KANSAS STATE
AGRICULTURAL COLLEGE BULLETIN

VOLUME VI APRIL 1, 1922 NUMBER 2

CATALOGUE

FIFTY-NINTH SESSION, 1921-'22

WITH ANNOUNCEMENTS FOR 1922-'23

MANHATTAN, KANSAS
Published by the College

PRINTED BY KANSAS STATE PRINTING PLANT
B. P. WALKER, STATE PRINTER
TOPEKA 1922
9-2605

The Kansas State Agricultural College Bulletin is published on the first and fifteenth of each month by the Kansas State Agricultural College, Manhattan, Kan., to which requests for copies of the publication should be addressed. Entered as second-class matter November 6, 1916, at the post office at Manhattan, Kan., under the Act of August 24, 1912.

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The College Calendar

SUMMER SCHOOL, 1922

June 2, Friday.—Registration of students for Summer School begins at 8 a. m.
June 3, Saturday.—*All classes meet according to schedule.
June 3 to Aug. 4, Saturday to Friday.—Summer School in session, nine weeks.

FIRST SEMESTER, 1922-1923

Sept. 8, Friday.—All members of the instructional force on duty.
Sept. 9, Saturday.—Meeting of assigners with committee on schedule at 2 p. m.
Sept. 9, Saturday.—Meeting of assigners with deans at 3 p. m.
Sept. 11, Monday.—Admission and registration of students begin at 8 a. m.
Sept. 11, Monday.—† Special courses for auto mechanics, tractor operators, machinists, blacksmiths, foundrymen, and carpenters begin.
Sept. 12, Tuesday.—Housekeepers' Course begins; registration at 8 a. m.
Sept. 13, Wednesday.—Registration of students closes at 11 a. m.
Sept. 13, Wednesday.—Opening convocation, 11 a. m. to 12 m.
Sept. 13, Wednesday.—All classes meet according to schedule, beginning at 1 p. m.
Oct. 7, Saturday.—Examinations to remove conditions.
Oct. 14, Saturday.—Scholarship deficiency reports to students and deans are due.
Nov. 11, Saturday.—Midsemester scholarship deficiency reports to students and deans are due.
Nov. 29, Wednesday.—Thanksgiving vacation begins at 12 m.
Dec. 2, Saturday.—Thanksgiving vacation closes at 6 p. m.
Dec. 20, Wednesday.—Housekeepers' Course closes at 12 m.
Dec. 20, Wednesday.—Winter vacation begins at 6 p. m.
Jan. 2, 1923, Tuesday.—† Special courses for auto mechanics, electricians, tractor operators, machinists, blacksmiths, foundrymen and carpenters begin.
Jan. 3, Wednesday.—Winter vacation closes at 6 p. m.
Jan. 8, Monday.—Short Course in Agriculture and Creamery Short Course begin.
Jan. 19 to 27, Friday to Saturday.—Examinations at close of semester.
Jan. 27, Saturday.—First semester closes at 11 a. m.
Jan. 29, Monday.—Semester deficiency reports to students and deans are due.

SECOND SEMESTER, 1922-1923

Jan. 30, Tuesday.—Admission and registration of students begin at 8 a. m.
Jan. 30, Tuesday.—Housekeepers' Course begins; registration at 8 a. m.
Feb. 1, Thursday.—*All classes meet according to schedule, beginning at 8 a. m.
Feb. 5 to 10, Monday to Saturday.—Farm and Home Week.
Feb. 10, Saturday.—Reports of all grades for first semester due in registrar's office.
Feb. 22, Thursday.—Holiday, Washington's Birthday.
Feb. 24, Saturday.—Examinations to remove conditions.
Mar. 3, Saturday.—Scholarship deficiency reports to students and deans are due.
Mar. 3, Saturday.—Short Course in Agriculture and Creamery Short Course close at 12 m.
Mar. 31, Saturday.—Midsemester scholarship deficiency reports to students and deans are due.
April 19, Thursday.—Announcement of elections of seniors to Phi Kappa Phi.
May 8, Tuesday.—Housekeepers' Course closes at 12 m.
May 16 to 23, Wednesday to Wednesday.—Examinations for seniors.
May 22 to 29, Tuesday to Tuesday.—Examinations at close of semester.
May 25, Friday.—Commencement Exercises, The Vocational School.
May 30, Wednesday.—Holiday, Decoration Day.
May 31, Thursday.—Commencement Day.
June 2, Saturday.—Semester deficiency reports to students and deans are due.
June 14, Thursday.—Reports of all grades for second semester due in registrar's office.

SUMMER SCHOOL, 1923

June 1, Friday.—Registration of students for Summer School begins at 8 a. m.
June 2 to Aug. 3.—Saturday to Friday.—Summer School in session, nine weeks.
Aug. 17, Friday.—Reports of all grades for Summer School due in registrar's office.

FIRST SEMESTER, 1923-1924

Sept. 10, Monday.—Admission and registration of students begin at 8 a. m.
Sept. 12, Wednesday.—Registration of students closes at 11 a. m.

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* Students must be present at the first meeting of each class or render a reasonable excuse. Failure to take out an assignment is not accepted as an excuse for absence from classes. A fee of one dollar is charged those who enroll after the time set for close of registration unless a reasonable excuse is offered.

† Similar courses begin the first Monday of October, November, December, January, February, March, April, May, June, and July. Instruction in the special short courses is suspended during the month of August and the first two weeks of September.

Aims and Purposes of the College

The Kansas State Agricultural College has three chief aims: to give to the young men and women of Kansas a high standard of collegiate training in agriculture, engineering, home economics, general science, and veterinary medicine; to investigate, through its experiment stations, the agricultural and industrial problems of Kansas; and, by means of its extension division, to carry the full benefits of the College to the remotest parts of the state.

In all the collegiate curricula particular pains are taken that each student, in connection with the scientific and technical instruction necessary to his vocation, be given thorough training in fundamental, cultural subjects which promote sound thinking and good citizenship. The College aims to turn back to the state the type of citizen who is straight-thinking in all lines and a particularly valuable leader in some definite field of human activity. Its chief aim is the development of intelligent, effective leadership.

Besides the full collegiate courses the College offers short courses in many fields of agricultural and industrial activity. These courses do not lead to degrees. Their aim is to give in the shortest possible time the gist of the practical training needed by the efficient artisan.

The second important aim of the Kansas State Agricultural College is, to serve the state by investigating in a scientific manner the state's problems in agriculture and the industries. This work is accomplished through the various agricultural and engineering experiment stations. All investigational work is directly connected with the educational work of the College, so that the students are given the widest opportunity for appreciating the true value of scientific investigation. Many opportunities in the United States Department of Agriculture and in the various experiment stations of the country are thus opened to such students as show interest and skill in investigational work.

In addition to the regular instructional work conducted on the campus, the College realizes its third important aim through the Division of College Extension. This is a highly organized system of agricultural education and service carried directly to the homes of the farmers. The work has been so highly developed within the last few years that the College has come to look upon the whole state as its campus. In addition to the regular staff of the Division of College Extension, many members of the College board of instruction and the staff of the experiment stations give several weeks of each year to this public work among the people of the state.

Grounds, Buildings and Equipment

The College campus occupies a commanding and attractive site upon an elevation adjoining the western limits of the city of Manhattan, with motor-car service into town and to the railway stations. The grounds are tastefully laid out according to the designs of a landscape architect, and are extensively planted with a great variety of beautiful and interesting trees, arranged in picturesque groups, masses, and border plantings, varied by banks of shrubbery and interspersed with extensive lawns, gardens, and experimental fields. Broad, well-shaped macadamized avenues lead to all parts of the grounds. Cement walks connect the buildings with one another and with the entrances. Including the campus of 160 acres, the College owns 1,398 acres of land at Manhattan, valued at $340,600. Outside the campus proper, all of the land is devoted to educational and experimental work in agriculture. Within the College grounds, most of the space not occupied by buildings and needed for drives and ornamental plantings is devoted to orchards, forest and fruit nurseries, vineyards, and gardens. A number of fields in the northern and western portions of the campus are used for general experimental work by various departments.

The College buildings, twenty-two in number, are harmoniously grouped, and are uniformly constructed of limestone obtained from the College quarries. These buildings are listed below.

ANDERSON HALL. Erected, 1879; cost, $79,000; dimensions, 152 x 250 feet; two stories and basement. Contains the offices of administration of the College, a social center hall, the College post office, offices of the Division of College Extension and of the Department of Student Health, and offices and classrooms of the Departments of Applied Art, Economics, Education, English, Mathematics, and Modern Languages. Value of equipment, $46,947.*

AUDITORIUM. Erected, 1904; cost, $40,000; dimensions, 113 x 125 feet. Has a large stage with drop curtain and scenery. Seating capacity, 2,300. Contains also the offices and music rooms of the Department of Music. Value of equipment, $15,696.

CAFETERIA. Erected, 1921; cost, $125,000; two stories and basement. Basement occupied by receiving and storage rooms for the cafeteria, dishwashing room, refrigeration machinery room, pipe room, locker rooms, and bakery. The first floor is devoted to the cafeteria, including kitchen, dining room, two offices, and lobbies. On the second floor are a tea room, with a main dining room, kitchen, three alcoves, receiving room, serving room, lobby and coat room, office, two classrooms, and the household-management laboratory.

CHEMISTRY ANNEX. Erected, 1876; cost, $8,000; dimensions, 35 x 110 and 46 x 175 feet, in the form of a cross. Originally erected as a chemical laboratory. Reconstructed at a cost of $5,000 after a fire in 1900, the building was used from 1902 to 1911 as a women's gymnasium; since 1911, used by the Department of Chemistry. Value of equipment, $4,128.

DAIRY COMMISSION HALL. Erected, 1888; cost, $5,000; dimensions, 30 x 30 feet; one story and basement. Used for many years by the Department of Horticulture and Entomology, then for horticultural work when that was made a separate department. Contains offices occupied by the state dairy commissioner. Value of equipment, $1,609.

DAIRY HALL. Erected, 1904; cost, $15,000; dimensions, 72 x 103 feet, one story and basement. Contains butter-manufacturing rooms, hand-separator room, laboratory, classroom, three offices, and two refrigerating rooms. Occu-

* The figures for equipment are taken from the inventories prepared by the state accountant's office previous to September 1, 1921.

pied entirely by the Department of Dairy Husbandry. Value of equipment, $9,763.

DENISON HALL. Erected, 1902; cost, $70,000; dimensions, 96 x 166 feet; two stories and basement. The east wing is occupied throughout by the laboratories, classrooms and offices of the Department of Chemistry. The west wing is occupied by the Department of Physics. Value of equipment: Chemistry, $26,390; Physics, $18,108.

ENGINEERING HALL. Erected: east wing, 1909; main portion, 1920. Cost, $270,000. Dimensions: main portion, 60 x 236; east wing, 113 x 200 feet. Three stories in height, but much of the east wing built on the gallery plan rather than by complete floor separation into different stories. This building contains the general offices and library of the Division of Engineering, and the offices, drafting rooms and laboratories of the Departments of Agricultural Engineering, Applied Mechanics, Architecture, Civil Engineering, Electrical Engineering, and Mechanical Engineering. The engines, turbines, generators and boilers that furnish heat, light and power for the College are also installed in this building. Value of equipment, $188,772.

ENGINEERING SHOPS. These consist of several connected structures, erected at different times. The original building, now used as the woodworking shop, was erected in 1876; a series of additions having later been successively made, the present group is the result. The cost of the whole amounts to $35,000. A portion of the building is two stories high. On the upper floor, which has a floor area of 9,260 square feet, are classrooms, drafting rooms, pattern storage room, and offices of the Departments of Applied Mechanics and Machine Design, Mathematics, and Shop Practice. The woodworking shop (35 x 219 feet) is equipped with the necessary bench tools and woodworking machinery. Adjoining is the machine shop (40 x 170 feet), supplied with benches and tools and amply equipped with the necessary machine tools. The repair section of the automechanics laboratories (70 x 80 feet) joins the machine shop. The blacksmith shop (50 x 100 feet) contains 35 forges of modern type, connected with power blast and down-draft exhaust. Adjoining is the lecture hall, with demonstration forge and equipment. The iron foundry (27 x 100 feet) and brass foundry (24 x 34 feet) are well supplied with the necessary equipment. The wash and locker room (36 x 40 feet) contains 250 steel lockers. A general supply room (22 x 24 feet) is conveniently located for storing the necessary small supplies. Value of equipment, $56,489.

FAIRCHILD HALL. Erected, 1894; cost, $67,750; dimensions, 100 x 140 feet; two stories, basement, and attic. On the first floor are the College Library and reading rooms, a newspaper reading room, offices of the Librarian and his assistants, and the general museum. On the second floor are the offices, classrooms and laboratories of the Departments of Zoölogy, Entomology, and History and Civics. The museums of natural history are placed here also. The basement is occupied largely by recitation rooms and offices of the Department of History and Civics. Value of equipment: Library, $245,115; other departments, $46,320.

FARM BARN. Erected, 1913; cost, $25,000; dimensions, 80 x 160 feet; two stories and basement. Consists of three sections, arranged like the letter H, and a glazed tile silo of 200 tons capacity. The west wing contains nine box stalls and twenty-six single stalls, equipped with sanitary feed mangers and racks, and is designed especially for the housing of horses. The east wing contains twelve box stalls and thirty single stalls for the breeding cattle and the show herd. The central section has an office, feed rooms, a washing floor, and a basement containing the engine room. The loft, to which a driveway leads, has storage space for ten carloads of grain and 100 tons of hay and straw and contains the grinding apparatus. This barn is used by the Department of Animal Husbandry.

