,s, Dressmaking, 5 (H. E. 3, 11, 51, Home Practice in Garment-Making.)
H. E. 21f,w,s, Foods and Cookery, 5 (Chem. 5 cred., Physiol. 3 or parallel.)
H. E. 22f,w,s, Food Economics, 5 (H. E. 21.)
Physiol. 4f,w,su, Human Physiology, 5 (Chem. 10 cred., Biol. 10 cred.)
Psychol. 1f-2w, General Psychology, 6.
Rhet. 11f,w,s, Argumentation, 5 (Rhet. 3)
Sociol. 1f,s, Introduction to Sociology, 3

4. *Electives.*—Enough elective credits should be selected to make, with the required work of the freshman and sophomore years a total of 93 credit hours. The number selected will vary from 1 to 11 credit hours depending upon the specific high-school preparation of each student. Those whose programs permit are advised to register for Rhet. 22, Public Speaking, 5, otherwise required in the junior year.

JUNIOR YEAR

1. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.

Econ. 7w,s, Principles of Economics, 5.
H. E. 37f,s,su, Home Care of the Sick, 3 (Chem. 5 cred., Bact. 1)
H. E. 40f, Child-Training, 3 (Psychol. 1-2)
H. E. 52f,w, Art History and Appreciation, 3 (H. E. 51)
H. E. 53f,w,s, Advanced Design, 4 (H. E. 51)
Rhet. 22f,w,s, Public Speaking, 5 (Rhet. 3)

2. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 21-23.
3. *Electives.* Enough electives should be selected to make, with those listed in 1 and 2 above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

SENIOR YEAR

1. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.

H. E. 34f,w,s,su, Home Management: Operation and Maintenance, Lectures, 3 (H. E. 22, Econ. 7 or parallel)
H. E. 35f,w,s,su, Home Management: Operation and Maintenance, Laboratory, 6 (H. E. 22, Home Practice in Foods and Cookery; must parallel H.E. 34)
H. E. 45w, Home Economics Survey, 2
H. E. 131f,w,s, Home Management: House-Planning and Equipment, 5 (52, 53)

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[1] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 53.

2. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 21-23.
3. *Electives.* Enough electives should be selected to make, with those listed in above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

GROUP II. SPECIAL REQUIREMENTS IN THE DIFFERENT LINES OF SPECIALIZATION (SUPPLEMENTARY TO GROUP I)

GENERAL COURSE IN HOME ECONOMICS

Junior year:
H. E. 23f,w, Nutrition I, 5 (H. E. 22, Bact. 1, Agr. Biochem. 3)
H. E. 108f,s,su, Nutrition II, 5 (H. E. 23)
Senior year:
H. E. 17f,w,s,su, Advanced Clothing Construction, 3 (H. E. 13, 52, 53)
H. E. 103f,w,s,su, Dietetics, 5 (H. E. 108)
H. E. 123f,w,s, Clothing Economics, 2 (H. E. 13, 52, 53, Econ. 7)

COURSE IN FOOD AND NUTRITION

Those students planning to specialize in Food and Nutrition should add the following courses to those listed in the General course.
Junior year:
Agr. Biochem. 2w, Quantitative Methods, 5 (Chem. 10 cred.)
Agr. Biochem. 108s,su, Chemistry of Wheat and Wheat Products, 3 (Agr. Biochem. 3)
H. E. 109s, Advanced Nutrition, 5 (H. E. 108, Agr. Biochem. 2)
Senior year:
H. E. 25w, Special Problems in Foods and Cookery, 3 (H. E. 22, 108)

COURSE IN TEXTILES AND CLOTHING

Those students planning to specialize in Textiles and Clothing should register for Advanced Clothing Construction and Clothing Economics in the junior year and add the following courses to those listed in the General course, omitting Nutrition I, Nutrition II, and Dietetics.
Junior year:
H. E. 55f,s, Decorative Needlework and Other Crafts, 3 (H. E. 3, 11, 51, 53, or parallel)
Senior year:
H. E. 18f,s, Commercial Clothing Manufacture, 4 (H. E. 17, or parallel)
H. E. 122f,w, Advanced Textiles, 3 (H. E. 3, 51. Quant. Chem. advised)

COURSE FOR DIETITIANS

Those students planning to become dietitians may omit the following courses from the General course in home economics:
Advanced Clothing Construction, Clothing Economics
They should add the following courses to those listed in the General course in home economics:
Junior year:
Agr. Biochem. 2w, Quantitative Methods, 5 (Chem. 10 cred.)
Educ. 55f,w,s, Elementary Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,s, Principles of Vocational Education, 3
H. E. 42w,s,su, Special Methods in Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2)
H. E. 109s, Advanced Nutrition, 5 (H. E. 108, Agr. Biochem. 2)

Senior year:
H. E. 25w, Special Problems in Foods and Cookery, 3 (H. E. 22, 108)
H. E. 61f,s, Large Quantity Cookery and Marketing, 4 (H. E. 22)
H. E. 63f,w, Institutional Experience, 3 (H. E. 22)
H. E. 67w, Institution Management, 4 (H. E. 61, 63)

COURSE IN INSTITUTION MANAGEMENT

Those students specializing in Institution Management may omit the following courses from the General course in home economics:
Advanced Clothing Construction, Clothing Economics

They should add the following courses to those listed in the General course in home economics:
Junior year:
H. E. 61f,w, Large Quantity Cookery and Marketing, 4 (H. E. 22)
H. E. 63f,w, Institutional Experience, 3 (H. E. 22)
Senior year:
H. E. 25w, Special Problems in Foods and Cookery, 3 (H. E. 22, 108)
Econ. 85f,86w, Marketing of Manufactured Products, 6 (Econ. 7)
Econ. 28s, Principles of Accounting, 5 (Econ. 7)
H. E. 67w, Institution Management, 4 (H. E. 61, 63)
H. E. 69s, Institution Management Practice, 3 (H. E. 67)

COURSES FOR TEACHERS

TEACHERS' COURSE IN HOME ECONOMICS

Students specializing in this course must complete the required work of the General course in home economics and in addition the following professional subjects:
Junior year:
Educ. 5s, The American School, 3 (Psychol. 1-2)
Educ. 55f,w,s, Elementary Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,s, Principles of Vocational Education, 3
H. E. 42w,s,su, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2)
Senior year:
H. E. 49f,w,s, Observation and Teaching 8 (42, Educ. 55 or Agr. Educ. 11, scholarship requirements, see page 39)

TEACHERS' COURSE IN FOODS AND HOME MANAGEMENT

Students specializing in this course must complete the required work of the course in Foods and Nutrition and in addition the following professional subjects:
Junior year:
Educ. 5s, The American School, 3 (Psychol. 1-2)
Educ. 55f,w,s, Elementary Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,s, Principles of Vocational Education, 3
H. E. 42w,s,su, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2)
Senior year:
H. E. 47f,w,s, Observation and Teaching, 8 (42, Educ. 55 or Agr. Educ. 11, scholarship requirement, see page 39)

TEACHERS' COURSE IN TEXTILES AND CLOTHING

Students specializing in this course must complete the required work of the course in Textiles and Clothing and in addition the following professional subjects:
Junior year:
Educ. 5s, The American School, 3 (Psychol. 1-2)
Educ. 55f,w,s, Elementary Educational Psychology, 3 (Psychol. 1-2) or Agr. Educ. 11f,s, Principles of Vocational Education, 3

H. E. 42w,s,su, Special Methods of Teaching Home Economics, 5 (H. E. 13, 22, Psychol. 1-2)

Senior year:

H. E. 48f,w,s, Observation and Teaching, 8 (42, Educ. 55 or Agr. Educ. 11, scholarship requirement, see page 39)

TEACHERS' COURSE IN RELATED ART

Students specializing in the teaching of related art may omit the following courses from the Textiles and Clothing course:

Commercial Clothing Manufacture, Advanced Textiles

They should add the following courses:

Junior year:

Art Educ. 32f-33w, Freehand Drawing and Composition, 6

H. E. 58, Costume Design, 3 (H. E. 11, 53)

Senior year:

Art Educ. 31, Fundamental Principles of Design, 3 (29-30 or H. E. 51, 53) or Art Educ. 40f, Principles of Harmony of Form and Color, 3 (29-30-31 or instructor's permission)

H. E. 57w, Weaving and Other Crafts, 3 (H. E. 3, 51, 53)

H. E. 54, Interior Design, 3 (H. E. 52, 53, 131)

In addition to the above they should add the following professional courses:

H. E. 46f,w,s, Observation and Teaching of Related Art, 8 (13, 52, 53, Educ. 55 or Agr. Educ. 11), 42, scholarship requirement, see page 39)

H. E. 43w, Organization and Methods for Related Art Teaching, 3 (H. E. 52, 53, 131)

COURSES OF STUDY FOR EXTENSION TEACHERS

Students desiring to prepare for extension teaching in home economics may pursue the Teachers' Course in Home Economics, or the Teachers' Course in Textiles and Clothing, and may substitute for Observation and Teaching, of the senior year, field work under the supervision of home economics extension specialists.

ELECTIVES

Students should consult with the faculty of the section in which they have chosen to major, with reference to the elective courses which must be chosen to make up the 189 credit hours required for graduation.

Only a limited number of elective courses are open to freshmen. First-year students, who for any reason are unable to follow the regular curriculum, are advised to fill their programs with a required course from the sophomore schedule, if possible, and postpone the choice of electives until the sophomore year. This plan will enable the student to obtain a better viewpoint from which to select electives and allow a wider range of subjects from which to choose.

In selecting electives, note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

FRESHMAN ELECTIVES

The following divisions and departments offer elective work to freshmen. For the descriptions of available courses see pages 25-60, and for departments marked S., L., and A., see the bulletin of the College of Science, Literature, and the Arts.

Botany (S., L., and A.)
Dairy Husbandry
German
History (S., L., and A.)
Horticulture
Mathematics (S., L., and A.)
Poultry Husbandry
Romance Languages

SOPHOMORE, JUNIOR, AND SENIOR ELECTIVES

Nearly all of the divisions offer elective work to sophomores, juniors, and seniors.

Elective courses in the College of Science, Literature, and the Arts, are separated into Junior College courses, open to freshmen and sophomores, and Senior College courses, open to juniors and seniors. In addition to satisfying other prerequisites an average grade of C must be maintained for the first two years in order to register for a Senior College elective.

DESCRIPTION OF COURSES

For explanation of course numbers and credits see page 19.