FARM MACHINERY HALL. Erected, 1873; cost, $11,250; dimensions, 46 x 95 feet; two stories. The first building erected on the present campus. Originally

designed as a College barn, and first used for that purpose. Later used as a general College building, then by the Department of Botany, and afterwards by the Department of Veterinary Medicine. The first floor, a large hall, was used by the Department of Military Science for many years as an armory. The entire building has been given over for the use of the Department of Agricultural Engineering, and is filled with all types of farm machinery. Value of equipment, $1,887.

HOME ECONOMICS HALL. Erected, 1908; cost, $70,000; dimensions, 92 x 175 feet; two stories and basement. The first floor and basement are occupied by the laboratories, classrooms, and offices of the Departments of Food Economics and Nutrition, and Household Economics; the second floor is occupied by the laboratories, classrooms, and offices of the Department of Clothing and Textiles. Value of equipment, $31,604.

HORTICULTURAL BARN. Erected, 1917; cost, $1,500; dimensions, 38 x 55 feet. Two stories, first story stone, second story frame. This building is located one mile west of the College campus.

HORTICULTURAL HALL. Erected, 1907; cost, $50,000; dimensions, 72 x 116 feet; two stories and basement. This building is used by the Departments of Botany and Plant Pathology, and Horticulture. Its classrooms, laboratories, museums, and equipment are modern and ample. Value of equipment, $32,047.

ILLUSTRATIONS HALL. Erected, 1877; cost, $4,000; dimensions, 32 x 80 feet; one story and basement. At an early period used as a horticultural hall; later the headquarters for general College repairs; since the summer of 1919 used by the Department of Illustrations. Value of equipment, $3,799.

INFIRMARY. Erected, previous to 1884; rebuilt, 1919; dimensions, 34 x 34 feet; two stories. Originally a farm house, later used as dwelling by the professor of agriculture and more recently by the custodian. Contains separate wards for men and women, five rooms in each ward. Value of equipment, $1,327.

KEDZIE HALL. Erected, 1897; cost, $16,000; dimensions, 70 x 84 feet; two stories and basement. Used from its erection till 1908 by the Departments of Domestic Science and Domestic Art. Basement occupied by the printing plant; first floor taken up by the cafeteria since the summer of 1915, and by offices of the Department of English; second floor divided into general classrooms and offices used by the Departments of Industrial Journalism and Printing, and English. Value of equipment: Cafeteria, $10,874; English, $894; Industrial Journalism and Printing, $21,345.

NICHOLS GYMNASIUM. Erected, 1911; cost, $122,000; dimensions, 102 x 221 feet; three stories and basement. The building consists of a main section and two wings. The main section (85 x 141 feet), consisting of two stories and a basement, is used as a men's gymnasium and armory, and contains a running track, sixteen laps to the mile. The east half of the basement of the main section contains a swimming pool, baths, rest room, etc., for women; the west half contains a swimming pool and baths for men. The east wing (40 x 102 feet) contains the women's gymnasium, classrooms and offices of the Department of Military Training, and several literary society halls. The west wing (40 x 102 feet) contains the offices of the director of athletics and physical education, a large locker room for men, and several literary society halls. This building is constructed on the old armory-castle type and is modern in every respect. Value of equipment, $14,262.

VETERINARY HALL. Erected, 1908; cost $70,000; dimensions, 133 x 155 feet; two stories and basement. Occupied by the laboratories, demonstration and dissecting rooms, classrooms, and offices of the Departments of Anatomy and Physiology, Bacteriology, Pathology, and Vaccine Laboratories, and by the offices of the dean of the Division of Veterinary Medicine. Value of equipment, $52,468.

VOCATIONAL SCHOOL HALL. Erected, 1900; cost, $25,000; dimensions, 90 x 95 feet; two stories and basement. Occupies the original site of the president's house, destroyed by lightning in 1896. Contains classrooms and offices of the Vocational School and of the Department of Public Speaking. Value of equipment, $5,625.

WATERS HALL. Erected, 1912; cost of portions now completed, $125,000; cost of building when developed and completed as planned, $500,000. The completed building will consist of a central portion (130 x 80 feet), with basement and three stories; of two wings (each 80 x 169 feet), with basement and three stories, and with a subbasement under half of the east wing; and of a stock-judging pavilion placed back of the central portion and between the wings. This pavilion is now completed, and contains tie and box stalls and two large stock-judging rooms (45 x 100 feet), each having a seating capacity of 475. Each of these rooms may be divided into two, with a passage between, by the use of curtains. The east wing of the building is used by the Departments of Agricultural Economics, Agronomy, Animal Husbandry, Milling Industry, and Poultry Husbandry. This wing contains, besides offices and recitation rooms of these departments and the general offices of the Agricultural Experiment Station and of the dean of the division, a complete small flour mill, and laboratories for grain judging. Value of equipment, $66,920.

In addition to the substantial stone buildings mentioned above the College has a number of other buildings, among them the following:

EXPERIMENT STATION BUILDING. Erected, 1918; dimensions, 40 x 176 feet; two stories. Built as barracks No. 4 for the S. A. T. C., now used by the Agricultural Experiment Station. Value of equipment, $1,771.

GENERAL-PURPOSE BUILDING. Erected, 1918; dimensions, 40 x 80 feet; two stories. Built as barracks No. 6 for the S. A. T. C. This building is used by the Department of Electrical Engineering and for the storage of auto parts. Value of equipment, $394.

GREENHOUSES. Erected, 1909; cost, $7,000; dimensions, 114 x 150 feet. Contains six sections used by the various departments as follows: Horticulture, three; Botany, one; Agronomy, one; Entomology and Zoölogy, one. Value of equipment, $6,043.

MESS HALL. Erected, 1918; dimensions, 42 x 176 feet; two stories. Built for the S. A. T. C. as mess hall (barracks No. 5) and still used for that purpose. The upper floor is used by the Departments of Civil Engineering and Shop Practice. Value of equipment, $2,847.

PLANT MUSEUM. Erected, 1907; cost, $2,500; dimensions, 20 x 100 feet. Used by the Department of Horticulture. Contains a large number of rare growing plants, including many subtropical species. Value of equipment, $440.

REPAIR SHOP. Erected, 1918; dimensions, 40 x 176 feet; one story. Built as barracks No. 1 for the S. A. T. C. Value of equipment, $3,333.

SERUM BARN. Erected, 1914; cost, $3,000; dimensions, 92 x 96 feet; contains 30 pens, each 8 x 12 feet, and two feed rooms of the same dimensions. This is a frame and cement building situated three-quarters of a mile north of the College campus.

SERUM PLANT. Erected, 1914; cost, $7,000; constructed of brick; dimensions, 20 x 60 feet; two stories. Value of equipment, $7,885.

TRACTION ENGINE LABORATORIES. Erected, 1918; cost, $20,000; two buildings, each 40 x 176 feet. These are two frame buildings on concrete foundations, built originally as barracks Nos. 2 and 3 for the S. A. T. C. Value of equipment, $2,417.

POWER AND WATER SYSTEMS. The College maintains and operates its own modern heat, light, power, water and sewer systems. A central boiler plant

of 2,400 horsepower furnishes steam for both the heating system and the power plant. The central power plant contains steam engines and turbines, totaling 700 horsepower, connected to electric generators which furnish power and light for the entire campus. A complete system of underground tunnels connects the various buildings and through these are carried the steam mains and electric cables which distribute steam and electrical energy to the different parts of the campus.

The waterworks pump house contains electric motor-driven pumps of an aggregate capacity of 600 gallons per minute. Cast-iron water mains distribute this over the campus, and a steel tank of 110,000 gallons capacity supported on a steel tower provides a reserve supply.

In addition to the totals for equipment listed above, there are other items which might be mentioned, *e. g.,* live stock valued at $64,431. Miscellaneous equipment to the value of $38,738 is located on the agronomy farm, in the hog barns, animal-husbandry barn, nutrition barns, sheep barn, slaughter house, botany field house, traction shed, dairy and calf barns, machine shed, horse barn, apiary building, pumping plants, the Ellen Richards Lodge (rented quarters), the Music Annex (rented quarters), at the poultry farm, the old hog-cholera plant, and in the zoölogy animal house.

The College Library

The general College Library consists of all books belonging to the College, including the library of the Agricultural Experiment Station, which is incorporated with it. On January 1, 1922, the Library contained 72,100 bound volumes, besides much unbound material. It receives currently about four hundred serial publications. As a depository the Library receives the documents and other publications of the United States government. The books are classified according to the Dewey system and are indexed in a dictionary card catalogue.

All students, as well as all officers of administration and instruction, have the privilege of direct access to the book stacks. The Library is primarily for free reference use, but the privilege of drawing books is accorded to all those connected with the College as registered students or as members of the Faculty. Books not specially reserved may be drawn for home use for two weeks. All books are subject to recall at any time.

General reference books, books reserved for classes, general periodicals, and certain other groups of books are to be consulted only in the reading rooms. They may not be loaned from the Library except when the reading rooms are closed. They must then be returned to the Library by the time it next reopens. Any violation of the regulations of the Library subjects the offender to a fine, or to a withdrawal of library privileges, or to both, according to the gravity of the offense. More serious offenses, such as mutilation or theft of books or periodicals, are considered just causes for suspension or expulsion of the offender, who is also required to make good the loss incurred.

READING ROOMS. Three reading rooms are maintained in connection with the Library; the general reference room, containing encyclopedias, dictionaries, atlases, bibliographies, and general reference books; the special reference room, containing books reserved for classes; and the periodical room, containing current magazines and the important daily and weekly Kansas newspapers. These rooms are freely open to the students and to the public for purposes of reading and study.

DIVISIONAL LIBRARIES. Divisional and departmental collections are deposited in certain College buildings apart from the main Library. These collections are for the special convenience of the instructors and students of the departments concerned. They are under the direction of the librarian and are accessible to all students at regular hours.

Requirements for Admission

The entrance requirements to the College are made broad and flexible, only fundamental subjects being definitely required. These requirements are made upon the supposition that high schools are local institutions in which the courses should be adapted to the needs of the individual localities, and that college entrance requirements should be such as to take the output of the high schools, rather than to determine the nature of the work offered in them.

Any person who has completed a four-year course of study in any high school or academy accredited by the State Board of Education will be admitted to the freshman class.

In order to carry the several curricula successfully the following subjects must have been completed:

Curriculum in Agriculture	English, three units; physics, one unit; algebra, one unit; geometry, one unit.
Curriculum in Veterinary Medicine	Same as above.
Curriculum in Animal Husbandry and Veterinary Medicine	Same as above.
Curriculum in Home Economics	Same as above.
Curriculum in Industrial Journalism	Same as above.
Curricula in Music	Same as above.
Curriculum in General Science	English, three units; physics, one unit; algebra, one and one-half units, geometry, one unit.
Curricula in Agricultural Chemistry, Industrial Chemistry, and Biochemistry	Same as above.
Curriculum in Rural Commerce	Same as above.
Curricula in Engineering	English, three units; physics, one unit; algebra, one and one-half units, geometry, one and one-half units.
Curriculum in Architecture	Same as above.

These curricula were formulated on the assumption that the high-school subjects named will be offered for admission. Those graduates of accredited high schools who in accordance with a state law are admitted as freshmen without all of the high-school subjects that are prerequisite to carrying the curricula chosen will be assigned to the necessary subjects and allowed college credit toward graduation in them, as follows: Elementary Physics, four semester hours; Algebra III, two semester hours; Solid Geometry, two semester hours.

Persons who are not graduates of accredited high schools or academies will be admitted to the freshman class if they have completed fifteen acceptable units of high-school work. (A unit is defined to be the work in an accredited high school or academy in five recitation periods a week for one school year.) One who offers fourteen such units will be admitted as a freshman, but will be conditioned in one unit. Such deficiency must be made up the first year that the student is in attendance. If not made up within that time College credits are taken in its place.

Subjects acceptable for entrance, arranged in eight groups, together with the number of units that may be offered, are shown as follows:

GROUP I—ENGLISH	Three or four units
GROUP II FOREIGN LANGUAGES	Latin, one, two, three, or four units Greek, one, two, three, or four units German, one, two, three, or four units French, one, two, three, or four units Spanish, one, two, three, or four units
GROUP III MATHEMATICS	Elementary algebra, one or one and one-half units Plane geometry, one unit Solid geometry, one-half unit Plane trigonometry, one-half unit Advanced algebra, one-half unit

GROUP IV ..... NATURAL SCIENCES	Physical geography, one-half or one unit *Physics, one unit *Chemistry, one unit *Botany, one-half or one unit *Zoölogy, one-half or one unit *Physiology, one-half or one unit *General biology, one-half or one unit *General science, one-half or one unit
GROUP V ..... HISTORY AND SOCIAL SCIENCES	Greek and Roman history, one unit Medieval and modern history, one unit English history, one unit American history, one unit Economics, one-half or one unit Sociology, one-half unit Civics, one-half or one unit
GROUP VI ..... NORMAL TRAINING SUBJECTS	Psychology, one-half unit Methods and management, one-half unit Higher arithmetic, one-half unit Reviews Grammar, twelve weeks Geography, twelve weeks } one unit Reading, twelve weeks *Music, one unit
GROUP VII ..... INDUSTRIAL SUBJECTS	*Agriculture, one-half, one, two, three, or four units *Drawing, one-half or one unit *Woodwork, one-half, one, or two units *Forging, one-half or one unit *Domestic science, one-half, one, or two units *Domestic art, one-half, one, or two units
GROUP VIII ..... COMMERCIAL SUBJECTS	Commercial law, one-half unit Commercial geography, one-half unit Bookkeeping, one-half or one unit *Stenography and typewriting, one-half or one unit each

DEFICIENCIES

The courses in the Vocational School offered in connection with the College give every needed opportunity for students of the College to make up anything lacking in their preparation for entrance. All such entrance deficiencies must be made up before the beginning of the sophomore year. No student is considered a candidate for graduation in the spring who is deficient more than nine semester hours in addition to his regular assignment at the beginning of the first semester. No student who fails or is conditioned or found deficient in any subject, or whose grade in more than one subject falls below G in any semester, is allowed to carry extra work during the succeeding semester.