AGRICULTURAL BIOCHEMISTRY

Professors Ross Aiken Gortner, Clyde H. Bailey; Associate Professors R. Adams Dutcher; Assistant Professors George E. Holm, Clarence A. Morrow, John J. Willaman; Instructors Cornelia Kennedy, Paul F. Sharp.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
2w	Quantitative Methods	5	Jr., sr.	Chem. 10 cred.
3f,w,su	Types of Carbon Compounds.	6	Soph., jr., sr.	Chem. 10 cred.
	Advanced Courses			
101f,su-102w,su	Agricultural Quantitative Analysis	6	Jr., sr.	2, 3
108s,su[1]	Chemistry of Wheat and Wheat Products.....	3	Sr.	3
110s,su[1]	Flour Laboratory Methods...	5	Sr.	101-102, parallel 108
111f,su-112w,su	Phytochemistry	6	Sr.	Biol. 10 cred., org. chem.
113f,su-114w,su	Biochemical Laboratory Methods	4	Sr.	2, parallel 111-112
116f,w,s,su	Chemistry of "Vitamines" and Deficiency Diseases	3 or 5	Sr.	111-112, 113-114, or Physiol. 101-102, or H.E. 108
118f,w,s,su	Laboratory Problems in Biochemistry	3 or 5	Sr.	111-112, 113-114, or 108, 110 or 2, 3, and H.E. 108

For additional courses see the bulletin of the courses in agriculture.
[1] Offered in alternate summers, offered in 1921.

INTRODUCTORY COURSES

2w. Quantitative Methods. A brief course in the principles of quantitative analysis, including a study of stoichiometric problems, practice in the use of the balance and in typical gravimetric and volumetric manipulations. Willaman.

3f,w,su. Types of Carbon Compounds. An elementary study of the different groups of carbon compounds, with special reference to their relationships and their occurrence in plant and animal materials used as food. Morrow.

ADVANCED COURSES

101f,su-102w,su. Agricultural Quantitative Analysis. Estimation of inorganic and organic constituents of biological products, the proximate analysis of foods and feeding stuffs, the use of the polariscope, immer-

sion refractometer, colorimeter and nephelometer, viscosimeter, and other special apparatus. MORROW.

108s,su.[1] CHEMISTRY OF WHEAT AND WHEAT PRODUCTS. A lecture course, with collateral library reference work on the chemical technology of the production and milling of wheat and the conversion of its products into human food. BAILEY.

110s,su.[1] FLOUR LABORATORY METHODS. Laboratory course in methods of analysis of wheat and its products; milling tests of wheat; baking and special tests of flour. Designed to train students for research and control work in the cereal industry. BAILEY.

111f,su-112w,su. PHYTOCHEMISTRY. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes, and pigments, and their physico-chemical relations to the vital processes involved in growth and nutrition. MORROW.

113f,su-114w,su. BIOCHEMICAL LABORATORY METHODS. A laboratory course paralleling the lectures in 111-112, using recent methods for the investigation of biologically important compounds, with especial reference to the detection and estimation of such compounds in cells or tissues. MORROW, SHARP.

116f,w,s,su. CHEMISTRY OF "VITAMINES" AND DEFICIENCY DISEASES. Lectures, consultations, and library work on special nutritional problems, accompanied by chemical and biological studies of food materials from the standpoint of the "vitamine" content. DUTCHER, KENNEDY.

118f,w,s,su. LABORATORY PROBLEMS IN BIOCHEMISTRY. Special laboratory work in the preparation or isolation of pure compounds which occur in living cells, in the study of biochemical reactions, or in special methods of identification or determination of biochemical products. GORTNER, BAILEY, DUTCHER, MORROW, WILLAMAN.

AGRICULTURAL EDUCATION

Professors ASHLEY V. STORM, DEXTER D. MAYNE; Assistant Professor WILLIAM P. DYER.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
11f,s	Principles of Vocational Education..	3	Jr., sr.	None
21f,w	Vocational Education	3	Jr., sr.	None

For additional courses see the bulletin of the courses in agriculture.

INTRODUCTORY COURSES

11f,s. PRINCIPLES OF VOCATIONAL EDUCATION. A study of the fundamental principles upon which education is based. Throughout the course emphasis is placed on those phases which are most closely related to vocational education. DYER.

[1] Offered in alternate summers, offered in 1921.

21f,w. VOCATIONAL EDUCATION. A short history of vocational education; the present status in Europe and United States; manual training and home arts in an educational system; the place of agriculture in the public schools; trade and vocational schools. MAYNE.

AMERICANIZATION TRAINING AND ANTHROPOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor ALBERT E. JENKS; Assistant Professor OSCAR W. JUNEK; Assistant ALONZO S. GRACE.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s	Introduction to Anthropology	5	All	None
2f,w	General Anthropology.....	3	Soph., jr., sr.	1
5f,w,s	General Immigration.....	3	Soph., jr., sr.	1
12s	Ethnology	3	Soph., jr., sr.	1
60f	Slavic Culture	2	Jr., sr.	114
	Advanced Courses			
112s	The American Negro.....	3	Soph., jr., sr.	2 courses
113f	The American People, Older Immigrants	3	Soph., jr., sr.	3 courses
114w	The American People, Newer Immigrants	3	Jr., sr.	3 courses
115s	The American People, Americanisms and Assimilation..	3	Jr., sr.	3 courses

INTRODUCTORY COURSES

1f,w,s. INTRODUCTION TO ANTHROPOLOGY. Study of origin and development of human societies; various agencies which have determined type of social life; social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. JENKS, JUNEK, GRACE.

2f,w. GENERAL ANTHROPOLOGY. Theories, facts, and factors in the origin and distribution of human races. Early world migrations. Important anthropological problems. JENKS, GRACE.

5f,w,s. GENERAL IMMIGRATION. Facts of recent world migration. Chief causes of emigration from the old nests, and of immigration to the United States; federal and state problems of immigrant legislation, control, and distribution. JUNEK, GRACE.

12s. ETHNOLOGY. The different so-called races of men; their historical classifications; determinance of ethnic types; important ethnic problems. JENKS.

60f. SLAVIC CULTURE. The basic Slavic institutions. Characteristics of Slavic culture. JUNEK.

ADVANCED COURSES

112s. THE AMERICAN NEGRO. Development of the American Negro; his characteristics, conditions, and developing tendencies. Negro and immigrant adjustments. (Not offered in 1920-21.) JENKS.

113f. THE AMERICAN PEOPLE. OLDER IMMIGRANTS. Characteristics, contributions and distribution of the older immigrant peoples in America, their modification and importance to us. JENKS.

114w. THE AMERICAN PEOPLE. NEWER IMMIGRANTS. Characteristics, contributions and distribution of the newer immigrant peoples in America, their modification and importance to us. JENKS.

115s. THE AMERICAN PEOPLE. AMERICANISMS AND ASSIMILATION. Essential and unique historical americanisms, and their value and virility for the future in America. Conditions and facts of assimilation. JENKS.

ANIMAL BIOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professors HENRY F. NACHTRIEB, CHARLES P. SIGERFOOS; Assistant Professor ELMER J. LUND; Instructor ADOLPH RINGOEN.

COURSE

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Course			
1f,w,s-2w,s,su	General Zoology.....	10[1]	All	None

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] The full course must be completed before credit will be allowed.

INTRODUCTORY COURSE

1f,w,s-2w,s,su. GENERAL ZOOLOGY. A survey of the animal kingdom, emphasizing the principles of development and structure in relation to functions and habit, heredity and evolution, and the animals of economic importance. Lectures, quizzes, and laboratory. NACHTRIEB, SIGERFOOS, LUND, RINGOEN.

ART EDUCATION

COLLEGE OF EDUCATION

Assistant Professor RUTH RAYMOND; Instructor HAZEL SMALL.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
29f-30w-31s[1]	Fundamental Principles of Design	9	All	None[1]
32f-33w-34s	Freehand Drawing and Composition	9	All	None
	Still Life Composition and Sketch			
40f-41w-42s	Principles of Harmony in Form and Color.....	9	Soph., jr., sr.	29-30-31 or Instructors' permission

For additional courses see the bulletin of the College of Education.

[1] Home economics students who have completed H. E. 51 and 53 will be admitted to the last quarter's work.

INTRODUCTORY COURSES

29f-30w-31s. FUNDAMENTAL PRINCIPLES OF DESIGN. RAYMOND.

32f-33w-34s. FREEHAND DRAWING AND COMPOSITION. RAYMOND, SMALL.

40f-41w-42s. PRINCIPLES OF HARMONY IN FORM AND COLOR. RAYMOND.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

Professor WINFORD P. LARSON; Assistant Professor ARTHUR T. HENRICI; Instructor ANNE G. BENTON; Assistant ROBERT G. GREEN.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Course			
1f,w,s,su	General Bacteriology.....	5	Soph., jr., sr.	Chem. 10 cred., biol. 10 cred.
	Advanced Course			
105f	Household Bacteriology	3	Soph., jr., sr.	1

For additional courses see the bulletin of the Medical School.

INTRODUCTORY COURSE

1f,w,s,su. GENERAL BACTERIOLOGY. The preparation of culture media; the morphology of bacteria; methods of staining and identification; anaerobic bacteria; principles of sterilization and disinfection; examination of air, water, milk; relation of bacteriology to the industries. LARSON, HENRICI, BENTON, GREEN.

ADVANCED COURSE

105f. HOUSEHOLD BACTERIOLOGY. The decay, fermentation, and putrefaction of food-stuffs; molds; canning; bacterial food poisoning; bacteriology of the cleansing processes. BENTON.

BEE CULTURE

Professor FRANCIS JAGER; Assistant Professor GROVER C. MATTHEWS.

General statement.—Theoretical and practical instruction on bees, honey, and wax production. At least one year of botany should be completed before electing these courses. General zoology and economic entomology are also desirable. If not already completed they should be taken at same time as the courses in bee culture.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1s,su	Elements of Beekeeping I	3	Jr., sr.	None
2f,w	Elements of Beekeeping II ..	3	Jr., sr.	None
3w-4s	Advanced Beekeeping	6	Jr., sr.	1 or 2
5su	Queen-Raising	3	Jr., sr.	1 or 2

INTRODUCTORY COURSES

1s,su. ELEMENTS OF BEEKEEPING I. Fundamentals of bee behavior during the active season. Fundamentals of beekeeping practice during the active season. Modern equipment for beekeeping practice. Production of wax comb, and extracted honey. JAGER.

2f,w. ELEMENTS OF BEEKEEPING II. Fundamentals of bee behavior outside of the active season. Preparations for wintering. Indoor and outdoor wintering. JAGER.

3w-4s. ADVANCED BEEKEEPING. Anatomy, psychology, instinct, and reflex action, architecture and geometry of the honey comb, chemistry of pollen and honey. Pollenization and honey flora of the state. Bee diseases in their relation to honey production. JAGER.

5su. QUEEN-RAISING. Queen-judging, principles of reproduction, grafting, drone-raising, mating. Nuclei, mailing, introducing, requeening. In connection with University Farm queen bee raising station. JAGER, MATTHEWS.