ADVANCED CREDIT

At the discretion of the president, students who present certificates showing credits for college work done in other institutions are allowed hour-for-hour credit on courses in this College in so far as they may be directly applied, or can be accepted as substitutions or electives. Candidates must present to the Committee on Advanced Standing their high-school and college credits certified to by the proper authorities. It is requested, also, that a college catalogue covering the period of attendance be furnished with the above credentials. In cases in which it is impossible for one to furnish an acceptable certificate concerning work upon which advanced credit is asked, examinations are given, if the subject has been studied under competent instruction.

If the work of the student shows that advanced credits have been wrongly allowed such credits will be revoked.

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* In courses consisting of laboratory work wholly or in part, two periods of laboratory work are to be considered the equivalent of one recitation period.

ADMISSION

ADMISSION BY EXAMINATION. Examinations for admission will be held at the College on Monday, September 11, 1922; Tuesday, January 30, 1923; and Friday, June 1, 1923. These examinations are given for the benefit of those students who need some additional high-school credits to qualify them for entrance to the freshman class. Applications for these examinations should be made in advance to the registrar.

ADMISSION BY CERTIFICATE. The applicant is required to submit to the Committee on Admission a certificate of the high-school or academy credit properly certified to by the authorities of the institution in which the work was done. Blanks will be furnished by the College for this purpose.

It is greatly to the advantage of the prospective student to see to it that this blank, properly filled out and *indicating the curriculum he wishes to take here,* be sent to the College as soon as possible after graduation. A permit to register will then be sent him by the registrar before the first of September. This permit *cannot be sent* unless the prospective student sees that the information as to curriculum is sent to the registrar. This will greatly facilitate the work of entrance. The student will present this permit at the registration room in Nichols Gymnasium, and will not be compelled to wait for his turn to meet the Committee on Admission.

LATE REGISTRATION

A considerable amount of extra work and a great deal of confusion is caused by the neglect of students to enroll at the time set for that purpose, and a fee of $1 will be charged those who enroll after the time fixed for the close of registration unless they present a good excuse for their delay.

SPECIAL STUDENTS

In recognition of the fact that experience and maturity tend to compensate, in a measure at least, for lack of scholastic attainment, the College admits as special students those who are twenty-one years of age or older, without requiring them to pass the regular examinations, provided (1) they show good reason for not taking a regular course; (2) they be assigned only to such work as they are qualified to carry successfully; (3) they do superior work in the subjects assigned. The age limit is not applied to special students of music.

A special student is assigned by the dean of the division in which occur the major subjects to be pursued.

KANSAS HIGH SCHOOLS AND ACADEMIES IN ACCREDITED RELATIONS WITH THE COLLEGE, YEAR 1920-1921

(Graduates admitted without examination.)

Abbyville
Abilene
Ada
Adams
Admire
Agenda
Agra
Alden
Alexander
Allen
Alma
Almena
Altamont
(Labette County)
Alta Vista
Alton
Altoona
Americus
Andover
Anthony
(Anthony High School)
(Spring Township H. S.)
Arcadia
Argonia
Arkansas City
Arlington
Arma
Asherville
Ashland
Assaria
Atchison
(Atchison High School)
(Mount Saint Scholastica Academy)
Athens
Athol
Atlanta
Attica
Atwood
(Rawlins County)
Auburn
Augusta
Aurora
Axtell
Baldwin
Bancroft
Barclay
Barnard
Barnes
Basehor
Bavaria

Baxter Springs
Bazine
Beattie
Belleville
Belle Plaine
Beloit
Belpre
Belvue
Bendena
Benedict
Bennington
Bentley
Benton
Bern
Berryton
Beverly
Bird City
Bison
Blue Mound
Blue Rapids
Bronson
Brookville
Brownell
Bucklin
Bucyrus
Buffalo
Buhler
Bunkerhill
Burden
Burdett
Burlingame
Burlington
Burns
Burr Oak
Burrton
Bushong
Bushton
Byers
Caldwell
Cambridge
Caney
Canton
Carbondale
Cassoday
Castleton
Cawker City
Cedar
Cedar Vale
Centralia
Chanute
Chapman
(Dickinson County)
Chase
Cheney
Cherokee
(Crawford County)
Cherryvale
Cimarron
Circleville
Claflin
Clay Center
(Clay County)
Clayton
Clearwater
Cleburne
Clifton
Climax
Clyde
Coats
Codell
Coffeyville
Colby
(Thomas County)
Coldwater
Colony
Columbus
(Cherokee County)
Concordia
(Concordia High School)
(Nazareth Academy)
Conway Springs
Copeland
Corning
Cottonwood Falls
(Chase County)
Council Grove
Courtland
Covert
Cuba
Cullison
Culver
Cunningham
Deerfield
Delavan
Delia
Delphos
Denison
Denton
Derby
De Soto
Dexter
Dighton
(Lane County)
Dodge City
(Dodge City High School)
(Saint Mary of the Plains Academy)
Dorrance
Douglass
Downs
Dunlap
Durham
Dwight
Easton
Edgeton
Edna
Edwardsville
Effingham
(Atchison County)
El Dorado
Elk City
Ellinwood
Ellis
Ellsworth
Elmdale
Elsmore
Elwood
Emporia
(Emporia High School)
(Normal High School)
Englewood
Enterprise
Erie
Esbon
Eskridge
Eudora
Eureka
Everest
Fairview
Fall River
Falun
Fellsburg
Florence
Ford
Formoso
Fort Scott
Fowler
Frankfort
Frontenac
Fredonia
Fulton
Galena
Galesburg
Galva
Garden City
Garden Plain
Gardner
Garfield
Garnett
Garrison
Gaylord
Geneseo
Girard
Glasco
Glen Elder
Goddard
Goff
Goodland
(Sherman County)
Gove
Grainfield
Great Bend
Greeley
Greenleaf
Greensburg
(Kiowa County)
Grenola
Gridley
Grinnell
Gypsum
Haddam
Halstead
Hamilton
Hamlin
Hanover
Hardtner
Harlan
Harper
(Harper High School)
(Harper Academy)
Hartford
Harveyville
Haven
Havensville
Haviland
(Haviland High School)
(Haviland Academy)
Hays
Hazelton
Herington
Herndon
Hesston
(Hesston Academy)
Hiawatha
Highland
Hill City
Hillsboro
(Hillsboro High School)
(Tabor College Academy)
Hoisington
Holcomb
Hollenberg
Holton
Holyrood
Hope
Horton
Howard
Hoxie
Hoyt
Hugoton
(Stevens County)
Humboldt
Hunter
Hutchinson
Independence
(Montgomery County)
Ingalls
Inman
Iola
Ionia
Irving
Isabel
Jamestown
Jarbalo
Jetmore
(Hodgeman County)
Jewell
Johnson
(Stanton County)
Junction City
(Junction City H. S.)
(Saint Xavier's Academy)
Kackley
Kanopolis

Kansas City
(Argentine High School)
(Catholic High School)
(Central High School)
(Sumner High School)
(Western University Academy)
(Wilson High School)
Keats
Kensington
Kincaid
Kingman
Kinsley
Kiowa
Kipp
Kirwin
La Crosse
La Cygne
La Harpe
Lakin
Lane
Langdon
Lansing
Larned
Latham
Lawrence
(Lawrence High School)
(Oread High School)
Leavenworth
(Catholic High School)
(Leavenworth H. S.)
(St. Mary's Academy)
Lebanon
Lebo
Lecompton
Lehigh
Lenora
Leon
Leona
Leonardville
Leoti
(Wichita County)
Le Roy
Lewis
Liberal
Lincoln
Lincolnville
Lindsborg
(Lindsborg High School)
(Bethany College Academy)
Linn
Linwood
Little River
Logan
Longford
Long Island
Longton
Lorraine
Lost Springs
Louisburg
Louisville
Lucas
Lyndon
Lyons
Macksville
Madison
Maize
Manhattan
(Manhattan High School)
(Sacred Heart Academy)
Mankato
Maplehill
Marion
Marquette
Marysville
Mayetta
McCracken
McCune
McDonald
McLouth
McPherson
(McPherson High School)
(Central College Academy)
(McPherson College Academy)
Meade
Medicine Lodge
Melvern
Meriden
Merriam
Michigan Valley
Milan
Mildred
Milton
Miltonvale
(Miltonvale High School)
(Wesleyan Academy)
Minneapolis
Minneola
Moline
Montezuma
Monument
Moran
Morehead
Morganville
Mound City
Mound Ridge
Mound Valley
Mount Hope
Mulberry
Mullinville
Mulvane
Munden
Muscotah
Narka
Natoma
Neal
Neodesha
Neosho Falls
Neosho Rapids
Ness City
Netawaka
Newton
(Newton High School)
(Bethel College Academy)
New Ulysses
(Grant County)
Nickerson
(Reno County)
Norcatur
Northbranch
(Northbranch Academy)
Norton
(Norton County)
Norway
Norwich
Oakland
Oakley
Oberlin
(Decatur County)
Offerle
Oketo
Olathe
Olsburg
Onaga
Oneida
Osage City
Osawatomie
Osborne
Oskaloosa
Oswego
Ottawa
(Ottawa High School)
(University Academy)
Overbrook
Overland Park
Oxford
Ozawkie
Padonia
Palco
Paola
(Paola High School)
(Ursuline Academy)
Parkerville
Parsons
Partridge
Pawnee Rock
Paxico
Peabody
Perry
Peru
Piedmont
Phillipsburg
Piper
Pittsburg
(Pittsburg High School)
(Normal High School)
Plainville
Plains
Pleasanton
Plevna
Pomona
Portis
Potter
Potwin
Pratt
Preston
Pretty Prairie
Princeton
Protection
Quenemo
Quinter
Ramona
Randall
Randolph
Ransom
Rantoul
Reading
Reece
Republic
Reserve
Richmond
Riley
Robinson
Rock Creek
Rolla
Rosalia
Rosedale
Rose Hill
Rossville
Roxbury
Rozel
Russell
Russell Springs
Sabetha
Saffordville
Saint George
Saint John
(Saint John High School)
(Antrim High School)
Saint Marys
(Saint Marys High School)
(Immaculate Conception High School)
Salina
(Salina High School)
(Sacred Heart Academy)
Savonburg
Sawyer
Scandia
Scott City
(Scott County)
Scranton

Sedan
Sedgwick
Seneca
  (Seneca High School)
  (Saint Peter and Paul's)
Severance
Severy
Sharon
Sharon Springs
Silver Lake
Simpson
Smith Center
Soldier
Solomon
South Haven
Sparks
Spearville
Spivey
Spring Hill
Stafford
Stanley
Stark
Sterling
Stilwell
Stockdale
Stockton
Sublette
Summerfield
Sylvan Grove
Sylvia
Syracuse
Tampa
Tescott
Thayer
Tonganoxie
Topeka
  (Topeka High School)
  (Catholic High School)
  (College of the Sisters of Bethany)
  Highland Park High School)
  (Seaman Rural High School)
  (Washburn Rural High School)
Toronto
Towanda
Tribune
  (Greeley County)
Trousdale
Troy
Turner
Turon
Udall
Uniontown
Utica
Valley Center
Valley Falls
Vermillion
Vernon
Vesper
Vinland
Viola
Virgil
Wa Keeney
  (Trego County)
Wakefield
Waldo
Walnut
Walton
Wamego
Washington
Waterville
Wathena
Waverly
Webster
Wekda
Wellington
  (Sumner County)
Wellsville
Westmoreland
Westphalia
Wetmore
Wheaton
White City
White Cloud
White Water
Whiting
Wichita
  (Wichita High School)
  (Cathedral High School)
  (Friends Univeristy Academy)
  (Mount Carmel Academy)
Williamsburg
Willis
Wilmore
Wilsey
Wilson
Winchester
Windom
Winfield
Winona
Woodbine
Woodston
Yates Center

Undergraduate Degrees and Certificates

For graduation, one must complete one of the four-year curricula as shown elsewhere. These are believed to provide for the necessities of most students who seek an institution of this kind, and departures from the specified work are not encouraged. Under special conditions, however, such College substitutions are allowed as the interests of the student demand. The total requirement, including military science or physical training, is about 134 hours, or semester credits, a semester credit being one hour of recitation or lecture work, or three hours of laboratory work a week, for one semester of eighteen weeks. A student, to be considered as a candidate for graduation, must have done his last year's work in residence. In special cases, candidates would be considered who have done three full years of work here and have done their last in an institution approved by the Faculty.

Candidates for graduation or for advanced degrees are requested to be present in person, unless arrangements have been made in advance for the conferring of the degree in absentia. Application for this privilege should be made to the student's dean.

DEGREES

The degree of Bachelor of Science (B. S.) is conferred upon those who have completed the four-year curriculum in agriculture, agricultural engineering, mechanical engineering, electrical engineering, civil engineering, flour-mill engineering, architecture, home economics, industrial journalism, agricultural chemistry, bio-chemistry, industrial chemistry, rural commerce or general science.

The degree of Bachelor of Music (B. M.) is conferred upon those who have completed one of the four-year curricula in music.

The degree of Doctor of Veterinary Medicine (D. V. M.) is conferred upon those who have completed the four-year curriculum in veterinary medicine.

CERTIFICATES

An appropriate certificate is granted upon completion of any one of the following:

1. The three-year curriculum in music.
2. The short course in agriculture.
3. The two-year curriculum in public-school music.
4. The one-year course in lunch-room management.
5. The housekeepers' course, lasting about fifteen weeks.
6. The eight-week creamery short course.
7. Any one of the special courses related to engineering.

Graduate Study

THE ADMINISTRATION OF GRADUATE COURSES

The administration of the graduate courses is vested in the Graduate Council. This body consists of seven members, selected from the different divisions of the College as follows: Agriculture, two; Engineering, one; General Science, two; Home Economics, one; and Veterinary Medicine, one. The members of the Graduate Council are appointed and its chairman designated by the President.