CHEMISTRY

SCHOOL OF CHEMISTRY

Professors LAUDER W. JONES,[1] CHARLES F. SIDENER; Associate Professors WILLIAM H. HUNTER, FRANK H. MACDOUGALL; Assistant Professor ISAAC W. GEIGER; Instructor GUY H. WOOLLETT.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f-2w-3s	General Inorganic Chemistry...	12	All	None
9f-10w	Advanced General Inorganic Chemistry	10	All	H.S. chem.
11s	Qualitative Chemical Analysis.	4	Soph., jr., sr.	1-2-3
12s-13f	Qualitative Chemical Analysis.	10	Soph., jr., sr.	9-10
20w	Quantitative Analysis	5	Soph., jr., sr.	12-13
21s	Quantitative Analysis	5	Soph., jr., sr.	20
35f-36w	Organic Chemistry.....	10	Soph., jr., sr.	1-2-3 or 9-10
	Advanced Courses			
126s	Sanitary Water Analysis.....	1 or 2	Sr.	21
141f-142w-143s	Physical Chemistry	9, 12 or 15	Jr., sr.	Chem. 30 cred., phys. 15 cred.

For additional courses see the bulletin of the School of Chemistry.

INTRODUCTORY COURSES

1f-2w-3s. GENERAL INORGANIC CHEMISTRY. Designed for those who have had no high-school chemistry. 1-2—A study of the general laws of chemistry and of the non-metals and their compounds. 3—A study of the metals and their compounds. ———

9f-10w. ADVANCED GENERAL INORGANIC CHEMISTRY. Designed for those who have had one year of high-school chemistry. 9—General laws of chemistry; the non-metals and their compounds. 10—Metals and their compounds and ionic equilibrium, considered quantitatively. ———

11s. QUALITATIVE CHEMICAL ANALYSIS. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry. ———

[1] Resigned July 1, 1920.

12s-13f. QUALITATIVE CHEMICAL ANALYSIS. Laboratory work in systematic qualitative analysis with lectures on solution, ionization, chemical and physical equilibrium, oxidation and reduction, and other subjects pertinent to qualitative analysis. For students who satisfy the requirements of general chemistry.

20w. QUANTITATIVE ANALYSIS. An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. SIDENER, GEIGER, and Assistants.

21s. QUANTITATIVE ANALYSIS. Supplementary to 20. Further discussion of the principles and methods together with laboratory work on additional typical problems in gravimetric and volumetric analysis. SIDENER, GEIGER, and Assistants.

35f-36w. ORGANIC CHEMISTRY. An introduction to the chemistry of carbon compounds. The laboratory work will include the preparation of characteristic substances. HUNTER, WOOLLETT, and Assistants.

ADVANCED COURSES

126s. SANITARY WATER ANALYSIS. Lectures and laboratory practice in the chemical examination of potable waters. SIDENER, GEIGER.

141f-142w-143s. PHYSICAL CHEMISTRY. A general survey of the subject. Laboratory work three or six hours per week. Nine, 12, or 15 credits, depending on amount of laboratory work. MACDOUGALL.

DAIRY HUSBANDRY

ANIMAL HUSBANDRY GROUP

Professors CLARENCE H. ECKLES, JOSEPH R. KEITHLEY; Assistant Professor EDWIN O. HANSON; Assistant CHESTER DAHLE.

COURSE

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Course			
1f,w,s.	Elements of Dairying.....	5	All	None

For additional courses see the bulletin of the courses in agriculture.

INTRODUCTORY COURSE

1f,w,s. ELEMENTS OF DAIRYING. Composition of milk. Causes of variation in composition; milk constituents and their uses in dairy manufactures and as food; Babcock test; sanitary handling of milk and cream on the farm; cream-separating and farm butter-making. KEITHLEY, HANSON, DAHLE.

ECONOMICS

SCHOOL OF BUSINESS

Professors GEORGE W. DOWRIE, JOHN D. BLACK; Associate Professor BRUCE D. MUDGETT; Assistant Professor HOWARD S. NOBLE; Instructors CLYDE R. CHAMBERS, VICTOR H. PELZ, CLARA F. SYKES.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
7w,s[1]	Principles of Economics	5	Soph., jr., sr.	None
14s	Statistics	5	Soph., jr., sr.	3-4 or 5 and 6
23w	Principles of Organization and Management	5	Soph., jr., sr.	3-4 or 5 and 6
28s[1]	Principles of Accounting (Agricultural)	5	Soph., jr., sr.	3-4 or 5 and 6 or 7
85f-86w	Marketing of Manufactured Products	6	Jr., sr.	3-4 or 5 and 6 and 9 other credits in economics
94f	Office Management	3	Jr., sr.	3-4, 23, 25-26
	Advanced Course			
109w[1]	Economics of Consumption	3	Jr., sr.	3-4 or 5 and 6 or 7

[1] Given at University Farm.

INTRODUCTORY COURSES

7w,s. PRINCIPLES OF ECONOMICS. The principles of economics with more than the usual emphasis upon consumption. CHAMBERS.

14s. STATISTICS. Elementary principles of classification, analysis, and presentation of statistical materials, with primary emphasis on economic data. Lectures, readings, and laboratory work. MUDGETT.

23w. PRINCIPLES OF ORGANIZATION AND MANAGEMENT. Types of operating organization; specialization; coördination of men and departments; planning; delegation of authority; means of control; establishment and maintenance of standards for materials, operations, machinery; determination of business policies; personnel problems. PELZ.

28s. PRINCIPLES OF ACCOUNTING. (Agricultural.) Principles of general and cost accounting presented in somewhat abridged form. NOBLE.

85f-86w. MARKETING OF MANUFACTURED PRODUCTS. Organization of distributive channels; marketing of basic raw materials and manufactured products; relations, selling problems, and methods of manufacturers, wholesalers, retailers, and other factors in the distributive system; price policies; price maintenance. PELZ.

94f. OFFICE MANAGEMENT. Development of the office; organization; interrelation of departments; correlation by records; standardization of office practice. Study of actual office organizations with especial attention to factors which have influenced their development. Observation, reading, reports. SYKES.

ADVANCED COURSE

109w. ECONOMICS OF CONSUMPTION. Nature of human wants; standards of living; cost of living; income, administration of income; nature of demand; demand and price; relation of consumption to the population problem. BLACK.

EDUCATION

COLLEGE OF EDUCATION

Professors MELVIN E. HAGGERTY, FLETCHER H. SWIFT; Associate Professor WILFORD S. MILLER; Assistant Professors HERMIONE L. DEALEY, MARVIN J. VAN WAGENEN; Instructors JEAN H. ALEXANDER, FRANCES M. MOREHOUSE.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s	Brief Course in the Hist. of Educ.	5	Jr., sr.	Psychol. 9 cred. of which 6 may be in educ. psych.
3f,w,s	Social Aspects of Education	3	Jr., sr.	Psychol. 9 cred. of which 6 may be in educ. psych.
5s[1]	American School	3	Jr., sr.	Psychol. 6 cred.
11f,w,s	Technic of Teaching	3	Jr., sr.	Psychol. 9 cred. of which 6 may be in educ. psych.
55f,w,s	Elementary Educ. Psychology	3	Jr., sr.	Psychol. 6 cred.
	Advanced Courses			
101f-102w-103s	Historical Foundations of Modern Education	9	Jr., sr.	Phychol. 9 cred. of which 6 may be in educ. psych. hist. 10 cred.
106f-107w-108s	Advanced Educational Psychology	9	Sr.	Psychol. 9 cred. of which 6 may be in educ. psych.
111s	Educational Diagnosis	3	Sr.	1-2 or 101-102-103, 3
119f-120w	School Curricula	6	Sr.	1-2 or 101-102-103, 3

For additional courses see the bulletin of the College of Education.

[1] Given at University Farm.

INTRODUCTORY COURSES

1f,w,s. BRIEF COURSE IN THE HISTORY OF EDUCATION. Current school problems and educational theories in the light of their history. Emphasis upon secondary education and those aspects of education of most immediate concern to high-school teachers. Not open to those who have credit in Course 5. SWIFT, ALEXANDER.

3f,w,s. SOCIAL ASPECTS OF EDUCATION. The school as a community factor; the present peculiar relation of the school to social problems; the function of the school in these relations. ———

5s. AMERICAN SCHOOL. A brief survey of the factors determining the problem of public education in America, followed by a brief account of the development and organization of typical state school systems. Not open to those who have credit in Course 1. ALEXANDER.

11f,w,s. TECHNIC OF TEACHING. Types of classroom exercises; preparation of teaching plans; hygiene of instruction; classroom management; the professional ethics of teaching; observation of high-school work. MILLER, MOREHOUSE.

55f,w,s. ELEMENTARY EDUCATIONAL PSYCHOLOGY. A brief scientific study of individual behavior from the standpoint of the learning process. Special emphasis on economy of time and energy in learning, instinctive and emotional reactions, habit formation, methods of learning, fatigue. HAGGERTY, DEALEY.

ADVANCED COURSES

101f-102w-103s. FOUNDATIONS OF MODERN EDUCATION. Interpretative historical study of elements in modern education derived from Hebrews, Greeks, Romans, Middle Ages, etc. Emphasis on secondary and higher education and origin and results of monopoly of cultural conception of education and cultural studies. SWIFT.

106f-107w-108s. ADVANCED EDUCATIONAL PSYCHOLOGY. Psychology of learning. Methods of measuring rate of learning; study of typical learning experiments and examination of the conditions of the most economic learning, study of individual differences, and psychology of the school subjects. VAN WAGENEN.

111s. EDUCATIONAL DIAGNOSIS. A study of educational scales and standard tests for the measurement of efficiency in school subjects. The course will deal with the nature of tests, the methods of their use, and an analysis of results obtained. VAN WAGENEN.

119f-120w. SCHOOL CURRICULA. The curriculum as related to social, industrial, and economic conditions; a survey of the grammar grades and of the high-school. Consideration of the possibilities of developing a curriculum better adapted to the community needs. (Not offered in 1920-21.) ———

ENGLISH

Professors CARLETON BROWN, RICHARD BURTON, ELMER E. STOLL, FREDERICK KLAEBER; Associate Professors JOSEPH W. BEACH, CECIL A. MOORE.

General statement.—The following courses are recommended for election by the students of the College of Agriculture, Forestry, and Home Economics.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f-2w-3s	General Survey of English Literature	9	Soph., jr., sr.	Rhet. 1-2-3
4f,s	Old English	4	Jr., sr.	1-2-3 or parallel
6f,w	Chaucer	4	Jr., sr.	1-2-3 or parallel
8f,w	Shakespeare	4	Jr., sr.	1-2-3 or parallel
27w	History of the English Language	2	Jr., sr.	1-2-3, 4
40f	Bible as Literature	3	Soph., jr., sr.	1-2-3 or parallel
51w	Spenser	4	Jr., sr.	1-2-3
53s	Seventeenth-Century Lyrists	4	Jr., sr.	1-2-3
54s	American Literature	4	Jr., sr.	1-2-3
58w-59s	Nineteenth-Century Prose	6[1]	Jr., sr.	1-2-3
62w	Milton	4	Soph., jr., sr.	1-2-3
64s	Bacon	4	Jr., sr.	1-2-3
65s	Browning and Tennyson	4	Soph., jr., sr.	1-2-3
66f	English Novel	4	Jr., sr.	1-2-3

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

1f-2w-3s. General Survey of English Literature. Lectures, recitations, and assigned readings. Designed to prepare for more minute study of special periods. Stoll, Beach, Moore, Griffin.