Graduate courses may be offered by members of the graduate faculty only. The graduate faculty consists of all those recommended by the department heads and approved by the Graduate Council as qualified to give graduate instruction. Its chairman is the chairman of the Graduate Council.

The Graduate Counhcil determines, subject to the authority of the President and the Board of Administration, and in accordance with any general regulations adopted by the graduate faculty, matters of curriculum, admission to graduate study and to candidacy to advanced degree, and other matters which relate to the proper administration and development of graduate work in the College.

ADMISSION

Admission to graduate courses is granted to graduates of institutions whose requirements for the bachelor's degree are substantially equivalent to those of the Kansas State Agricultural College. Admission to the graduate courses, however, may not be construed to imply admission to candidacy for an advanced degree. Such candidacy is determined by the Graduate Council upon the recommendation of the major instructor after the student has demonstrated by his work for a period of two months or longer that he has the ability to do major work of graduate grade. A mere accumulation of grades will not lead to a degree.

Three classes of applicants are recognized: (1) those who have received a bachelor's degree and wish to broaden their education without reference to an advanced degree; (2) those who wish to become candidates for advanced degrees, but are deficient in undergraduate preparation; and (3) those who wish to become candidates for an advanced degree and whose preparation is adequate.

Applicants of class 1 are admitted at once, on evidence of graduation, to approved graduate courses. Those of class 2 are admitted to graduate standing, but must at once make up their deficiencies by taking the necessary work in the undergraduate courses or by arrangement with the head of the department involved. Upon making up all deficiencies, class 2 applicants are recognized as of class 3. The latter are admitted to candidacy as previously provided.

Application blanks for admission to graduate courses may be secured from the registrar. Every applicant for admission must submit with his application an official transcript of his college record.

Students applying for graduate work should present themselves to the chairman of the Graduate Council, after registering at Nichols Gymnasium, for instructions concerning assignment to classes. On regular registration days (see College calendar), the chairman will be found at Nichols Gymnasium, on other days in room 38, Waters Hall.

REGISTRATION

Students who have been admitted to the graduate courses are required to register with the College registrar and with the chairman of the Graduate Council, at the beginning of each semester, unless special permission for later

registration has been granted by the chairman of the Graduate Council. Credit toward the fulfillment of the residence requirements dates from the time of registration and not from the beginning of the semester when the student enters.

CANDIDACY FOR MASTER'S DEGREE

Candidates for the degree of Master of Science (M.S.) are required to spend at least one collegiate year in residence, except under the special conditions noted below. The equivalent of thirty-two semester credits including a thesis must be satisfactorily completed. Not more than sixteen credits, including thesis, may be secured in a single semester. Students holding half-time graduate assistantships may not obtain more than eight credits, including thesis, in one semester.

GRADES. Graduate students' work is graded in five classes: E, G, M, P, and F. The last indicates a failure. P indicates unsatisfactory though passable work. The degree will not be conferred on any student who does not receive a grade of G or higher in three-fourths of the courses taken, including thesis. A failure or absence from examination in any course may prevent the conferring of the degree, and failure in any course in the major field precludes conferring the degree in the same year.

LANGUAGE REQUIREMENTS. A reading knowledge of a modern language in the field of the major subject is highly desirable. At the discretion of the department in which the major work is done, this may be required for the degree. This requirement must be met before the beginning of the last semester preceding the conferring of the degree by the student's presenting himself to the head of the Department of Modern Languages for examination. An earlier meeting of this requirement is highly desirable.

MASTER'S THESIS. Each candidate for a master's degree is required to present a thesis on some subject approved by the Graduate Council upon the recommendation of the instructor in charge of his major work.

The thesis ordinarily demands one-fourth of the student's time and may not exceed one-third of it. The thesis must be typewritten according to the specifications to be obtained from the office of the chairman of the Graduate Council.

Under proper conditions, a student of unusual attainment may be allowed to complete *in absentia* the last fourth of his work if this is devoted to his thesis. To secure this privilege, the student must have spent the equivalent of one semester and a half in residence and have creditably passed not less than twenty-four credits of graduate work; must petition for the privilege; must submit to the chairman of the Graduate Council an outline of his proposed investigation, approved by the head of his major department; and must submit satisfactory evidence that adequate facilities are available to him at the place where he proposes to do the work.

A preliminary report on the progress of all theses must be made by the major instructors to the chairman of the Graduate Council before April 1 of the year when the degree is conferred. Three complete copies of the theses as approved must be furnished not later than May 15 to the chairman of the Graduate Council. One of these copies will be deposited in the College Library, one with the dean of the division involved, and the other placed on file in the department in which the major subject is taken.

Six copies of a short but comprehensive abstract of each thesis giving a summary of the principal data and the conclusions, must be sent to the chairman of the Graduate Council before May 15 of the year the degree is conferred. These abstracts will be sent to the members of the candidate's examining committee.

A candidate for the master's degree is subject to a rigid oral examination covering his major and minor subjects and thesis by a committee consisting of the dean of the division in which his major subject was taken, the member of the Graduate Council from that division, and the instructors with whom he has taken major and minor work.

PROGRAM OF STUDY

In carrying graduate work, the student is expected to assume the initiative and the responsibility. It is important to recognize in the beginning that graduate work does not consist in the fulfillment of routine requirements alone. The various courses as well as the assistance and advice of the instructors are to be regarded simply as aids in acquiring the methods, discipline, and spirit of independent research.

Each candidate for a degree is expected to have a wide knowledge of his subject and of related lines of work. This is usually obtained only by a wide range of private reading and study outside the immediate field covered by the formal courses to which he may be assigned.

The branch of knowledge to which the student expects to devote the larger part of his time is termed his major subject. The other fields of study selected, which will necessarily be more restricted in scope, are termed minor subjects. The latter should be chosen with reference to their direct bearing on the major subject.

Approximately two-thirds of a student's time is devoted to his major subject and one-third to one or more minor subjects. The word subject is used to designate a recognized field of study, and is not defined by the limits of a department. The nature and distribution of the majors and minors are approved by the Graduate Council, upon the recommendation of the instructor with whom the major is taken.

The program of study suggested by the major instructor and approved by the Graduate Council is made the basis of the formal assignment to courses at the beginning of each semester and of the summer session.

It will be noted that in the announcements of the various departments of the College that certain courses are open to both graduate and undergraduate students. No credit earned during the undergraduate course may be counted for graduate credit, unless registered, at the time taken, with the chairman of the Graduate Council as credits in excess of those required for the bachelor's degree.

GRADUATE ASSISTANTSHIPS

In order to encourage graduates of this and similar institutions to continue their studies and to pursue advanced work leading to a master's degree, the College has established graduate assistantships in several departments. These assistantships demand half the time of the student for laboratory or research assistance along the line of his major work. The remainder of his time is given to graduate work. No graduate assistant may receive more than eight graduate credits per semester nor satisfy the residence requirement in less than two years.

Graduate assistantships paying a salary fixed each year by the Board of Administration have been established as follows:

Subject	*Number*	*Date vacant*
Animal Husbandry	1	September, 1922
Animal Husbandry	1	September, 1923
Bacteriology	1	September, 1923
Botany	1	September, 1922
Crops	1	September, 1922
Dairy Husbandry	1	September, 1922
Food Economics and Nutrition	1	September, 1922
Household Economics	1	September, 1923
Mechanical Engineering	1	September, 1922
Soils	1	September, 1922
Zoölogy	1	September, 1922

Appointments for all assistantships are made annually in March or soon thereafter for the following year. Students desiring such appointments may obtain application blanks from the chairman of the Graduate Council.

GRADUATE WORK IN THE SUMMER SESSION

Graduate students desiring to do a part or all of the work for the master's degree in the summer may complete the residence requirements in certain lines only, by pursuing graduate work for four summer sessions. Persons interested should correspond with the chairman of the Graduate Council in advance. In special cases it may be possible to complete the residence requirements for the master's degree as indicated above under "Candidacy for Master's Degree."

A detailed statement concerning the graduate work in the Summer School may be had on application to the dean of the Summer School, Kansas State Agricultural College, Manhattan, Kan.

Professional Degrees

ENGINEERING AND ARCHITECTURE

Graduates in engineering or in architecture from this College previous to 1917 who have been engaged in engineering or architectural practice for a period of five years or more, and graduates in 1917 or later who have been engaged in engineering or architectural practice for a period of three years or more, will be granted the professional degrees of M. E., C. E., E. E., Agr. E., F. M. E., or Architect, under the following conditions:

The graduate to be eligible to a degree must submit a statement of his experience and a thesis covering some phase of his practice. This thesis and experience must be approved by the head of the department in which the degree is requested, by the dean of the Division of Engineering, and by the Graduate Council, before the granting of such a degree will be recommended to the College Faculty and to the Board of Administration.

General Information

DUTIES AND PRIVILEGES

Good conduct in general, such as becomes men and women everywhere, is expected of all students. Every possible aid and stimulus toward the development of good character is given by the various Christian organizations of the College and the town and by the College itself. Every student is expected to render a good account of himself in the College community life. For those who are highminded and reasonable, no other requirements need be expected. College discipline is confined chiefly to sending away those whose conduct, after fair trial, makes their further attendance at the College unprofitable or inadvisable.

In order that a fine type of democratic sociability may be fostered among students and Faculty, a large community recreation and rest center has been recently established (1920) in Anderson hall, the administrative building. This center, one of the largest rooms on the campus, is furnished with divans, arm chairs, and writing tables in wicker and is neatly and beautifully decorated. During vacant hours and between classes, students and Faculty gather here for rest and conversation. The room is also available for student and Faculty receptions and parties during the late afternoon and the evening hours.

Absences from class or laboratory periods must be accounted for to the instructor concerned. Permission for absence from College for one or more days must be secured in advance from the dean of the division in which the student is registered. Students cannot honorably leave the College before the close of a semester except by previous arrangement with the deans concerned.

Opportunities for general scientific, literary and forensic training are afforded, in addition to the College courses, by various literary and scientific societies and clubs. The Science Club, meeting monthly, admits to membership all instructors and students interested in science. Papers given at the meetings of the Science Club represent original work in science done at the institution. The program is further characterized by free discussion of the papers presented and by general scientific notes and news contributed by the members. The numerous literary and professional societies, which are described elsewhere in the catalogue under the title "Student Organizations," also afford excellent training in their diverse lines.

At various times during the year the College halls are opened for social, literary, musical, and dramatic entertainments furnished by lecture courses, by the literary societies, by the Department of Music, by the Dramatic Club, by the Oratorical Association, and by other organizations of students and instructors. Addresses by prominent speakers, men of affairs, and persons prominent in scientific, educational, and social work are of frequent occurrence.

EXPENSES

TUITION. There is no charge for tuition. Class instruction in music is free, but fees are charged for individual instruction. (See Department of Music for statement of fees for music.)

MATRICULATION FEE. A matriculation or entrance fee of $10 for residents of Kansas, or $15 for nonresidents, is charged all students in College curricula and in the Vocational School. This fee is not charged Summer School students or short course students, but it is payable by special students in the College or the Vocational School.

INCIDENTAL FEE. An incidental fee of $20 a year or $10 a summer term is charged residents of Kansas; nonresidents pay $30 a year or $15 a summer term. Students in short courses of more than eight weeks duration pay an

incidental fee of $10. Eight-week short-course students pay an incidental fee of $5.

SICK-BENEFIT FEE. Each student in the College or Vocational School pays a sick-benefit fee of $3 a year or $1.50 for a summer term. Students in short courses of more than eight weeks duration pay a sick-benefit fee of $1.50. For students in the short courses, lasting eight weeks only, this fee is $1.

The sick-benefit fee entitles the student to receive the service of the College physician for any illness contracted while in College. The fee does not include the cost of medicine, surgical operations, reduction of fractures, hospital fees, or the treatment of chronic conditions. As far as possible, and provided the students requesting such services live within the city limits, the College physician visits in their rooms students who are too ill to go to the physician's office.

As in the case of all other fees, the College reserves the right to change this fee or to modify the benefits given for it, without previous notice.

The College maintains on the campus a contagion hospital having separate wards for men and women. This hospital is in charge of a matron who resides continuously in the building and cares for the patients under the direction of the College physician. Students, when suffering from or suspected of having any contagious disease, except smallpox, are admitted to the hospital on the recommendation of the College physician. The student's only expense for hospital service is a fixed charge of $1.50 a day. The aim of the College in providing this hospital is to prevent contagious diseases among the students and, in case the student should contract such a disease, to make it unnecessary to quarantine a rooming house where there are many students.

LATE REGISTRATION FEE. For unexcused late registration the student is charged $1.

LABORATORY EXPENSE. In all laboratories students are required to pay for supplies used and for apparatus broken or lost. The cost in the several subjects ranges from 50 cents to $7.50 a semester. In the special courses related to engineering, the laboratory charges are fixed at from $18 to $36 for the entire course.

COMMENCEMENT FEE. On graduation students pay a commencement fee of $10 to cover the cost of the diploma and other commencement expenses.

WHEN FEES ARE PAYABLE. All fees of $30 or less are payable at the beginning of each year, but in case of withdrawal not later than the beginning of the second semester a refund is payable to the student. All fees over $30 are payable in two equal installments at the beginning of each semester.

REFUND OF FEES. A student leaving at or before the first one-fourth of a term or semester may receive a refund of one-half the incidental fee. A student remaining more than one-fourth and less than one-half a term or semester may receive a refund of one-fourth of the incidental and health fees. No refund on fees of a current term or semester will be made to a student remaining as much as one-half of that term or semester.