4f,s. Old English. The language, with reading of representative selections of Old English prose and poetry. The relation to modern English is particularly emphasized. Klaeber.

6f,w. Chaucer. Reading of tales from the Canterbury collection, with introduction dealing with the grammar and literary forms of fourteenth-century English. Brown.

8f,w. Shakespeare. An introductory study of Shakespeare's development as a poet and dramatist up to *King Lear,* with reading of representative plays. Fall quarter, Stoll; winter quarter, ———

27w. History of the English Language. Outlines of the history of the language. Lectures and assigned readings. Klaeber.

40f. The Bible as Literature. A literary study of the Old Testament with special attention to forms and the critical study of selected readings. (Not offered in 1920-21.) Burton.

51w. Spenser. The forms and literary influences in the Elizabethan period illustrated in the poetry of Edmund Spenser, with brief readings from the minor poems and extended study of *The Faerie Queene.* (Not offered in 1920-21.) Stoll.

53s. SEVENTEENTH-CENTURY LYRISTS. The tradition of the Elizabethan lyric traced in the work of the metaphysical and cavalier school of poetry. (Not offered in 1920-21.)

54s. AMERICAN LITERATURE. Lectures on American literature, with extensive readings from the principal poets and prose writers of the United States. MOORE.

58w-59s. NINETEENTH-CENTURY PROSE. Studies in the more important prose writers of the nineteenth century, with reference to their styles, personalities, opinions, and relations to their period. Readings by students, and essays on approved topics. BEACH.

62w. MILTON. A special study of Milton, with some consideration of his contemporaries. STOLL.

64s. BACON. A study of Bacon as an essayist and as a promoter of learning. (Not offered in 1920-21.)

65s. BROWNING AND TENNYSON. A reading of the representative work of the two major poets of the Victorian era, in order to show their quality and contrasted power. BURTON.

66f. THE ENGLISH NOVEL. Principles and personalities in the evolution of the English novel. Written reports on selected novels. BURTON.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors WILLIAM A. RILEY, ARTHUR G. RUGGLES; Assistant Professor OSCAR W. OESTLUND.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,s,su	Introductory Entomology ...	5	Soph., jr., sr.	An. biol. 10 cred.
2w,su	Economic Entomology	5	Soph., jr., sr.	1

For additional courses see the bulletin of the courses in agriculture.

INTRODUCTORY COURSES

1f,s,su. INTRODUCTORY ENTOMOLOGY. Lectures and laboratory work on the characteristics and habits of insects. OESTLUND, RILEY.

2w,su. ECONOMIC ENTOMOLOGY. The life history, habits, and methods of control of the insect pests of orchard, field, and garden. Laboratory work in the determination of the more important forms. RUGGLES.

FARM ENGINEERING

AGRICULTURAL ENGINEERING GROUP

Professor WILLIAM BOSS; Assistant Professor ARTHUR G. TYLER; Instructor, MAURICE G. JACOBSON.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
3f,s	Mechanical Drawing	3	All	None
30s	Household Physics	5	All	None

For additional courses see the bulletin of the courses in agriculture.

INTRODUCTORY COURSES

3f,s. MECHANICAL DRAWING. Lectures on drawing, exercise in the use of drawing instruments, lettering, and water colors. The making of working drawings with their practical value. JACOBSON.

30s. HOUSEHOLD PHYSICS. Mechanics of solids and fluids; heat, light, sound, electricity, and magnetism. Application of physics to household problems. TYLER.

GERMAN

Professor CARL SCHLENKER; Assistant Professors OSCAR C. BURKHARD, JAMES DAVIES, ALFRED E. KOENIG, SAMUEL KROESCH, WALTER R. MYERS; Instructors LYNWOOD DOWNS, RICHARD JENTE.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,s	Beginning	5	All	None
2f,w	Beginning, Intermediate	5	All	1 or 1 yr. prep. German
3f,s	Beginning, Advanced	5	All	2
10f,s	Rapid Reading	5	All	3
11w,s	Advanced Rapid Reading	5	All	10
12f,s	Narrative Prose	5	All	2 yrs. prep. German
13f,w	Advanced Narrative Prose	5	All	12
28w-29s	Advanced Chemical German	6[1]	All	15
31f,w-32w,s	Medical German	6[1]	All	10 or 12 or 15
40w	Commercial German	5	All	10 or 13
50f-51w-52s	Composition	3[1]	Soph., jr., sr.	11 or 13
53f-54w-55s	Conversation	3[1]	Soph., jr., sr.	11 or 13
62f,s	German Comedies	3	Soph., jr., sr.	11 or 13
63w	Modern Drama	3	Soph., jr., sr.	11 or 13
64s	Classic Drama	3	Soph., jr., sr.	62 or 63

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] All quarters must be completed before credit is granted.

INTRODUCTORY COURSES

1f,s. BEGINNING. Pronunciation, conversation, grammar, and composition; selected readings in easy prose and verse. ———

2f,w. BEGINNING INTERMEDIATE. Continuation of 1. ———

3f,s. BEGINNING, ADVANCED. Selected texts from modern writers. ———

10f,s. RAPID READING. Modern narrative prose. KROESCH.

11w,s. ADVANCED RAPID READING. Continuation of 10. Selected dramas from the eighteenth and nineteenth centuries. KROESCH.

12f,s. NARRATIVE PROSE. Reading texts selected from modern prose writers. Grammar review and composition. ———

13f,w. ADVANCED NARRATIVE PROSE. Continuation of 13. ———

28w-29s. ADVANCED CHEMICAL GERMAN. Selections from more difficult works on chemistry. SCHLENKER, MYERS.

31f,w-32w,s. MEDICAL GERMAN. Readings from general works on physiology, anatomy, and bacteriology. BURKHARD.

40w. COMMERCIAL GERMAN. Vocabulary of commerce, business forms; reading of texts on economics.

50f-51w-52s. COMPOSITION. Aims to develop grammatical correctness. Translations from English selections. Essay writing on assigned subjects. DAVIES.

53f-54w-55s. CONVERSATION. Aims to develop ease and correctness of oral expression. Organized on the laboratory plan—one hour credit with two hours of recitation and one hour of outside reading. MYERS.

62f,s. GERMAN COMEDIES. Reading of the best comedies of the eighteenth and nineteenth centuries. DAVIES, MYERS.

63w. MODERN DRAMA. Plays of modern dramatists; Hauptmann, Sudermann, Fulda, and others. DAVIES, MYERS.

64s. CLASSIC DRAMA. Plays of Lessing, Goethe, and Schiller. DAVIES, MYERS.

HOME ECONOMICS

Professor MILDRED WEIGLEY; Associate Professors ALICE BIESTER, HARRIET GOLDSTEIN, MARION WELLER; Assistant Professors ALMA L. BINZEL, CLARA M. BROWN, MAUDE MILLER, AMY P. MORSE, E. MAUDE PATCHIN, NOLA TREAT; Lecturer MARTHA B. MOORHEAD; Instructors EDLA ANDERSON, ELIZABETH BACON, CARLOTTA BROWN, ALICE CHILD, JEAN M. DORSEY, HALLY J. FISHER, VETTA GOLDSTEIN, RUTH M. LINDQUIST, LOU LOMBARD, OLIVE B. MACCOMBER, MABEL C. MCDOWELL, MARGARET K. MUMFORD, ETHEL L. PHELPS, LENORE RICHARDS; Extension Specialists MARY L. BULL, LUCY CORDINER, ADELE KOCH, JULIA NEWTON, JUNIATA L. SHEPPARD.

General statement.—The following courses are planned primarily for students majoring in home economics, and are required in the courses of study in home economics, outlined on pages 21-23. They are open for election to students in other courses who offer the prerequisites as stated below.

Special attention is called to the prerequisites for Courses 46, 47, 48, and 49 required for the professional certificate. No student may register for these courses who has not attained an average grade of C in the first two years.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
3f,w,s	Textiles	5	All	None
4f,w,s	Textiles	3	All[2]	None
11f,w,s	Garment-Making	3	All	None
13f,w,s	Dressmaking	5	Soph., jr., sr.	3, 11, 51, Home Pract. in Garment-Making
17w,s,su	Advanced. Clothing Construction	3	Jr., sr.	13, 52, 53
18w,s	Commercial Clothing Manufacture	4	Sr.	17 or parallel
21f,w,s	Foods and Cookery	5	Soph., jr., sr.	Chem. 5 cred. Physiol. 3 parallel
22f,w,s	Food Economics	5	Soph., jr., sr.	21
23f,w	Nutrition I	5	Jr., sr.	22, Agr. Biochem. 3 Bact. 1
24s	Camp Cookery	3	All[2]	None
25w	Special Problems in Foods and Cookery	3	Sr.	22, 108
34f,w,s,su	Home Management: Operation and Maintenance, Lectures	3	Jr.,[1]sr.	22, 35, parallel, Econ. 7 or parallel
35f,w,s,su	Home Management: Operation and Maintenance, Laboratory	6	Jr.,[1]sr.	22, Home Pract. in Foods and Cookery, 34 parallel
37f,s,su	Home Care of the Sick	3	Jr., sr.	Chem. 5 cred., Bact. 1
40f	Child-Training	3	Jr., sr.	37, Psychol. 1-2
42f,w,s,su	Special Methods of Teaching Home Economics	5	Jr., sr.	13, 22, Psychol. 1-2
43w[1]	Organization and Methods for Related Art Teaching	3	Sr.	52, 53, 131
44s	Methods in Home Economics Extension Work	3	Sr.	42
45w	Home Economics Survey	2	Sr.	None
46f,w,s	Observation and Teaching: Related Art	8	Sr.	13, 42, 52, 53, Educ. 55 or Agri. Educ. 11, see general statement above

[1] Open to juniors only in their third quarter.
[2] Not open to students in home economics.