STUDENT ACTIVITY FEE. Each student pays a student activity fee of $5 a semester. This fee is imposed by vote of the students themselves, and at their request is collected by the College at the beginning of each semester along with the fees levied by the state. Payment of this fee admits the student to all athletic events, to all intercollegiate debates and oratorical contests, and to band concerts, and gives membership in the Students' Self-governing Association. Exemption from payment of this fee is allowed by the president of the College in special cases where in his judgment the student would find the payment of the fee a hardship. The members of the Faculty and the employees of the College are allowed the privilege of participation in the activity-fee plan.

TEXTBOOKS. The average cost of textbooks is about $8 a semester in most of the curricula. For the first semester the cost is about $12. There is considerable variation from term to term and in the different curricula.

GYMNASIUM SUITS. Each young woman taking physical training must have an approved gymnasium suit costing about $4.50. Complete gymnasium suits for young men cost about $5.

MILITARY UNIFORM. Each student required to take military training pays a fee of 25 cents a semester for use of his uniform, which is furnished by the government.

ROOMS. Rooms are not furnished by the College. They are readily obtainable in the city at a cost of from $10 to $15 a month for a room suitable for two occupants. Less desirable quarters and less desirable locations may be obtained at a lower rate. There are great differences in the accommodations offered. Those for which the higher prices are charged are modern in all respects, and light, heat, and bath are included in the cost stated.

BOARD. The cost of board depends largely upon individual requirements. In clubs and private boarding houses the cost is usually from $5 to $7 a week. Students may board themselves at a smaller money outlay. The College operates a first-class cafeteria, where all meals may be obtained, except on Sundays, at moderate prices. Food is furnished at cost and the expense to the student depends upon the care and judgment which he employs. The College also operates a mess-hall where meals are served every day in the week at thirty cents each. This is especially convenient for men in the special courses related to engineering.

LAUNDRY. The expense for laundry may be estimated at 40 cents to 70 cents a week, depending upon individual requirements.

BOARDING AND ROOMING HOUSES

The Christian Associations of the Agricultural College keep on file the official list of boarding and rooming houses. All correspondence relative to boarding accommodations, in advance of the student's arrival in Manhattan, may be addressed to the secretary of the Young Men's Christian Association, to the secretary of the Young Women's Christian Association, or to the registrar of the College. Upon arrival in Manhattan, young men should go directly to the Y. M. C. A. building, corner of Eleventh and Fremont streets, or to the office of the Y. M. C. A. secretary, in Anderson Hall on the College campus. Young women upon arrival should go directly to the Y. W. C. A. offices in Home Economics Hall on the campus. The cars from the Union Pacific station pass directly by the Y. M. C. A. building. Jitney service may be had from either station.

For three days before the opening of the fall semester and for the first three days after the opening day, committees from these associations meet trains and assist in directing new students, either to the association buildings or directly to proper boarding places. The associations make no charge for their services or for lists of all approved boarding places, and new students should depend absolutely upon the recommendations of the association committees.

SELF-SUPPORT

The courses of instruction are based upon the supposition that the student is here for study, and therefore a proper grasp of the subjects cannot be obtained by the average student unless the greater part of his time is given to College work. Students of limited means are encouraged and aided in every possible way, but unless exceptionally strong, both mentally and physically, such students are advised to take lighter work by extending their courses, in case they are obliged to give any considerable time to self-support. As a rule, a student should be prepared with means for at least a semester, as some time is required in which to make acquaintances and to learn where suitable work may be obtained.

There are various lines in which students may find employment. The College itself employs labor to the extent of about $1,200 a month, at rates varying from 20 to 35 cents an hour, according to the nature of the employ-

ment and the experience of the employee. Most of this labor is upon the College farm, in the orchards and gardens, in the shops and the printing office, for the janitor, etc. Various departments utilize student help to a considerable extent during the vacations. Students demonstrating exceptional efficiency, ability, and trustworthiness obtain limited employment in special duties about the College. Many students secure employment in various lines in the town, and some opportunity exists for obtaining board in exchange for work, with families either in town or in the neighboring country.

Labor is universally respected in the College community, and the student who remains under the necessity of earning his way will find himself absolutely unhampered by discouraging social conditions. Indeed, over one-third of the students support themselves wholly, while a third support themselves in part. False standards regarding physical work do not exist, and are not tolerated by the board of instruction or by the student body as a whole. Absolutely democratic standards prevail at the College, and students are judged on the basis of their personal worth and efficiency alone.

Students are assisted to obtain employment by means of the employment bureaus maintained by the Young Men's Christian Association and by the Young Women's Christian Association of the College, with secretaries of which organizations correspondence is encouraged.

STUDENT LOAN FUNDS

THE ALUMNI LOAN FUND. The Alumni Association of the Kansas State Agricultural College has created a loan fund, chiefly by means of payments by which the alumnus is relieved from further regular dues in the association. Members are due to pay the association $5 a year, and on payment of $100 in one sum they are relieved from such dues. The fund so created, amounting now to about $2,000, is lent to students at 5 per cent per annum. The fund is administered by a committee appointed by the directors of the Alumni Association. The committee announces no specific rules governing the granting of loans, but in general gives preference to smaller amounts on short time over larger amounts which cannot be paid for several years. Alumni are urged to add to the funds thus made available to worthy students. Students wishing loans from this fund may address Dean J. T. Willard, chairman of the Alumni Loan Fund Committee, Manhattan, Kan.

THE HENRY JACKSON WATERS LOAN FUND. The Henry Jackson Waters loan fund consists of the royalties received from the Kansas sales of Ex-President Waters' textbook, *The Essentials of Agriculture*. The royalties so far have amounted to more than $1,000, which sum has been augmented by gifts of $100 each from Senator Capper and L. R. Eakin, of Manhattan, and by smaller amounts received from some others. The entire amount has been loaned nearly all the time. The fund is administered by a committee appointed by the president of the College and approved by the Board of Administration. The rules for the loans are likewise approved by the Board. The rules allow emergency loans of $50 to any student who has completed one semester of work in this College. Juniors may borrow $100 and seniors may borrow $150. Applications for loans should be made to Prof. Albert Dickens, chairman of the Waters Loan Fund Committee, Manhattan, Kan.

THE CHAMBER OF COMMERCE LOAN FUND. The members of the Chamber of Commerce of Manhattan have raised a fund which now amounts to $3,000 and is being augmented constantly. This is loaned to deserving students at 5 per cent per annum. About ninety loans have been made. Applications for loans from this fund should be addressed to the secretary, Chamber of Commerce, Manhattan, Kan.

THE STATE FEDERATION OF WOMEN'S CLUBS LOAN FUND. Each year several of the young women students of the Kansas State Agricultural College are

beneficiaries of the State Federation of Women's Clubs through the administration of its liberal young women's student loan fund. Information regarding this fund can be obtained by addressing Dean Mary P. Van Zile, Manhattan, Kan.

THE P. E. O. LOAN FUND. The P. E. O., a national organization of women, maintains an educational fund to be loaned to girls to help defray college expenses. Information regarding this fund may be obtained from Dean Mary P. Van Zile.

THE SOCIAL CLUB LOAN FUND. This is a fund loaned by the K. S. A. C. Social Club and is administered by the Waters Loan Fund Committee.

THE D. A. R. LOAN FUND. The D. A. R. loan fund is a fund available to both men and women students and is administered by the Waters Loan Fund Committee.

THE WOMEN'S PAN-HELLENIC LOAN FUND. The Alumnæ Pan-Hellenic Fund is loaned to women students. Applications should be made to the president, City Pan-Hellenic, through Dean Mary P. Van Zile.

PRIZES AND MEDALS

STOCK JUDGING. The Block and Bridle Club offers four medals, one gold, one silver, and two bronze, to students obtaining the highest four places in the club's stock-judging contest. The same organization offers prizes of books for stock judging. The faculty of the Department of Animal Husbandry offers prizes of books or papers on stock judging.

DAIRY JUDGING. The Student Dairy Association each year holds a dairy-judging contest, and offers a gold, a silver, and a bronze medal to students obtaining the highest three places.

GRAIN JUDGING. The Klod and Kernel Klub holds an annual grain-judging contest. Cash prizes, subscriptions to farm papers, and ribbons are given to the highest ranking students.

PLAY WRITING. The Purple Masque Dramatic Fraternity offers each year a prize of $50 for the best original play written by a student of the Kansas State Agricultural College and suitable for presentation by the fraternity.

ORATORY. The literary societies, through the Oratorical Board, offer each year, in the Intersociety Oratorical Contest, the following prizes:

First prize, gold medal and $25.
Second prize, silver medal and $15.
Third prize, bronze medal and $10.

The Oratorical Board also finances the sending of a representative from the College to the annual Peace Oratorical Contests, to the winners of which valuable prizes in money are awarded.

The Department of Public Speaking sends to the annual Missouri Valley Contest an orator as the representative of the College. In this contest valuable prizes in money and medals are awarded.

SHORT-STORY WRITING. The Quill Club offers annually a gold medal to the student of Kansas State Agricultural College writing the best short story in a contest held by this organization.

SOCIOLOGY. The Kappa Alpha chapter of the Chi Omega Sorority offers a prize of $25 to the student who holds the highest grade in sociology at the end of the second semester each year, the standing of the student to be determined by the instructor.

SCHOLARSHIPS

MILLING INDUSTRY. The Kansas Flour Mills Company offers $300 annually to advanced students specializing in milling industry. This sum has been divided into three scholarships which are open to students in the Divisions

of Agriculture, General Science, and Engineering who are specializing in flour milling and other milling-industry work. They are awarded on or before June 1 of each year, and except in unusual cases are not awarded to students below junior standing. Other things being equal, preference is given to residents of the state of Kansas.

In awarding these scholarships, the following points regarding the student are considered: Course of study pursued, scholarship, character and personality, and financial condition. The stipend is divided into ten monthly payments, the first payment being made September 1 and the last, June 1.

DEBATE. In the Department of English two scholarships of the value of $100 each, one for men and one for women students, are offered annually for proficiency in intercollegiate debating.

GRADUATE ASSISTANTSHIPS

Graduate assistantships have been established for some years by action of the Board of Administration, and are available in several departments of the College. For full details see a previous paragraph in the section devoted to graduate study.

BUSINESS DIRECTIONS

General information concerning the College may be obtained from the president or the registrar. Financial matters are handled through the office of the business manager, State Board of Administration, Topeka, Kan.

Scientific and practical questions, and requests for special advice in subjects in which the College and the Experiment Stations are prepared to give information, should be addressed to the heads of the departments concerned with the work regarding which information is sought.

Applications for farmers' institutes should be made as early in the season as possible, to the Division of College Extension. Applications for the publications of the Agricultural Experiment Station should be addressed: Director of the Agricultural Experiment Station, Manhattan, Kan. Publications of the Engineering Experiment Station may be had by addressing: Director of the Engineering Experiment Station, Manhattan, Kan.

Donations to the Library should be addressed to the librarian, and donations to the Museum to the curator of the Museum.

STUDENT ASSEMBLY

The Student Assembly is held one hour each week. At this time the library, offices, classrooms, and laboratories are closed and the students gather in the College Auditorium. These assembly exercises consist of devotional services, music, and addresses. The devotional exercises are conducted by members of the Faculty, by resident ministers of the various denominations, or by prominent visitors. Excellent music is provided by the College Orchestra, by members of the Department of Music, and by available outside talent. In addition to the addresses delivered by the president and by members of the Faculty, many prominent leaders of state and national reputation are invited to address the assembly. Thus the Student Assembly has become a center of true culture and enlightenment. Although attendance is not compulsory, it is common to see nearly two thousand enthusiastic students present during these exercises.

COLLEGE PUBLICATIONS

The official organ of the College is *The Kansas Industrialist,* published and printed at the College weekly by the Department of Industrial Journalism and Printing. Its pages are filled with articles of interest, with special reference to agriculture and the industries. Particular attention is paid to information concerning the work of the College, to investigations of the Experiment Stations, and to local and alumni news. *The Kansas Industrialist* will be sent to

any address for seventy-five cents a year. The alumni may have *The Kansas Industrialist* free upon application.

The Division of College Extension issues a monthly publication entitled *Agricultural Education,* of special interest to institute members.

The students of the College publish a semiweekly periodical, *The Kansas State Collegian,* in the interest of the students at large. This paper is edited and managed by a staff elected by students. A College annual, *Royal Purple,* is published each year by the senior class.

ASSIGNMENTS

No student may be enrolled in classes before receiving an assignment, and no assignment is completed until after the incidental fee is paid.

Assignments at the dates shown in the College calendar are made in Nichols Gymnasium, where detailed directions are announced by placards. Later assignments are made by the student's assigner during regular office hours, but are subject to checking by the registrar in respect to availability of classes. Classes are closed when the limits as to numbers are reached. A student is not admitted later than ten days after the opening of the semester except by special permission of his dean. An extra fee of one dollar is charged for assignments secured after the regular dates for assignment of students at the opening of each semester as announced in the College calendar, unless an acceptable reason for the tardiness is given.

A student desiring to take work at any other than the regular time must obtain the written consent of his dean, the head of the department in which the work is to be done, and the dean of the division to which the department belongs.

Each student must take full work unless excused by his dean, and more than regular work is not allowed to any student except by permission of his dean, and under no circumstances to any one who failed or was conditioned or deficient in any subject the preceding semester, or whose grade was below G in more than one subject.

A student who, at the end of the semester, receives grades below passing in fifty per cent or more of the work to which he is assigned is required to leave College for at least one semester unless there are sufficiently extenuating circumstances, in which case his dean may suspend the rule and allow an assignment to twelve semester hours of work. Every student must carry the maximum load of which he is capable.

Any student who, at the end of the term, receives grades below passing in twenty-five per cent of his assigned work is allowed not more than seventy-five per cent of the regular work next semester.

Special requests concerning assignments, and permission to make up deficiencies by outside study under an approved tutor, are acted upon by the student's dean in conference with the heads of the departments involved.