No.	Title	Credits	Offered to	Prerequisite courses
47f,w,s	Observation and Teaching: Foods and Home Management	8	Sr.	42, Educ. 55 or Agric. Educ. 11, see general statement above
48f,w,s[1]	Observation and Teaching: Textiles and Clothing	8	Sr.	42, Educ. 55 or Agric. Educ. 11, see general statement above
49f,w,s[1]	Observation and Teaching: General Home Economics	8	Sr.	42, Educ. 55 or Agric. Educ. 11, see general statement above
51f,w,s	Drawing and Design	3	All	None
52f,w,s	Art History and Appreciation	3	Jr., sr.	51
53f,w,s	Advanced Design	4	Jr., sr.	51
54	Interior Design	3	Sr.	52, 53, 131
55f,s	Decorative Needlework and Other Crafts	3	Jr., sr.	3, 11, 51, 53 or parallel
57w	Weaving and Other Crafts	3	Jr., sr.	3, 51, 53
58	Costume Design	3	Jr., sr.	11, 53
61f,s	Large Quantity Cookery and Marketing	4	Jr., sr.	22
63f,w	Institutional Experience	3	Jr., sr.	22
67w	Institution Management	4	Sr.	61, 63
69s	Institution Management Practice	3	Sr.	67
70w	Food Preparation in Relation to Social Work	3	Soph.,[2]jr., sr.	An. Biol. 1-2, chem. 10 cred. advised
71s	Elementary Dietetics for the Social Workers	3	Soph.,[2]jr., sr.	70, Physiol. 3 or parallel
72f	Home Management Problems	3	Soph.,[2]jr., sr.	71, Econ. 7 or parallel
	Advanced Courses			
103f,w,s	Dietetics	5	Sr.	108
108f,w,s,su	Nutrition II	5	Jr., sr.	23
109s	Advanced Nutrition	5	Jr., sr.	108, Agr. Biochem. 2
122f,w	Advanced Textiles	3	Jr., sr.	3, 51, quant. chem. a desired prereq.
123f,w,s	Clothing Economics	2	Jr., sr.	13, 52, 53, Econ. 7
131f,w,s	Home Management: House-Planning and Equipment	5	Sr.	52, 53

[1] College of Education.

[2] Open to sophomores only in their third quarter. Not open to students in home economics except by special permission of the head of the division.

INTRODUCTORY COURSES

3f,w,s. TEXTILES. A study of textile fibers, their structure, properties, and chemical reactions; of fabrics, their structure and processes of manufacture; of art and economic consideration in selection and purchase of materials for clothing and household-furnishing. WELLER, PHELPS.

11f,w,s. GARMENT-MAKING. Instruction and laboratory practice in hand sewing; in the reading and adaptation of commercial patterns; in the construction and use of the sewing machine; in designing, cutting, and making simple outer garments from washable materials. MCDOWELL.

13f,w,s. DRESSMAKING. Consideration of quality, suitability, and cost of materials adapted to technic involved in construction of simple wool and silk dresses; adaptation of art principles in selection of designs; instruction and practice in methods of construction. PATCHIN, MCDOWELL.

17f,w,s,su. ADVANCED CLOTHING CONSTRUCTION. Laboratory course involving the applicaton of principles of costume-modeling in the construction of one high-grade garment, suit, coat, or dress. One day a week will be given to a millinery problem. WELLER, PATCHIN, CARLOTTA BROWN.

18w,s. COMMERCIAL CLOTHING MANUFACTURE. A study of the organization of the clothing trades and industries; of wages and standards of efficiency in workmanship. Laboratory practice upon a commercial basis, measured by trade standards. PATCHIN.

21f,w,s. FOODS AND COOKERY. (a) Production, manufacture, chemical composition of typical foods; their classification into food principles; changes in digestion; function in nutrition. (b) Fundamental science principles from chemistry, physics, biology, bacteriology, and their application in typical cookery processes. CHILD.

22f,w,s. FOOD ECONOMICS. Cost and nutritive value of typical foods; the study of dietaries; preparation and serving of meals, the cost bearing a definite relation to the family budget. CHILD.

23f,w. NUTRITION I. A study of the chemistry and physiology of metabolism, involving a qualitative examination of the food principles; of the body tissues; of salivary, gastric, and pancreatic digestion. BIESTER, MUMFORD, ANDERSON.

24s. CAMP COOKERY. This course is designed to give prospective foresters, engineers, and others a knowledge of the simpler cookery processes; and of such adaptations as are practicable in the several types of out-of-doors camps. Not open to home economics students. (Given in alternate years. Not offered in 1920-21.)

25w. SPECIAL PROBLEMS IN FOODS AND COOKERY. An intensive study of problems in foods and food preparation with individual laboratory problems. WEIGLEY, CHILD.

34f,w,s,su. HOME MANAGEMENT: OPERATION AND MAINTENANCE, LECTURES. Discussion of management responsibilities of home-maker with special emphasis on budgets and household accounts. LINDQUIST.

35f,w,s,su. HOME MANAGEMENT: OPERATION AND MAINTENANCE, LABORATORY PRACTICE. (a) Twelve weeks' experience as manager and helper in a household of twenty members. (b) Experience in care and training of eighteen-months-old child. LINDQUIST.

37f,s,su. HOME CARE OF THE SICK. (a) First aid; communicable diseases; their transmission and prevention; hygiene of infancy, maidenhood, maturity. (b) The care of the sickroom; observation and care of the patient; elementary symptomatology. MOORHEAD, FISHER.

40f. CHILD-TRAINING. Application of modern science in rearing, training, and educating children. Emphasis placed on the physical care of the baby; infant-feeding; infant diseases; early training; the obligation of the home; the obligation of the nation. BINZEL.

42f,w,s,su. SPECIAL METHODS OF TEACHING HOME ECONOMICS. Curricula, equipment, methods of teaching for home economics. Required of all students preparing to teach. WELLER, CLARA BROWN, MILLER.

43w. ORGANIZATION AND METHODS FOR RELATED ART TEACHING. Organization of a related art course and methods of teaching art principles as applied to familiar objects and processes. H. GOLDSTEIN.

44s. METHODS IN HOME ECONOMICS EXTENSION WORK. Study of state and national plans for home economics extension work; methods of organization and practical presentation of subject-matter; preparation of illustrative material; field work. LOMBARD, NEWTON.

45w. HOME ECONOMICS SURVEY. A discussion of the historical development of home economics with special emphasis upon current problems. WEIGLEY.

46f,w,s. OBSERVATION AND TEACHING: RELATED ART. A course similar to 47, but dealing with the teaching of related art. GOLDSTEIN, BACON.

47f,w,s. OBSERVATION AND TEACHING: FOODS AND HOME MANAGEMENT. Observation of teaching in regular classes; criticism and discussion of class practice, lesson plans, methods, results, and examinations; preparation of lesson plans, and directed teaching of foods and cookery, and home management. MILLER, DORSEY, LOMBARD.

48f,w,s. OBSERVATION AND TEACHING: TEXTILES AND CLOTHING. A course similar to 47, but dealing with the teaching of textiles and clothing. CLARA BROWN, BACON, MACCOMBER.

49f,w,s. OBSERVATION AND TEACHING: GENERAL HOME ECONOMICS. A combination of 47 and 48 giving the student experience in teaching both fields of work. Required of students in the general teaching course. Those who have completed 46, 48 or 49 may register and receive 2 credits. CLARA BROWN, MILLER.

51f,w,s. DRAWING AND DESIGN. Composition, perspective, color theory, and color harmonies applied to costume design and interiors; harmony, balance, rhythm, in line and area design. V. GOLDSTEIN.

52f,w,s. ART HISTORY AND APPRECIATION. The historical development of art, architecture, decoration, furniture, and costume, studied with special emphasis on design and influence upon modern styles. H. GOLDSTEIN, V. GOLDSTEIN.

53f,w,s. ADVANCED DESIGN. Problems in design for house furnishings and for costume, including dress-modeling. H. GOLDSTEIN, V. GOLDSTEIN.

54. INTERIOR DESIGN. Form color and texture as applied to the average home. Wood finishes, backgrounds, floor coverings, hangings, furniture, decorative objects, etc. Problems worked out with actual materials as well as in water-color drawings. (Not offered in 1920-21.)

55f,s. DECORATIVE NEEDLEWORK AND OTHER CRAFTS. Applied design in needlework, lace, and appliqué, in problems relating to dress and house furnishings. MORSE.

57w. WEAVING AND OTHER CRAFTS. Applied design in two and four harness hand-loom weaving, batik and block printing in problems relating to dress and house-furnishing. MORSE.

58. COSTUME DESIGN. Study of the proportions of the human figure; lines and colors for different types of individuals; designs rendered in fabrics, pencil technic and water color. (Not offered in 1920-21.)

61f,s. LARGE QUANTITY COOKERY AND MARKETING. Application of principles of cookery to large quantity preparation; planning of meals for dining-hall and cafeteria; calculation of cost and calories in standard servings; study of problems involved in purchase of institution supplies. RICHARDS.

63f,w. INSTITUTIONAL EXPERIENCE. Experience in the minor problems of administration. TREAT, RICHARDS.

67w. INSTITUTION MANAGEMENT. Lectures and discussions of the problems involved in institution management; organization; service; institution-planning, decoration, and equipment; budgets, and the study of different types of institutions. TREAT.

69s. INSTITUTION MANAGEMENT PRACTICE. A continuation of 63 with responsibility for management; field work in different types of institutions. TREAT, RICHARDS.

70w. FOOD PREPARATION IN RELATION TO SOCIAL WORK. A study of the principles underlying cookery with special emphasis on the preparation of foods to be used in homes with limited incomes. LINDQUIST.

71s. ELEMENTARY DIETETICS FOR THE SOCIAL WORKER. Involves principles underlying adequate feeding. Food habits of different economic and racial groups forming the basis for actual planning and preparation of meals. MUMFORD.

72f. HOME-MANAGEMENT PROBLEMS. Involves the making of sound budgets. Studies are based upon racial groups and the size of the family together with the income. LINDQUIST.

ADVANCED COURSES

103f,w,s. DIETETICS. The fundamental principles of human nutrition as applied to the feeding of individuals and groups under conditions of health, and under such pathological conditions as are chiefly dependent upon dietetic treatment. BIESTER.

108f,s,su. NUTRITION II. A continuation of 23, including the qualitative examination of blood, bile, milk; urine analysis; metabolism experiments. MUMFORD.

109s. ADVANCED NUTRITION. Quantitative methods are applied in studying human metabolism. Opportunity is offered for the individual investigation of selected problems pertaining to metabolism. BIESTER.

122f,w. ADVANCED TEXTILES. An experimental study of special problems in textiles with a consideration of means for obtaining standardization. Quantitative chemistry a desired prerequisite. WELLER.

123f,w,s. CLOTHING ECONOMICS. General consideration of the economic problems in clothing production; women's responsibility for conditions in textiles and clothing industries; study of the budget for clothing and household textiles; hygiene and standardization of dress. WELLER.

131f,w,s. HOME MANAGEMENT: HOUSE-PLANNING AND EQUIPMENT. House-planning, house-furnishing and equipment, and construction and furnishing budgets. Types of domestic architecture; site; floor-plans; building materials; details of construction; heating; ventilating; lighting; plumbing; walls; rugs; furniture; color; hangings; pictures; gardens. MORSE.

HORTICULTURE

Professor WILLIAM H. ALDERMAN; Associate Professors WILFRED G. BRIERLEY, LEROY CADY; Assistant WILLIAM T. TAPLEY.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
50s	Floriculture	3	All	None
56w,s	Propagation and Nursery Practice	3	Soph., jr., sr.	90
71f	Landscape-Gardening	3	All	None
90f,s	General Horticulture	3	All	None

For additional courses see the bulletin of the courses in agriculture.

INTRODUCTORY COURSES

50s. FLORICULTURE. Designed to give the student a working knowledge of the culture and uses of common house plants, annuals, perennials, and greenhouse plants. Lectures, reference-reading, and laboratory. CADY.