CHANGES IN ASSIGNMENTS

No student may drop a study or modify his assignment except by a reassignment, and any student desiring a change in his assignment must apply to his dean. Any change in a student's assignment is made in the office of his dean. Teachers desiring that assignments be changed send requests to the proper deans. Notices of changes are furnished the registrar, the student and the student's assigner. Changes are effective at once and the registrar, through the heads of departments, sends notices or enrollment cards to the teachers affected.

A student receiving a notice of reassignment must at once report to classes in accordance therewith. If not content with the revised assignment, he may confer with his dean concerning it. All absences caused by a student's dropping out of class without a proper reassignment are reported by the instructor as unexcused absences.

ABSENCE AND TARDINESS

Each student must appear at the first exercises of his classes after he is assigned. Students must be present the very first day of each semester or render a reasonable excuse. All absences are reported from the first day of the semester, even though the student enrolled late. Failure to take out an assignment is not accepted as an excuse for absence from classes. A student is not admitted later than ten days after the opening of the semester except by special permission of his dean.

Each student is required to attend every exercise of a class to which he is assigned. All absences and all cases of tardiness must be promptly accounted for on the "absence blanks." Permission for necessary absences from College, for a day or more must, in all cases, be previously obtained from the dean. Any student present at College and desiring to be excused for the day from certain classes must apply in advance to the teachers of those subjects. Any student having been absent ten hours without excuse is thereby automatically suspended from College, and is reported to the president for notification of such suspension. For reinstatement he must apply to his dean or the president.

The class record of attendance is marked immediately after the beginning of the class period. For students who come in late the record of absence may be changed to that of tardiness, but the teacher is not obliged to make such change unless the student on the day of tardiness hands to him at the close of the hour, on the "absence blank," a statement that he was present. In such a case the record is changed to agree with the facts. When a student who has been absent from College because of sickness returns, he must present to each instructor a certificate of good health from the College physician before he is permitted to remain in any classroom. The aim is to prevent the spread of any contagious disease.

Any class is excused if for any reason the instructor fails to report at the end of ten minutes after the beginning of the recitation period, unless the instructor sends word that he will be there later.

Signed reports of absences for each day are sent to the deans by the teachers before five o'clock p. m. Excuses submitted by students are transmitted with a recommendation in respect to excusing the absence. Action concerning excuse for absence is taken by the student's dean. Excuse for an absence does not relieve the student from responsibility for lecture, recitation or laboratory work lost while absent.

Any student who is found to be persistently inattentive in his College work is at once temporarily suspended by his dean, and reported to the president for permanent suspension.

EXAMINATIONS

Examinations are held during the last eight days of the semester in accordance with a definite examination schedule which, as far as possible, gives the student not more than two examinations on any one day.

Any student who receives a grade of E for the semester, in any subject, and whose absences for all causes from the class in such subject do not exceed one-tenth of the number of times the class is scheduled to meet during the semester, may be excused from the final examination in that subject, at the discretion of the instructor; provided, however, that instructors are to announce such exemption lists in their respective subjects not earlier than the last session of the class preceding the final examination.

Examinations to remove conditions are held on the fourth Saturday of each semester. A student who has received the grade C is entitled to take such special examination, provided the instructor or the department head be notified of the student's desire to take the examination not later than the Tuesday evening preceding the Saturday set for the examinations. If a subject in which a student is conditioned is not passed at the first opportunity, the grade is changed from C to F.

Permission for examination in subjects not taken in class must be obtained

on recommendation of the professor in charge, from the dean of the division in which the student is assigned. Permission to take such examination is not granted unless the preparation for it is made under an approved tutor. All such examinations are under the immediate supervision of the professor in whose department the subject falls.

Examinations in high-school subjects for admission to the College are held at the beginning of each semester and of the summer school. Students desiring such examinations should consult the registrar in advance.

GRADES

Student grades are designated by the letters E, G, M, P, C, F, and U, having the following significance and order of rank:

The grade E designates really distinguished achievement, and is the net resultant of exceptionally good mental ability in conjunction with serious application. It is expected that this grade will not include more than ten per cent of all grades given a class, and usually will include about five per cent.

The grade G represents superior achievement, better than that exhibited by the average student, but not distinguished. It is recognized as a mark of considerable honor and is the resultant of high ability and fair application, or of fair ability and serious application. The percentage of students assigned this grade will depend somewhat upon the number assigned grade E, but the sum of grades E and G should approximate twenty-five per cent of all grades assigned.

The grade M represents the standing of about half of all students in the College. It means achievement equal to that of the average of students, and includes about half of all student grades. It indicates neither superior nor inferior accomplishment.

The grade P, meaning passed, represents achievement of a grade below that of the average of students. It indicates a student's position as being in the upper part of the lower fourth of the class and his work as being such as may be described as poor, or inferior. The number of grades P awarded, together with the grades C and F, should not, on the whole, exceed twenty-five per cent of all, and are expected to include about that proportion.

The grade C, meaning conditioned, is the symbol used to represent two types of inferior work: (*a*) that which is deficient in quality, and (*b*) that which is satisfactory as to quality but inadequate as to quantity. The results of examinations to remove conditions are reported simply as P (passed) or F (failed), and such examinations not taken are recorded as F.

The grade F, meaning failed, is used to indicate work that is so unsatisfactory as to require that the work be repeated in class or under an approved tutor.

The letter U, meaning unfinished, is reported when, in the judgment of the instructor, the student deserves further time to complete work which has been interfered with by illness or other excusable cause of absence or disability. This is only a temporary report and in no way prejudices the student's final grade in a course.

REPORTS OF GRADES

On the fifth Saturday and the ninth Saturday of each semester, and within two days after the close of each semester, reports of all grades below passing at those dates are sent to the students and the deans. The dates are shown in the College calendar, and these reports are an imperative duty of all teachers. The first two of these reports are made in percentages on a scale of seventy for passing. The reports at the end of the semester are on the letter system in use.

The instructor prepares for each student a semester grade based on the examination and class work, and is required to report this to the registrar for record within two weeks after the close of the semester. If a student goes through the first half of the semester but not the second half, a half-semester grade is reported for record, and designated as such. If the student drops a subject before midsemester a grade of Wd, withdrawn, or F, failure, is

reported. A subject dropped at any time on account of failure is given a semester grade of F.

In cases of absence from the final examination at the end of a semester, a semester grade is not reported until the reason for such absence has been learned; and if the absence is excused or excusable, a reasonable time, usually not over one month, is allowed within which the examination may be taken. In such cases, however, within two weeks after the end of the semester the teacher reports to the registrar a mark of U with a grade for the first half of the semester. If the student's absence is inexcusable a semester grade is reported on the basis of zero for the final examination.

Students in laboratory and industrial work must put in at least four-fifths of the required time in order to get a passing grade in the subject. Should the required time minimum not be reached a mark of U is reported if the quality of the work done is satisfactory and one of F if it is unsatisfactory.

Instructors are enjoined to leave all class books on file in the proper department or with the president of the College when severing their connection with the institution.

CREDITS FOR EXTRA WORK

Activities connected with the College, but not provided for by any of the curricula, either as required subjects or as electives, are designated as *extra subjects.*

Credit for extra work may be given when the student is regularly assigned to the work in accordance with the general rules governing assignments. A student may be assigned to extra work for credit upon the written recommendation of the instructor in charge of the work. This recommendation is filed in the office of the student's dean, and is effective until revoked.

Credits earned for extra work may be counted as part or all of the electives in any of the College curricula. In curricula that do not include electives, credits for extra work are available only as substitutions for required work, and must be approved in the regular way before becoming effective. A total of not more than eight semester credits may be allowed a student for extra work, and not more than two of these may be obtained in any one semester.

The number of semester credits that may be allowed for extra work is as follows:

Subject	*Per semester*	*Total*
Physical Training	1	4
Orchestra	1	4
Band	1	4
Choral Society	1	4
Debate	2	4
Oratorical Contest	2	4
Kansas State Collegian journalism	1	4

BIBLE STUDY

Bible study is an elective. Two semester credits are granted for each completed one-year course. Credit may be granted to any one student for not more than two courses. Teachers of classes are to be approved as tutors, and the supervision of the work is placed in the Department of Education. This department also conducts the examination for credit in Bible study.

COURSE NUMBERS

Each course offered bears a number indicating in a general way the standing of students for whom it is given. Courses for undergraduates bear numbers 101 to 199, courses for undergraduates and graduates bear numbers 201 to 299, and courses for graduates only bear numbers 301 to 399. The numbers 1 to 29 are applied to studies offered for short-course students, the numbers 31 to 49 are assigned to Summer School subjects not taught for entrance credit or for College credit, and subjects which give credit in the School of Agriculture are numbered 51 to 99.

In applying this system, the courses offered by any department are numbered independently of all other departments of the College.

CLASSES

The minimum numbers for which classes are organized are as follows:

The Vocational School	18
Freshmen or sophomores	12
Juniors or seniors	7

This rule is varied only by special permission of the Board of Administration.

THE STUDENTS' SELF-GOVERNING ASSOCIATION

The Students' Self-governing Association was organized on broad lines in the spring of 1919, with the whole-hearted approval and sanction of the Faculty. The association was formed "for the purpose of placing the control and advancement of student interests and activities in the hands of the student body itself, with the firm belief that this arrangement will cause an increased self-control, resulting in higher ideals and better coöperation, and that officers of sufficient wisdom and maturity may be found so that appeal to College authorities shall be unnecessary."

All students enrolled under any department of the College are eligible for membership. The annual membership fee is 50 cents. Special dues to include admission to student activities may be voted by the association.

The officers of the association are a president and a vice president, elected by the association as a whole, and a secretary and a treasurer, elected by the executive council of the association.

The supreme governing council of the student association is known as the executive council. This body consists of nineteen members, and its membership is made up as follows: The president and the vice president of the association; two members from each of the College classes; two from the Literary Society Council; one from the Women's Pan-Hellenic Council; one from the Men's Pan-Hellenic Council; one from the "K" fraternity; one from the Women's Athletic Association; one from the Y. W. C. A. cabinet; one from the Y. M. C. A. cabinet; and one from the School of Agriculture. Regular meetings of the council are held once a month.

There are standing committees on discipline, finance, social affairs, calendar, school spirit, and points, and other temporary or standing committees may be provided for from time to time as occasion demands. All chairmen of committees are appointed by the executive council. Each chairman submits a list of members desired for his committee, which appointments must be ratified by the executive committee before they become effective.

All regulations passed by the executive council, by committees, and by the entire association, are considered valid and binding upon all students in so far as said actions are not disapproved by the Faculty and the president of the College.

The Students' Self-governing Association is the successor of the Student Council, a representative body which was organized in 1909, received official sanction from the Faculty of the College and from the Board of Administration, and functioned successfully until replaced by the Students' Self-governing Association and its executive council. The Student Council consisted of four members elected from the senior class, three from the junior, two from the sophomore, and one from the freshman class. In addition, the School of Agriculture elected a delegate, who, however, had no vote. At each meeting of the council a member of the Faculty was privileged to be present and to participate in the discussions.

THE CHRISTIAN ASSOCIATIONS

The Young Men's Christian Association and the Young Women's Christian Association are organizations of the greatest worth and value in the College community, forming centers of moral culture and religious stimulus among the young men and women during their developmental period. As is well known,

the Christian associations in colleges stand for the best ideals among the students, and are always accorded the cordial support of the authorities. In addition to general moral and spiritual development, the College Christian associations are of practical and efficient influence among the students in many directions.

THE YOUNG MEN'S CHRISTIAN ASSOCIATION

The College Y. M. C. A. has always been a strong and influential body among the students. Its growth may be indicated by the fact that the organization was able in 1908 to erect a handsome building for its purposes at a cost of $35,000, on the corner of Eleventh and Fremont streets, near the College grounds.

This building contains reading rooms, committee rooms, students' living rooms, gymnasium, etc. All young men are welcome to make use of the privileges of the building, whether members or not. No fixed fees for membership are charged, each member giving whatever he feels able to afford. One of the useful and practical features of the Y. M. C. A. is a students' employment bureau, which is maintained for the benefit of all students seeking employment. The religious work of the organization includes various courses for the study of the Bible and the work of Christian missions, which are maintained through the winter. The regular religious meetings of the association occur on Thursday evenings from 6:45 to 7:30, while occasional Sunday afternoon meetings are also held. Special meetings and receptions, which serve to broaden the acquaintanceship of the students and promote good-fellowship, are arranged from time to time. Especial attention is given the new students on and after their arrival, and assistance is rendered in securing rooms and boarding places for them. The association maintains a regular secretary, with whom prospective students are cordially encouraged to correspond. Address General Secretary, Y. M. C. A., Kansas State Agricultural College, Manhattan, Kan.

THE YOUNG WOMEN'S CHRISTIAN ASSOCIATION.

Similar in aim and purpose to the organization of the young men is the Young Women's Christian Association. The Home Economics Hall is the headquarters of the association, to which all young women of the College are at all times cordially welcome. An office for the general secretary and rest rooms for the young women are maintained in this building during the College year.

An employment bureau for women students is maintained by the general secretary, without charge to its beneficiaries. Various committees are responsible for the lines of work of the association. At the opening of the College semesters the incoming trains are met by "Big Sisters," who assist new women students, the "Little Sisters," in securing suitable lodging and boarding places. If any prospective woman student will write to the general secretary of the association, her "Big Sister" will correspond with her during the summer vacation.

During the College year various social functions are held for the young women. The first of these is an informal reception to enable the College girls to become acquainted with one another. Once each year the two associations entertain jointly.

The religious life of the young women is fostered by the weekly vesper services held in Recreation Center. The different churches of the city extend a cordial welcome to the College women, and through the efforts of the association they are encouraged to active participation in the services of the church of their choice.

THE NEWMAN CLUB

The Newman Club, an organization of Catholic students, holds meetings devoted to religious study on alternate Sundays. This work is carried on under the local pastor. The College authorities recognize this Bible study by allowing a two-hour credit for it when duly certified. In further recognition

of the club's efforts the College has placed a set of the Catholic Encyclopedia in the library. where there is also a comprehensive selection of Catholic books and pamphlets purchased by the club. In addition to the meetings devoted to religious study, social meetings are held.