56w,s. PROPAGATION AND NURSERY PRACTICE. Methods of propagating plants by seed, cuttings, layers, and grafting. Practical work in management of nursery stock, bulbs, and plants. Lectures, reference-reading, and field trips. CADY.

71f. LANDSCAPE-GARDENING. The practice and principles of landscape-gardening as applied to the home and community. Lectures and field trips to parks and private grounds. CADY.

90f,s. GENERAL HORTICULTURE. A study of the horticultural industry, including the elements of fruit-growing, vegetable-growing, plant propagation, and landscape-gardening. ALDERMAN, BRIERLEY, CADY, TAPLEY.

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor CARLYLE SCOTT; Assistant Professor DONALD FERGUSON; Instructors THADDEUS P. GIDDINGS, ABE PEPINSKY, GERTRUDE REEVES, KARL SCHEURER.

General statement.—Credit is offered to students in the College of Agriculture, Forestry, and Home Economics who may wish to elect work in the Department of Music. Nine credits may be obtained. The following courses are recommended:

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f-2w-3s	Harmony	9[2]	Jr., sr.	None
14f-15w-16s	History of Music	9[2]	Soph., jr., sr.	None
17f-18w-19s	Appreciation of Music	3[2]	Jr., sr.	None
39f-40w-41s	Pianoforte	6-12	Jr., sr.	See statement
51f-52w-53s[1]	Violin	6-12	Jr., sr.	See statement
75f-76w-77s[1]	Public-School Music	9[2]	Jr., sr.	None
91f-92w-93s[1]	Orchestra	3[2]	Jr., sr.	None
97f-98w-99s	Choir	3	Jr., sr.	None

For additional courses see the bulletin of the College of Science, Literature and the Arts.

[1] Given at University Farm.

[2] The full course must be completed before credit will be allowed.

INTRODUCTORY COURSES

1f-2w-3s. HARMONY. The study of chords, their construction, relations, and progressions. Written exercises on basses, the harmonization of given melodies. SCOTT.

14f-15w-16s. HISTORY OF MUSIC. Some account of primitive systems and of the early Christian modal and harmonic developments, leading to a general survey of musical literature from Bach to the present time. FERGUSON.

17f-18w-19s. APPRECIATION OF MUSIC. A non-technical course. REEVES.

39f-40w-41s. PIANOFORTE. Open to juniors who have mastered technical difficulties of the degree of Czerny's *School of Velocity* and the easier Haydn and Mozart sonatas. The fee is $32 or $64 a semester. SCOTT, FERGUSON, REEVES.

51f-52w-53s. VIOLIN. Candidate must be able to play the first ten of Kreutzer's forty études, and the easier Handel and Mozart sonatas. PEPINSKY, SCHEURER.

75f-76w-77s. PUBLIC-SCHOOL MUSIC. Preparation for teachers and supervisors of music in public, high, and normal schools. Piano-playing, singing, and ready reading prerequisite. Four hours in class and one half-day weekly in public-school visiting. Practice teaching demanded. GIDDINGS.

91f-92w-93s. ORCHESTRA. PEPINSKY.

97f-98w-99s. CHOIR.

PHYSICAL EDUCATION FOR WOMEN

Professor J. ANNA NORRIS; Assistant Professor MAY S. KISSOCK;[1] Instructors GERTRUDE M. BAKER,[1] VALERIA G. LADD, GERTRUDE B. SCHILL, ALICE H. TOLG.

General statement.—This department aims primarily to promote the health of the women students. It gives physical examination and advice to all on entrance; plans systematically to keep in close touch with them during their first year in college; conducts yearly consultations with, and examines when necessary, all upper-class students; gives courses in hygiene; organizes physical work to meet the varying needs and physical tastes of students; coöperates closely with the Woman's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this department is required of all newly entering students (see Courses 1-2-3 and 11), of all sophomores who can not pass the swimming examination (see Course 43), and of all students permitted, for

[1] Absent on leave, 1920-21.

reasons connected with their physical condition, to carry less than the minimum number of credit hours. Physical examinations or consultations required annually of all students.

Elective classes arranged in gymnastics, dancing, swimming, field-hockey, basket-ball, and other organized games.

For a special four-year professional course designed to prepare graduates for the responsible direction of physical education activities see bulletin of the College of Education.

For a teacher's certificate, minor recommendation, the following elective courses must be taken: 13, 31-32-33, 34-35-36, 43, 54-55-56, 57-58-59, 66-67-68. Course 57-58-59 must be taken in the senior year.

Nine credits are the maximum number that can be gained by taking courses in exercise (Courses 54-55-56, 57-58-59); only one of these courses may be taken for credit in a quarter.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f-2w-3s[1]	Elementary Physical Training	None	Required of all new students	None
11f	Preliminary Hygiene.....	1	Required of all new students	None
13w	Personal Hygiene	3	Soph., jr., sr.	An. Biol. 1-2
19f-20w-21s	Rythmic Expression.....	None	Fr., jr., sr.	None (no registration required)
22f-23w-24s	Sophomore Rythmic Expression	None	Soph.	1-2-3
25f-26w-27s	Sophomore Physical Training	None	Soph.	1-2-3
31f-32w-33s	Folk Dancing and Organized Games	None	Fr., jr., sr.	None
34f-35w-36s	Hockey, Basket-ball, and Baseball	None	Fr., jr., sr.	Permission of director (no registration required)
37f,s	Sophomore Organized Games	None	Soph.	1-2-3
38w	Sophomore Folk Dancing....	None	Soph.	1-2-3
40f,w,s	Sophomore Major Sports....	None	Soph.	1-2-3
43f,w,s	Sophomore Elementary Swimming	None	Soph.	None
44f,w,s	Sophomore Advanced Swimming	None	Soph.	1-2-3
45f,w,s	General Swimming	None	Fr., jr., sr.	None (no registration required)
54f-55w-56s[1]	Intermediate Physical Training	4½	Jr., sr.	1-2-3 or equiv. 25-26-27. Permission of director
57f-58w-59s[1]	Advanced Physical Training	4½	Jr., sr.	54-55-56. Permission of director

Any course in exercise may be taken any quarter by obtaining permission of the department.

[1] The spring quarter of this course is open to those who have not taken the fall and winter quarters' work.

No.	Title	Credits	Offered to	Prerequisite courses
64s	Hygiene of the Family.....	3	Jr., sr.	13, or Med. 3
66f	Anatomy and Kinesiology...	3	Sr.	An. Biol. 1-2
67w	Principles of Gymnastic Exercise	3	Sr.	13, 31-32-33, 34-35-36, 54-55-56, 66
68s	Teachers' Course in Play....	3	Sr.	31-32-33, 34-35-36, 54-55-56

INTRODUCTORY COURSES

1f-2w-3s. ELEMENTARY PHYSICAL TRAINING. Lighter forms of gymnastics, orthopedic exercise, folk dancing, indoor and outdoor games. Study of daily habits of living. Shower-bath fee, $2.50 per quarter. KISSOCK, LADD, TOLG.

11f. PRELIMINARY HYGIENE. The most essential aspects of the care of the body. Twelve lectures, assigned readings, written reports. NORRIS.

13w. PERSONAL HYGIENE. Care of the personal health; elements of anatomy and physiology. NORRIS.

19f-20w-21s. RHYTHMIC EXPRESSION. A scientific, simple, joyous form of exercise with a definite system of technic based upon nature rhythms, with the object of eliminating physical tension, self-consciousness, and repression. LADD.

22f-23w-24s. SOPHOMORE RHYTHMIC EXPRESSION. Shower-bath fee, $2 per quarter. LADD.

25f-26w-27s. SOPHOMORE PHYSICAL TRAINING. Floor work, apparatus and games. Orthopedic and remedial exercise for those not able to take regular class work. Shower-bath fee, $2 per quarter. SCHILL.

31f-32w-33s. FOLK DANCING AND ORGANIZED GAMES. Graded games and folk dances for the school and playground. Two hours a week. KISSOCK.

34f-35w-36s. HOCKEY, BASKET-BALL AND BASEBALL. Hockey in the autumn, basket-ball in winter, baseball in spring. Two hours a week. KISSOCK.

37f,s. SOPHOMORE ORGANIZED GAMES. Suitable in strength for C-D girls. Conducted outdoors when weather permits. Shower-bath fee, $2 per quarter.

38w. SOPHOMORE FOLK DANCING. Twice a week. Shower-bath fee, $2 per quarter.

40f,w,s. SOPHOMORE MAJOR SPORTS. Suitable in strength for A-B girls. Shower-bath fee, $2 per quarter. KISSOCK.

43f,w,s. SOPHOMORE ELEMENTARY SWIMMING. For beginners. Shower-bath fee, $2 per quarter. BAKER.

44f,w,s. SOPHOMORE ADVANCED SWIMMING. Shower-bath fee, $2 per quarter. BAKER.

45f,w,s. GENERAL SWIMMING. For both beginners and advanced swimmers and divers. Shower-bath tickets may be bought of the matron. BAKER.

54f-55w-56s. INTERMEDIATE PHYSICAL TRAINING. Gymnastics, and an election of dancing or a sport. Daily habits of living and written abstracts. If taken for no credit, no reading or written work will be required. Shower-bath fee, $2.50 per quarter. KISSOCK.

57f-58w-59s. ADVANCED PHYSICAL TRAINING. Gymnastics, and an election of dancing or a sport. Written abstracts of prescribed reading. If taken without credit, no reading will be required. Shower-bath fee, $2.50 per quarter. SCHILL.

64s. HYGIENE OF THE FAMILY. Eugenics, prenatal care, maternity and puberty, sex education. NORRIS.

66f. ANATOMY AND KINESIOLOGY. Anatomy of bones, joints, and muscles as it applies to muscular exercise. Study of gymnastic positions and movements from the standpoint of anatomy. TOLG.

67w. PRINCIPLES OF GYMNASTIC EXERCISE. A study of the aims, purposes, and methods of physical education and the arrangement and progression of gymnastic exercises; technic of teaching and practice teaching within the class group. SCHILL.

68s. TEACHERS' COURSE IN PLAY. A study of the various play theories, and play periods of childhood and adolescence, also lectures, discussions, and actual practice in the building, care, and administration of playgrounds and the conduct of play. KISSOCK.

PHYSIOLOGY

MEDICAL SCHOOL

Professors ELIAS P. LYON, FREDERICK H. SCOTT; Associate Professors RICHARD O. BEARD, JESSE F. MCCLENDON; Assistant Professors FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETTIBONE; Instructors CHARLES C. GAULT, ESTHER GREISHEIMER.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Course			
4f,w,su	Human Physiology	5	All	Chem. 10 cred., biol. 10 cred.
	Advanced Courses			
100f-101w, 100s-101su	Physiologic Chemistry.....	12	Sr.	Org. chem.
103f,su	Physiology of Muscle, Nerve, Blood, Circulation, and Digestion	6	Sr.	Org. chem., an. biol.

No.	Title	Credits	Offered to	Prerequisite courses
104w,su	Physiology of the Nervous System and Special Senses.	6	Sr.	Org. chem., an. biol.
110f	Physical Chemistry of Vital Phenomena	3	Sr.	An. biol., 2 courses in chem.
111w	Mineral Metabolism.....	3	Sr.	110
112s	Vitamines	3	Sr.	111
153f,w,s,su	Advanced Physiologic Chemistry	3	Sr.	102
163s	Metabolism	1½ or 3	Sr.	102

For additional courses see the bulletin of the Medical School.

INTRODUCTORY COURSE

4f,w,su. HUMAN PHYSIOLOGY. Lectures and laboratory. LYON, BEARD, GREISHEIMER.

ADVANCED COURSES

100f-101w; 100s-101su. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta and metabolism. PETTIBONE, KINGSBURY, GREISHEIMER, and Assistants.

103f,su. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, AND DIGESTION. SCOTT, MCCLENDON.

104w,su. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES. Respiration, metabolism, nutrition, and excretion. LYON, SCOTT, BEARD, MCCLENDON.

110f. PHYSICAL CHEMISTRY OF VITAL PHENOMENA. Osmotic pressure surface tension, electric conductivity, hydrogen-ion concentration. MCCLENDON.

111w. MINERAL METABOLISM. Functions of inorganic constituents of the body and changes in mineral metabolism in disease. MCCLENDON.

112s. VITAMINES. Physico-chemical conditions necessary for the preservation of the vitamines during the storage and cooking and other preparation of foods. MCCLENDON.

153f,w,s,su. ADVANCED PHYSIOLOGIC CHEMISTRY. Course arranged by instructors with qualified students for special work. May be taken one or more quarters. PETTIBONE, KINGSBURY.

163s. METABOLISM. Lectures and laboratory work on special phases of metabolism. Lectures may be taken alone; number of students unlimited; laboratory course limited to ten students. PETTIBONE.

POLITICAL SCIENCE

Assistant Professor ALBERT J. LOBB.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f	American Government[1].....	5	Soph., jr., sr.	None
7f,w	State and Local Government...	5	Soph., jr., sr.	1
28s	Business Law[1].....	5	Jr., sr.	10 cred. in pol. sci. or econ.
41s	Rural Government.....	3	All	1

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] Given at University Farm.

INTRODUCTORY COURSES

1f. AMERICAN GOVERNMENT. Organization and actual workings of the national government: nature and origin of the American governmental system. ———

7f,w. STATE AND LOCAL GOVERNMENT. Comparison of American state governments, especially Minnesota; relation of states to the United States and to local units of government; recent experiments such as initiative and referendum, the recall and primaries; social and economic legislation. LOBB.

28s. BUSINESS LAW. A course in business law (arranged for students in the College of Agriculture, Forestry, and Home Economics) including contracts, agency, mortgages, conveyances, and negotiable instruments. LOBB.

41s. RURAL GOVERNMENT. The organization and functions of towns, school districts, villages and counties; the assessment and taxation of property; road laws; and drainage. LOBB.

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Associate Professors RICHARD M. ELLIOTT, WILLIAM S. FOSTER, HERBERT WOODROW;[2] Assistant Professors MABEL R. FERNALD, KARL S. LASHLEY; Instructors FRANCES E. LOWELL, PAUL T. YOUNG.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Course			
1f-2w-3s	General Psychology	9[1]	Soph., jr., sr.	None
	Advanced Courses			
101f-102w-103s	Experimental Psychology....	9	Jr., sr.	1-2-3, 4-5-6
108w-109s	Advanced General Psychology	6	Sr.	101-102-103 or by permission
114w-115s	Human Behavior.....	6	Jr., sr.	1-2-3, 4-5-6, 10 cred. an. biol.

[1] Six credits will be allowed for the first two quarters.

[2] Absent on leave, 1920-21.

No.	Title	Credits	Offered to	Prerequisite courses
119f-120w	Animal Behavior	6	Jr., sr.	1-2-3, 4-5-6, 10 cred. an. biol.
121s	Neuro-Psychology	3	Jr., sr.	1-2-3, 4-5-6, 10 cred. an. biol.
125f-126w	Differential Psychology.....	6	Jr., sr.	1-2-3, 4-5-6
127w-128s	Social Psychology	6	Jr., sr.	1-2-3, 4-5-6
131f-132w	Child Mind.....	6	Jr., sr.	1-2-3, 4-5-6
144f-145w	Abnormal Psychology.....	6	Jr., sr.	1-2-3, 4-5-6

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSE

1f-2w-3s. General Psychology. An introductory survey of psychology; its material, fundamental laws, applications, and relations to other sciences. Elliott, Young.

ADVANCED COURSES

101f-102w-103s. Experimental Psychology. Experimentation in the analysis and measurement of mental phenomena. Assigned reading and reports on special topics. Fernald and others.

108w-109s. Advanced General Psychology. A systematic presentation of the laws of the normal adult mind, based upon study of experimental results. Lectures, recitations and reports. Foster.

114w-115s. Human Behavior. An analysis from the point of view of the objective school of psychologists. Elliott.

119f-120w. Animal Behavior. The development of reaction-systems in animals, with emphasis upon the application of studies of animals to the solution of general problems in physiological psychology. Lashley.

121s. Neuro-Psychology. Specialization of functions in the nervous system in relation to behavior. Discussion from the standpoint of psychology of current theories of integration and localization. Lashley.

125f-126w. Differential Psychology. Important distinguishing characteristics (psychological) of individuals and of groups. Emphasis on experimental and statistical methods of discovering differences and of making comparisons. Each student participates in investigation of definite problems and analysis of results. Fernald.

127w-128s. Social Psychology. A study of the dependence of familiar forms of social organization and behavior upon the fundamental laws of mental activity. The adjustment of the innate mental equipment of the individual to the forms of social groups.

131f-132w. Child Mind. General intelligence and special mental abilities; their development and their relation to heredity, physiological factors, education, speech defects, and delinquency. Lowell.

144f-145w. ABNORMAL PSYCHOLOGY. A systematic review of psychopathology in relation to normal behavior. LASHLEY.

PUBLICATIONS AND RURAL JOURNALISM

Associate Professor WILLIAM P. KIRKWOOD; Extension Specialist EDWIN C. TORREY.

General statement.—The aim of this division is to give practical training in agricultural journalism and in agricultural publicity and bulletin-writing.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
10f-11w-12s	Agricultural Journalism	9	Jr., sr.	13-14-15, 16-17
19s	Agricultural Publicity	3	Jr., sr.	Rhet. 19 cred. or rhet. 9 cred., Eng. 9 cred.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSES

10f-11w-12s. AGRICULTURAL JOURNALISM. Gathering and writing agricultural news and writing articles for the agricultural press and other class papers; farm paper editing. Lectures and practical work. KIRKWOOD.

19s. AGRICULTURAL PUBLICITY. Mediums and methods through which information may be brought to the attention of communities and people of the open country. KIRKWOOD.

RHETORIC

Assistant Professors ROBERT C. LANSING, HARRY J. BURTIS; Instructors LIONEL CROCKER, RUTH MOHL.

General statement.—Rhetoric credits will not be granted officially until the close of the second quarter of the senior year.

Any instructor who finds that a student is deficient in English will submit the name of the student together with the evidence to the chairman of the Students' Work Committee. If the evidence warrants, the committee will send the student to the Section of Rhetoric for such additional work in English as is needed. This work the student must take, without credit, to validate his freshman and sophomore rhetoric credits.

Students whose work in the rhetoric courses shows at any time an inadequate knowledge of the conventions of English will be required to drop the course and enter a class in elementary rhetoric. These students will be required to complete 22 credit hours in rhetoric.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s	Rhetoric I	3	All	None
2f,w,s	Rhetoric II	3	All	1
3f,w,s	Rhetoric III	3	All	2
4f,w,s	Elementary Rhetoric	3	All	None
11f,w,s	Argumentation	5	Soph., jr., sr.	3
22f,w,s	Public Speaking	5	Soph., jr., sr.	3
24f,w,s	Adv. Public Speaking	3	Soph., jr., sr.	22

INTRODUCTORY COURSES

1f,w,s. RHETORIC I. Note-taking, gathering and organizing material, oral and written exposition, paragraph structure, supplementary reading. LANSING, CROCKER, MOHL.

2f,w,s. RHETORIC II. Sentence structure, diction, exposition, supplementary reading. LANSING, CROCKER, MOHL.

3f,w,s. RHETORIC III. Description, narration, supplementary reading. LANSING, CROCKER, MOHL.

4f,w,s. ELEMENTARY RHETORIC. Elementary grammatical and rhetorical principles. MOHL.

11f,w,s. ARGUMENTATION. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating. LANSING, BURTIS, MOHL.

22f,w,s. PUBLIC SPEAKING. A practical course in fundamentals of speech-making. Rules of order and practice in conducting assemblies included. BURTIS.

24f,w,s. ADVANCED PUBLIC SPEAKING. A course in preparing and delivering occasional addresses and informal lectures. BURTIS.

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor EVERETT W. OLMSTED; Associate Professors RALPH E. HOUSE, RUTH S. PHELPS; Assistant Professors FRANCIS B. BARTON, JULES T. FRELIN, EDWARD H. SIRICH; Professorial Lecturer ANTONIO HERAS; Instructors SOLOMON M. DELSON, CHARLES B. DRAKE, MARGUERITE GUINOTTE, SAMUEL VASCONCELOS, GUSTAVE VAN ROOSBROECK.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s-2w,s,f	Beginning French	10[1]	All	None
3f,w,s-4w,s,f	Intermediate French	10	All	1-2 or 2 yrs. H.S.
20f,s	Oral and Written French	3	All	3-4 or 3 yrs. H.S.
21f-22w-23s	Survey of French Literature.	9[1]	All	3-4 or 3 yrs. H.S.

[1] The full course must be completed before credit will be allowed.

No.	Title	Credits	Offered to	Prerequisite courses
50f-51w-52s	French Conversation.....	3[1]	Jr., sr.[2]	3-4 or 3 yrs. H.S.
53f-54w-55s	French Composition.....	10[1]	All	None
1f,w,s-2w,s,f	Beginning Spanish.....	3[1]	Jr., sr.[2]	3-4 or 3 yrs. H.S.
3f,w,s-4w,s,f	Intermediate Spanish.....	10	All	1-2 or 2 yrs. H.S.
20f,s	Oral and Written Spanish...	3	All	3-4 or 3 yrs. H.S.
50f-51w-52s	Spanish Conversation	3[1]	Jr., sr.[2]	3-4 or 3 yrs. H.S.
53f-54w-55s	Spanish Composition	3[1]	Jr., sr.[2]	3-4 or 3 yrs. H.S.
65f-66w-67s	Survey of Spanish Literature	9[1]	Jr., sr.[2]	3-4 or 3 yrs. H.S.

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

[1] The full course must be completed before credit will be allowed.

[2] Open without petition to sophomores who can satisfy the requirements.