The club is affiliated with the national organization of Newman clubs of the state universities and colleges. Its aim is to foster sound morality, to develop character, and to promote the knowledge and practice of their faith among Catholic students.

THE HENRY SCATTERGOOD FRIENDLY GROUP

The Henry Scattergood Friendly Group, an organization of the Society of Friends young people, holds its regular meeting Sunday afternoons during the College year, and considers the problems confronting the student in his religious and civil life. It aims to find in Christian association a broader spiritual service in College life.

To prospective students, the group offers a cordial welcome.

LITERARY AND SCIENTIFIC SOCIETIES

The literary societies of the College, eight in number, are wholly student organizations, holding weekly meetings in the College buildings. The Alpha Beta and Franklin literary societies are open to both sexes; the Ionian, Eurodelphian and Browning societies admit only young women to membership; the Webster, Hamilton and Athenian societies admit young men only. Students are encouraged to join one of these organizations for the sake of practice in the use of language, training in debate, and general experience in conducting meetings and in dealing with their fellows. These societies jointly maintain a debating council, which coöperates with a Faculty committee in arranging for all intercollegiate and interstate debates participated in by representatives of the College. The oratorical board, similarly maintained by these societies, arranges for the intersociety oratorical contest.

In the School of Agriculture there are two literary societies; one for young men, the Lincoln, and one for young women, the Philomathian. These societies have the same general aims and purposes as those in the College.

AGRICULTURAL SOCIETIES

The Block and Bridle Club meets on the first and third Mondays of each month. Membership is open to all animal husbandry students above the freshman year. The object of the club is to promote the interests of animal husbandry in the College and in the state. Live-stock problems of all kinds are taken up, and members of the Faculty and outside speakers are secured for addresses on special topics.

The Agricultural Association meets Monday evenings. All students interested in agriculture are eligible to membership. The object of the association is to promote the general interests of agriculture in the College and in the state.

The Klod and Kernel Klub meets on the second and fourth Tuesdays of each month. Membership is open to junior and senior agronomy students and members of the agronomy faculty. The object of the society is to arouse more interest in agronomic work and to help students and faculty members of the Department of Agronomy to become better acquainted. Faculty and outside speakers are secured for programs.

ENGINEERING SOCIETIES

The various technical societies of the Division of Engineering meet weekly in departmental seminars for lectures, presentation of papers, and discussion of notable articles appearing in the technical press or in the journals of the national societies. On special occasions all of the societies meet together as the Engineers' Association, for lectures by eminent practicing engineers.

The students in mechanical and electrical engineering are organized as student branches of the American Society of Mechanical Engineers and the American Institute of Electrical Engineers, respectively.

The purpose of these various societies is to acquaint the students with the latest development in the fields of engineering and architecture, to give them more definite ideas as to the opportunities in their professions and the requirements for success in their professions, to promote acquaintance and fellowship among the students, and to further the interest of the Division of Engineering in the College and the state.

HONORS

In each of the divisions of the College "junior honors" are awarded at Commencement to not more than five per cent of the junior class having the highest standing up to the close of the junior year.

In a similar manner "senior honors" are awarded to not exceeding five per cent of the senior class having the highest standing up to the close of the senior year.

HONOR SOCIETIES

A chapter of Phi Kappa Phi, an honor scholarship society, membership in which is open to honor graduates of all departments of American universities and colleges, was installed at the Kansas State Agricultural College on November 15, 1915. The eligibility of undergraduates to membership is determined on the basis of their scholarship. The candidates are elected to membership at the October, April and June meetings of the chapter.

The honor society of agriculture, Gamma Sigma Delta, has as its object the encouragement of high standards of scholarship in all branches of agricultural science and education, and the encouragement of a high degree of excellence in the practice of agricultural pursuits. Seniors whose grades place them in the upper one-fourth of their class are eligible for membership. Election is in the hands of Faculty members of the local chapter.

Besides these, above mentioned, there are a number of honor fraternities, sororities and societies which are open to students in different divisions of the College or in different activities. These are treated below.

HONORARY AND PROFESSIONAL ORGANIZATIONS

The honorary and professional organizations of the College consist of fraternities, sororities, and societies. Membership in these organizations is based on scholarship and achievement. They seek to stimulate effort and to promote the interests of the various divisions or departments which they serve or represent. The list of organizations follows:

Organization	*Division or department*
Alpha Zeta	Agriculture
Forum	Debating
"K" Fraternity	Athletics
McDowell Club	Music
Omicron Nu	Home Economics
Phi Alpha Mu	Women's Science
Phi Mu Alpha	Music
Pi Kappa Delta	Debating
Purple Masque	Dramatics
Quill Club	College Writers
Scabbard and Blade	Military
Sigma Delta Chi	Industrial Journalism
Sigma Tau	Engineering
Theta Sigma Phi	Industrial Journalism
Zeta Kappa Psi	Debating

In addition to these student organizations there are chapters of Phi Kappa Phi and Gamma Sigma Delta. In both these societies election is based on scholarship and is in the hands of Faculty members. (See "Honor Societies," above.)

THE COLLEGE BAND

The College Band is a military organization, composed of cadets assigned to this duty for the College year in lieu of drill and technical military instruction. The Band is limited in its membership, and attendance of the members upon its exercises is obligatory. It has proved an effective aid to the cadet corps, stimulating a love for martial music, and affording an attractive feature of the various public ceremonial occasions at the College.

THE COLLEGE ORCHESTRA

The Orchestra is a student organization connected with the Department of Music, membership in which is voluntary. Its daily training under competent leadership results in the acquisition of a considerable repertoire of musical compositions of the best quality. Those connected with the Orchestra obtain in this way familiarity with the works of many of the great composers, and among the students at large the Orchestra is an efficient aid in cultivating a taste for and appreciation of good music.

ATHLETIC ORGANIZATIONS

By means of the gymnasium the College is prepared to give complete physical as well as mental training. This building, which is equipped with all the usual accessories, assists in developing and maintaining physical tone and health in the student body. In addition to the gymnasium classes, and physical training in the military corps of cadets, all young men are encouraged to develop their physical skill by playing on practice teams in various athletic lines. In the fall football teams are organized; in the fall and winter, basket ball; while in the spring baseball, tennis, and track athletics prevail. Every possible encouragement is given all students desirous of participating in these games to enter the practice teams and receive the necessary instruction. The most proficient of these have opportunity to enter the first teams and participate in intercollegiate contests. The College authorities encourage all reasonable and sane athletic development, as a means for the training of physical qualities desirable in men everywhere. Professionalizing tendencies are strictly repressed, and the athletic rules adopted by the Faculty prevent, by proper regulation, all participation in intercollegiate games on the part of students deficient in their studies.

The women students have equal opportunity with young men for general physical training. In the gymnasium, under a physical director, they receive training suitable for their needs. Basket-ball and tennis teams are organized among the young women.

The Division of Agriculture

FRANCIS DAVID FARRELL, *Dean*

The teaching of rational, practical agriculture is fundamental to development in a state whose principal industries are agricultural. Kansas prospers in direct proportion to the productivity of her soil and to the effectiveness with which it is utilized. Effective utilization of the agricultural resources of the state depends upon the success with which the agricultural industries of the state are developed. In order to succeed in farming it is necessary to know something of the soil, the conservation of its fertility and moisture, and its proper cultivation; the kinds of plants to grow and how to improve them; the selection, breeding, and feeding of live stock; the maintenance of orchards, gardens, and attractive surroundings; farm building, and the equipment of the farm and the farm home with modern conveniences; the best methods of marketing the products of the farm; and in addition to all this, how to make the farm home the center of influence for good citizenship in the agricultural community.

A man may learn many of these things through practical experience, and thus become successful in modern farming. But practical experience alone is slow and expensive. The Agricultural College furnishes a means of acquiring systematic training in agriculture which fits young men adequately for the farm for a moderate expenditure of time and money.

In addition to training men for service as farmers, the College prepares students for various other activities which must be carried on if the agriculture of the state and nation is to be developed properly. These activities include scientific investigation of agricultural problems in state and national institutions, agricultural extension work, teaching of agriculture, service in the industries directly involving agriculture, and a variety of other lines of public and private service of an agricultural nature. The demand for well-trained, reliable men in all these lines is always extensive. The primary aim of the College in training men in agriculture is to fit them for service in which they will develop into agricultural leaders, either as farmers or in some other capacity, and as such, contribute to the upbuilding of rural institutions and the improvement of American country life.

EQUIPMENT

The facilities for such training at this College are of a high order. The College owns 1,136 acres of land, which is used for investigation, instruction, and demonstration in the various courses in agriculture and allied branches. The campus, which comprises 160 acres, is one of the best examples of ornamental tree planting and forestry in the state. Students working daily amid such surroundings can scarcely fail to gain an appreciation or love for the beautiful. A tract of 320 acres is devoted to the work in agronomy; for horticulture and forestry work, 80 acres are used; for dairy work, about 160 acres; and for animal husbandry, about 400 acres. The herds and flocks contain all important breeds of dairy and beef cattle, hogs, horses, and sheep. Many of these animals have won championships at local and state fairs in recent years. With this class of stock available for the work in judging, the student is supplied with types of the best breeds, and becomes familiar with these types by actual handling of the stock.

CURRICULA IN AGRICULTURE

The various needs of the student of agriculture are met by the following curricula:

A four-year curriculum in agriculture.

A six-year curriculum in animal husbandry and veterinary medicine.

A three-year curriculum in agriculture in the School of Agriculture—the secondary school of the Agricultural College. (The work of the School of Agriculture is open to students of high-school grade and is discussed in another section of the catalogue.)

Various special courses. (The work of these courses is discussed in another section of the catalogue.)

DEGREES

The four-year curriculum in agriculture leads to the degree of Bachelor of Science (in agriculture).

The six-year curriculum in animal husbandry and veterinary medicine, the last two years of which are given in the Division of Veterinary Medicine, leads to the degree of Bachelor of Science at the end of four years, and to the degree of Doctor of Veterinary Medicine at the end of two more years.

THE CURRICULUM IN AGRICULTURE

The four-year curriculum in agriculture is designed to meet the needs primarily of the students who expect to return to the farm. However, the student who completes the curriculum will have had sufficient training to enable him to enter some one of the many lines of agricultural industry as a specialist. The demand for men thus trained is constantly increasing, and such positions offer attractive opportunities for men who by nature and training are adapted to the work. The United States Department of Agriculture, the state colleges and departments of agriculture, high schools, private institutions of secondary and college rank, and a great variety of commercial interests, are constantly demanding men trained in agriculture.

The young man who expects to make farming his life work can start with no better asset than the thorough training in practical and scientific agriculture afforded by the four-year curriculum. The American farmer needs more of the skill that comes through the training of the hand, in order that he may better do the work of farming; but infinitely more, he needs the training of the mind in the fundamental truths that underlie every operation in farming, in order that he may use the skill of the craftsman with reason and judgment. One may learn to plow a field with the greatest skill; the work may be a model of its kind. If, however, it is plowed with utter disregard of the moisture conditions which prevail the result may be a failure. To understand the conditions which should determine when and how to plow is the work of the trained mind; the other is the work of the trained hand. The farmer and the teacher of agriculture must possess both kinds of training, and the curriculum has been organized with this fact in view, and has been so arranged that *the student begins his practical training in agriculture on the first day he enters College.*

ANALYSIS OF THE CURRICULUM FOR THE CLASSES OF 1923, 1924, AND 1925

One hundred thirty-one semester credits in addition to military science are required for graduates, as follows:

	Semester credits	
Prescribed agriculture	45	
Electives in agriculture, required with their prerequisites	21	
Required in agriculture	—	66
Prescribed in nonagriculture	43	
Electives in nonagriculture, required	6	
Electives that may be nonagricultural	16	
Total allowed in nonagriculture	—	65
Required in military science		4
Total semester credits for graduation		135

CURRICULUM FOR CLASS OF 1926 AND SUCCEEDING CLASSES

The recent revision of the curriculum in agriculture applies only to the class of 1926 and succeeding classes; that is, only the work of the freshman year as organized in this curriculum will be offered during the College year 1922-'23. The analysis of the new curriculum is as follows:

One hundred thirty-one semester credits in addition to military science are required for graduates, as follows:

	Semester credits	
Prescribed agriculture	43	
Electives in agriculture, required with their prerequisites	21	
Required in agriculture	—	64
Prescribed in nonagriculture	44	
Electives in nonagriculture, required	6	
Electives that may be nonagricultural	17	
Total allowed in nonagriculture	—	67
Required in military science		4
Total semester credits for graduation		135

As shown in the above general outline and in the tabulated curricula given hereafter, the candidate for graduation must have completed one hundred thirty-five College semester credits. The twelve major electives required must be taken from some one of the departments of the Division of Agriculture. During the second semester of the sophomore year each student is required to file in the dean's office a formal statement of his selection of a department in which he will major. All electives must be approved by both the head of the department in which the student majors and the dean of the Division of Agriculture. The nine minor electives must support the major work. They may be taken from more than one department, and may even be selected from departments in other divisions of the College, but they must directly strengthen the student's preparation in agriculture. At the discretion of the student, with the approval of the dean of the Division of Agriculture and the head of the department in which the student is majoring, twenty-three semester hours of electives may be nonagricultural.

Any candidate for a degree in agriculture must have had at least six months' farm experience approved by the dean of the Division of Agriculture. A formal statement giving information regarding this experience must be filed in the dean's office during the last semester of the senior year.

The student who completes the freshman and sophomore years will have had, in addition to the basic work in chemistry, zoölogy, geology, botany, and English, fundamental studies in soils, farm crops, live stock, dairying, poultry husbandry, horticulture, and agricultural economics. These two years give the student a general knowledge of the whole range of agriculture, more than one-third of his time being devoted to strictly agricultural courses.