INTRODUCTORY COURSES

French

1f,w,s-2w,s,f. BEGINNING FRENCH. Pronunciation, grammar, oral exercises, translation. FRELIN, DELSON, GUINOTTE.

3f,w,s-4w,s,f. INTERMEDIATE FRENCH. Review of grammar, connected prose composition, conversation, and reading of representative authors. FRELIN, GUINOTTE.

20f,s. ORAL AND WRITTEN FRENCH. Practical French conversation and composition. BARTON.

21f-22w-23s. SURVEY OF FRENCH LITERATURE. This course will outline the history of French literature from 1600 to present day, and is prerequisite for the courses devoted to special periods. Representative texts will be read. PHELPS, SIRICH, VAN ROOSBROECK.

50f-51w-52s. FRENCH CONVERSATION. A small amount of outside preparation will be required. BARTON, FRELIN, GUINOTTE.

53f-54w-55s. FRENCH COMPOSITION. BARTON, FRELIN, GUINOTTE.

Spanish

1f,w,s-2w,s,f. BEGINNING SPANISH. Pronunciation, grammar, oral exercises and translation. OLMSTED, DRAKE, VASCONCELOS.

3f,w,s-4w,s,f. INTERMEDIATE SPANISH. Review of grammar, conversation, connected prose composition, and reading of representative authors. HOUSE, VASCONCELOS.

20f,s. ORAL AND WRITTEN SPANISH. Practical Spanish conversation and composition. DRAKE.

50f-51w-52s. SPANISH CONVERSATION. A small amount of outside preparation will be required. HERAS.

53s-54w-55s. SPANISH COMPOSITION. HERAS.

65f-66w-67s. SURVEY OF SPANISH LITERATURE. An outline of the history of Spanish literature from 1500 to the present day, based upon texts and collateral reading. Prerequisite for courses devoted to special periods. HOUSE.

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Professor ARTHUR J. TODD;[1] Acting Chairman FRANK J. BRUNO; Associate Professors LUTHER L. BERNARD, MANUEL C. ELMER; Assistant Professors ROSS L. FINNEY, GUSTAV A. LUNDQUIST; Lecturers OTTO W. DAVIS, WILLIAM W. HODSON, ARTHUR H. TAYLOR, EDWARD F. WAITE; Instructors LOUIS A. BOETTIGER, CHARLES E. LIVELY; Teaching Fellow ANDREW N. WRAY; Supervisors of Field Work CAROLINE BEDFORD, MARION TEBBETS.

COURSES

No.	Title	Credits	Offered to	Prerequisite courses
	Introductory Courses			
1f,w,s[2]	Introduction to Sociology ...	3 or 5	Soph., jr., sr.	None
6f,w,s	Modern Social Reform Movements	3	Soph., jr., sr.	1
14f,w,s	Rural Sociology.....	3	Soph., jr., sr.	1[3]
51f,w	Background for Dependency and Defectiveness.....	3	Jr., sr.	10 cred. in soc.; or 10 cred. in soc. and pol. sci., econ. or psych.
52w,s	Treatment of Dependents and Defectives	3	Jr., sr.	51
53w,s	Treatment of Delinquents...	3	Jr., sr.	10 cred. in soc.; or 10 cred. in soc. and pol. sci., econ. or psych.
55w	Housing Problems.....	3	Jr., sr.	10 cred. in soc. and pol sci., econ. or psych.
60w	Child Welfare.....	3	Jr., sr.	51 and 52
61s	Legal Protection of the Child	3	Jr., sr.	60
99f,w,s	Supervised Field Practice Work	3	Jr., sr.	Directors consent
	Advanced Courses			
100f	Social Psychology.....	3	Jr., sr.	1 and Psychol. 1-2-3
101w	Social Organization.....	3	Jr., sr.	3 courses, 1 of which may be in psychol., philos., econ., pol. sci., anth., or educ.
102s	Social Control.....	3	Jr., sr.	Same as for 101
110w	Community Organization and Social Work in Small Towns	2	Jr., sr.	10 cred. in soc.; or 10 cred. in soc. and pol. sci., econ. or psych.

[1] Absent on leave, 1920-21.

[2] A 3-credit course, open only to students in Agriculture, Forestry, and Home Economics will be offered at University Farm in the fall and spring quarters.

[3] No prerequisite for seniors in the College of Agriculture, Forestry, and Home Economics.

No.	Title	Credits	Offered to	Prerequisite courses
114s	Rural Social Institutions....	3	Jr., sr.	10 cred. in soc.; or 10 cred. in soc. and pol. sci., econ. or psych.
119f	The Family.....	3	Jr., sr.	3 courses, 1 of which may be in home econ., econ., pol. sci., amer. and anthropol. or law
120f	Social Progress	3	Jr., sr.	3 courses, 1 of which may be in econ., pol. sci., educ., philos., psych. or anth.
122w	Methods of Social Investigation	3	Jr., sr.	3 courses
123s	Social Statistics	3	Jr., sr.	122
128s	Charitable Administration, Finance, and Publicity.....	2	Jr., sr.	3 courses
130s	Technic of Family Treatment	2	Jr., sr.	51, 52
132s	Juvenile Courts and Probation	2	Jr., sr.	51, 52, 53
133f	Medical Social Service.....	3	Jr., sr.	51, 52 and one other course numbered above 50
138w-139s	Mental Case Work.....	6	Jr., sr.	51, 52 and one other course numbered above 50
140w	History of Social Theory...	3	Jr., sr.	Same as for 101
141s	Contemporary Social Theory.	3	Jr., sr.	140
180f	Seminar in Educational Sociology	2	Jr., sr.	1, 6 and 120

For additional courses see the bulletin of the College of Science, Literature, and the Arts.

INTRODUCTORY COURSE

1f,w,s. INTRODUCTION TO SOCIOLOGY. Origin and development of human societies; various agencies which have determined the type of social life; social organization, institutions, and progress; bearing of sociology upon other social sciences and arts. Same as Amer. and Anthropol. 1. BERNARD, ELMER, FINNEY, LUNDQUIST, BOETTIGER, LIVELY, WRAY.

6f,w,s. MODERN SOCIAL REFORM MOVEMENTS. A survey of attempts to overcome certain social maladjustments; child labor, the city, bad housing, poverty, degeneracy; movements for public health, industrial democracy, social insurance, protection of infancy and youth, public recreation, etc. ELMER, FINNEY, BOETTIGER, LIVELY.

14f,w,s. RURAL SOCIOLOGY. The background and evolution of country life; rural conveniences, communication, coöperation; rural social institutions, especially the family, school, church and social center; rural

leadership, surveys, organization, social agencies. BERNARD, LUNDQUIST, LIVELY.

51f,w. THE BACKGROUND OF DEPENDENCY AND DEFECTIVENESS. This course considers the conditions in contemporary industrial societies out of which the social problems of the dependent and defective arise. BRUNO.

52w,s. TREATMENT OF DEPENDENTS AND DEFECTIVES. This course reviews the methods used or advocated for the prevention and alleviation of poverty and defectiveness with special emphasis upon the method of family case work. BRUNO.

53w,s. TREATMENT OF DELINQUENTS. The causes of crime; nature of the criminal; criminal procedure; methods of treatment (prisons, reformatories, parole, probation); the juvenile offender; juvenile courts; preventive methods. ELMER.

55w. HOUSING PROBLEMS. An examination of housing evils and their causes; the various movements for the prevention or improvement of bad housing; town- and city-planning; garden cities. Lectures, readings, field work, and essay. DAVIS.

60w. CHILD WELFARE. Study of social obligations to the child; development of the child-saving movement in the United States; infant and child mortality, recreation, education; courts, institutions, societies, and other public efforts for the child. TAYLOR.

61s. LEGAL PROTECTION OF THE CHILD. A study of the relation of law to child welfare. A survey of existing children's protective legislation, of its administration and its future development. HODSON.

99f,w,s. SUPERVISED FIELD PRACTICE WORK. This is a course in technic open only to students who have taken Courses 51, 52, 53, 55, 60, 110, 130, 132, 133, or 138, and who wish to strengthen their experience in case work. Time and place arranged. BEDFORD.

ADVANCED COURSES

100f. SOCIAL PSYCHOLOGY. (Primarily for sociology students.) The social attitudes; their development and modification under social pressures, the interactions of individuals and groups. BERNARD.

101w. SOCIAL ORGANIZATION. The organization and structure of social groups; the selection of group types and values; the disorganization and reorganization of institutions; purposive social organization. BERNARD.

102s. SOCIAL CONTROL. Nature, purpose and methods of social control; institutional and non-institutional controls; the evolution of sanctions in social control; the revision of the social controls under the influence of modern science. BERNARD.

110w. METHODS OF COMMUNITY ORGANIZATION AND SOCIAL WORK IN SMALL TOWNS AND COUNTRY. Concrete problems and methods are emphasized. BERNARD.

114s. RURAL SOCIAL INSTITUTIONS. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. For advanced students. Lectures, discussion, reports. LUNDQUIST.

119f. THE FAMILY. The evolution of the family; its various forms and their relation to other social institutions; the service of the family in social evolution; contemporary problems of the family (standards of living, birth rate, feminism, etc.). ELMER.

120f. SOCIAL PROGRESS. A study of the basis for social progress in human nature; analysis of fundamental social institutions with regard to their contributions to human advance; necessary social readjustments to convert drift into progress. BERNARD.

122w. METHODS OF SOCIAL INVESTIGATION. Methods of gathering and presenting community facts; social statistics; social surveys. Lectures, problems, and field work. ELMER.

123s. SOCIAL STATISTICS. A study and analysis of social statistics and their bearing upon group life. The course is especially designed to give social workers and public health officials the training necessary to carry on their work successfully. ELMER.

128s. CHARITABLE ADMINISTRATION, FINANCE, AND PUBLICITY. A technical study of methods of organizing charitable agencies, of financing them, and of making the public aware of their work. Lectures and practice work. DAVIS.

130s. TECHNIC OF FAMILY TREATMENT. An intensive study of social case work as the basis of practical dealing with problems of dependency and defectiveness. Lectures and conferences. BRUNO.

132s. JUVENILE COURTS AND PROBATION. Primarily a course in probation practice work, but prefaced by lectures on the social and legal aspects of the juvenile court and probation. BRUNO, WAITE.

133f. MEDICAL SOCIAL SERVICE. A course open only to students who are properly grounded in case work and who wish to specialize in this field. ———

138w-139s. MENTAL CASE WORK. A study of mental abnormality and its treatment through case work. Lectures and clinical instruction. (Registration only with consent of the director.)

140w. History of Social Theory. A rapid survey of the leading social theories from the time of the Greeks, with special reference to the development of sociology in the nineteenth century. The theories are related to their social backgrounds. Bernard.

141s. Contemporary Social Theory. An intensive study of selected types of social theory of the present, open to students who have taken Course 140. Bernard.

180f,w,s. Seminar in Educational Sociology. Problems in the social aspects of educational theory and practice. Finney.

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