During the junior and senior years the student continues his studies of fundamental science and learns to apply science to agriculture. He is led step by step to understand the scientific relations of every farming operation. There is so much agriculture to be taught that it becomes necessary for the student to determine which of the general lines he should emphasize most. This is made possible by numerous electives in soils, crops, agricultural economics, animal husbandry, dairy husbandry, horticulture, milling, and poultry husbandry.

STATE TEACHERS' CERTIFICATES

By the selection of proper electives in the Department of Education, the four-year curriculum in agriculture may not only lead to the degree of Bachelor of Science (in agriculture), but at the same time qualify the student for the three-year Kansas state teachers' certificate, renewable for life and valid in any high school or any other public school in the state. A student desiring to qualify for teaching should begin his professional preparation by electing Psychology, first semester, junior year. A total of eighteen semester credits in the Department of Education is required for this certificate. These must include the following courses: Psychology, Educational Administration, and Educational Sociology.

STATE CERTIFICATES FOR TEACHERS OF VOCATIONAL AGRICULTURE

The electives provided in this curriculum in agriculture may be so chosen as to prepare the student for the teaching of vocational agriculture in schools participating in the federal Smith-Hughes funds.

The following courses, or their equivalent, should be included in a student's preparation for the teaching of vocational agriculture:

	Semester credits	
Professional work in education		18
Psychology D	3	
Educational Administration B	3	
Educational Sociology B	3	
Special Methods of Teaching Agriculture	3	
Observation and Supervised Teaching	3	
Agricultural Education	3	
Farm Motors		3
Farm Buildings		3
Woodwork		2
Forging I		1
Farm Shop Practice		3
Total		30

Besides these thirty credit hours of work specifically listed as needed in the preparation for the work of the Smith-Hughes teacher, Farm Organization (required in the new curriculum) should be included in the work of the student, and unless he is exceptionally strong in the practical phases of agricultural engineering, either Tractors and Trucks, or Farm Sanitation and Water Supply, or both.

In some cases all of these courses needed in the preparation for Smith-Hughes work may be included in the electives provided in the curriculum in agriculture. In other cases the student must take from six to twelve credit hours of work beyond the minimum requirements for the degree in agriculture. Many students find it desirable to do this extra work during the Summer School following graduation and immediately before they begin their work as Smith-Hughes teachers.

Candidates for the certificate in vocational agriculture must also have had not less than two full years of actual farm experience in labor or management, at least one of which shall have been continuous so as to give practical contact with farm conditions during all seasons.

THE CURRICULUM IN ANIMAL HUSBANDRY AND VETERINARY MEDICINE

A combined curriculum in animal husbandry and veterinary medicine has been outlined so that students may receive the degree of Bachelor of Science in Agriculture at the end of four years, and the degree of Doctor of Veterinary Medicine at the end of two years more, thus securing both degrees in six years.

Curriculum in Agriculture

(FOR THE CLASSES OF 1923, 1924, AND 1925)

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in laboratory work each week; and the third, where there is one, indicates the number of hours of outside work in connection with the laboratory required each week.

FRESHMAN

As this curriculum applies only to the classes of 1923, 1924 and 1925, the outline for the freshman year is omitted. Members of the class of 1926 will pursue the revised curriculum as outlined on the following page.

SOPHOMORE

First Semester		Second Semester[1]	
Organic Chemistry (Agr.) Chem. 120	3(2-3)	Quantitative Analysis I[2] Chem. 150	2(0-6)
Agricultural Economics Ag. Ec. 101	3(3-0)	Principles of Feeding An. Husb. 152	3(3-0)
Anatomy and Physiology Anat. and Physiol. 131	3(2-3) *or*	General Zoölogy Zoöl. 105	5(3-6)
Plant Physiology I[3] Bot. 208	3(3-0)	Forage Crop Production Agron. 102	3(2-2, 1)
Grain Crop Production Agron. 101	3(2-2, 1)	Judging Breeding Live Stock An. Husb. 138	2(0-6)
Plant Pathology I Bot. 116	3(1-4, 2)	Orcharding Hort. 107	2(1-3)
Farm Poultry Production Poult. Husb. 101	2(1-2, 1)	Infantry IV Mil. Tr. 104	1(0-4)
Infantry III Mil. Tr. 103	1(0-4)	Physical Education M-IV Phys. Ed. 106	R(0-2)
Physical Education M-III Phys. Ed. 105	R(0-2)		

JUNIOR

First Semester		Second Semester	
Genetics An. Husb. 221	3(3-0)	Soil Fertility Agron. 132	3(2-3)
Soils Agron. 131	4(3-3)	Agricultural Journalism Ind. Jour. 164	1(1-0)
Agricultural Microbiology Bact. 106	3(1-6)	General Entomology Ent. 101	3(2-3)
Electives[4]	7	Electives[4]	9

SENIOR

First Semester		Second Semester	
Agricultural English[5] Engl. 137	3(3-0)	Agricultural Relationships[5] Gen. Agric. 201	1(1-0)
Electives[6]: Major	6	Electives[6]: Major	6
Minor	1	Minor	5
General	3	General	4

[1] Sometime during the second semester of the sophomore year each student is required to file a written statement in the office of the Dean of the Division of Agriculture, designating the department of the division in which he will major.

[2] Students preparing for the teaching of vocational agriculture may, with the approval of the Dean of the Division of Agriculture, substitute Farm Buildings (Ag. Engr. 103) for this course.

[3] Students who do not expect to major in animal husbandry, dairy husbandry, or poultry husbandry may, with the approval of the head of the department in which they expect to major, take Plant Physiology I (Bot. 208) instead of Anatomy and Physiology.

[4] Six semester credit hours of junior electives must be chosen from courses offered in education, economics, history, mathematics, or modern languages. Students preparing to teach should take not less than nine semester credit hours of junior electives in the Department of Education. Junior electives must be officially approved before assignment by both the head of the department in which the student majors and the Dean of the Division of Agriculture.

[5] The courses in Agricultural English and Agricultural Relationships are open to seniors only.

[6] All senior electives must be officially approved before assignment by both the head of the department in which the student majors and the Dean of the Division of Agriculture.

Curriculum in Agriculture

(FOR THE CLASS OF 1926)

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in laboratory work each week; and the third, where there is one, indicates the number of hours of outside work in connection with the laboratory required each week.

FRESHMAN

First Semester		Second Semester	
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Chemistry I Chem. 101	5(3-6)	Chemistry II Chem. 102	5(3-6)
General Botany I Bot. 101	3(1-4, 2)	General Botany II Bot. 105	3(1-4, 2)
Judging Market Live Stock An. Husb. 132	2(0-6)	General Geology Geol. 103	3(3-0)
Elements of Dairying Dairy Husb. 101	3(2-3)	Dairy Judging Dairy Husb. 104	1(0-3)
Library Methods Lib. Ec. 101	1(1-0)	Judging Breeding Live Stock An. Husb. 138	2(0-6)
Agricultural Lectures Gen. Agric. 101	R(1-0)	Agricultural Lectures Gen. Agric. 101	R(1-0)
Infantry I Mil. Tr. 101	1(0-4)	Infantry II Mil. Tr. 102	1(0-4)
Physical Education M-I Phys. Ed. 103	R(0-2)	Physical Education M-II Phys. Ed. 104	R(0-2)

SOPHOMORE

First Semester		Second Semester[1]	
Organic Chemistry (Agr.) Chem. 120	3(2-3)	Elements of Horticulture Hort. 108	4(3-3)
Agricultural Economics Ag. Ec. 101	3(3-0)	Principles of Feeding An. Husb. 152	3(3-0)
Anatomy and Physiology Anat. and Physiol. 131	3(2-3)*or*	General Zoölogy Zoöl. 105	5(3-6)
Plant Physiology I[2] Bot. 208	3(3-0)	Farm Crops Agron. 109	5(3-6)
Soils Agron. 133	5(4-3)	Infantry IV Mil. Tr. 104	1(0-4)
Farm Poultry Production Poult. Husb. 101	2(1-2, 1)	Physical Education M-IV Phys. Ed. 106	R(0-2)
Infantry III Mil. Tr. 103	1(0-4)		
Physical Education M-III Phys. Ed. 105	R(0-2)		

JUNIOR

First Semester		Second Semester	
Genetics An. Husb. 221	3(3-0)	General Entomology Ent. 101	3(2-3)
Plant Pathology I Bot. 116	3(1-4, 2)	Farm Organization Ag. Ec. 106	3(2-3)
Agricultural Microbiology Bact. 106	3(1-6)	Agricultural Journalism Ind. Jour. 164	1(1-0)
Electives[3]	7	Electives[3]	9

[1] Sometime during the second semester of the sophomore year each student is required to file a written statement in the office of the Dean of the Division of Agriculture, designating the department of the division in which he will major.

[2] Students who do not expect to major in animal husbandry, dairy husbandry, or poultry husbandry may, with the approval of the head of the department in which they expect to major, take Plant Physiology I (Bot. 208) instead of Anatomy and Physiology.

[3] Six semester credit hours of junior electives must be chosen from courses offered in education, economics, history, mathematics, or modern languages. Students preparing to teach should take not less than nine semester credit hours of junior electives in the Department of Education. Junior electives must be officially approved before assignment by both the head of the department in which the student majors and the Dean of the Division of Agriculture.

SENIOR

First Semester		Second Semester	
Agricultural English[4] Engl. 137	3(3-0)	Agricultural Relationships[4] Gen. Agric. 201	1(1-0)
Electives[5]... Major	6	Electives[5]... Major	6
Minor	4	Minor	5
General	3	General	4

Agricultural Electives for Students in the Curriculum in Agriculture

AGRICULTURAL ECONOMICS

First Semester	Second Semester
Marketing of Farm Products 3(3-0)	Advanced Farm Organization 3(1-6)
Agricultural Economic Problems 3(3-0)	Agricultural Industries 2(2-0)
Advanced Agricultural Economics 3(3-0)	Agricultural Land Problems 3(3-0)
	Conservation of Agricultural Resources 2(2-0)
	Agricultural Finance 2(2-0)

Each Semester

Farm Cost Accounting 3(2-3)

Farm Organization. 3(2-3)

Agricultural Economics Seminar 1(1-0)

Research in Agricultural Economics (1 to 5 semester credits, for graduates)

AGRONOMY

First Semester	Second Semester
Seed Identification and Weed Control 2(1-3)	Crop Improvement 3(2-3)
Advanced Forage Crops 2(1-3)	Crop Ecology 2(2-0)
Advanced Soil Fertility 2(1-3)	Special Crops 2(2-0)
Grain Grading and Judging 2(0-6)	Dry-land Farming 2(2-0)
Soil Management 2(1-3)	
Principles of Agronomic Experimentation 2(2-0)	Soil Survey 2(1-3)
Pasture Management 2(1-3)	Agronomy Seminar 1(1-0)
Plant Genetics 3(3-0)	

Each Semester

Crops Research (for graduates)

Crop Problems

Soil Research (for graduates)

Soil Problems

Advanced Soils Laboratory

Pasture Management Research (for graduates)

(One or more semester credits each, according to work done)

Genetics Seminar 1(1-0)

[4] The courses in Agricultural English and Agricultural Relationships are open to seniors only.

[5] All senior electives must be officially approved before assignment by both the head of the department in which the student majors and the Dean of the Division of Agriculture.

ANIMAL HUSBANDRY

FIRST SEMESTER

Advanced Stock Judging I
2(0-6)

Form and Function in Live Stock
2(0-6)

Horse Production
3(2-3)

History of Breeds and Pedigrees
3(2-3)

Sheep Production
3(2-3)

Advanced Feeding
2(2-0)

SECOND SEMESTER

Animal Breeding
3(3-0)

Advanced Genetics
4(3-3)

Advanced Meats
(2 to 4 semester credits)

Systems of Live-stock Production
3(3-0)

Advanced Stock Judging II
2(0-6)

Beef Cattle Production
3(2-3)

Swine Production
3(2-3)

Advanced Studies in Pedigrees
3(1-6)

Animal Husbandry Seminar
1(1-0)

The Wool Industry
3(2-3)

Live-stock Marketing
2(2-0)

Live-stock Production
3(3-0)

EACH SEMESTER

Meats
2(1-3)

Genetics Seminar
1(1-0)

Research in Genetics
(4 to 10 semester credits)

Research in Animal Husbandry
(6 to 16 semester credits)

DAIRY HUSBANDRY

FIRST SEMESTER

Butter Making and Creamery Management
3(2-3)

Dairy Inspection I
2(1-3)

Dairy Breeds and Pedigrees
2(1-3)

SECOND SEMESTER

Milk Production
3(3-0)

Cheese and Ice-cream Making
3(2-3)

Advanced Dairy Judging
1(0-3)

Dairy Herd Management
2(1-3)

Dairy Seminar
1(1-0)

Market Milk
2(1-3)

EACH SEMESTER

Dairy Production Problems

Dairy Manufacturing Problems

Dairy Research

(One or more semester credits each, according to work done)

HORTICULTURE

First Semester	Second Semester
Systematic Pomology 4(2-6)	Small Fruits 2(2-0)
Farm Forestry 4(3-3)	Dendrology 3(1-6)
Practical Pomology 3(2-3)	Silviculture 3(2-3)
Spraying 2(1-3)	Market Gardening 3(2-3)
Subtropical Pomology 2(2-0)	Landscape Gardening I 2(1-3)
Advanced Pomology 3(2-3)	Home and School Gardening 3(2-3)
Horticulture Seminar 1(1-0)	Plant Materials in Landscape Gardening 3(2-3)
Greenhouse Construction and Management 3(3-0)	Landscape Gardening II 3(0-9)
History and Literature of Landscape Gardening 2(2-0)	Tree Surgery 2(1-3)
The Theory and Æsthetics of Landscape Gardening 3(2-3) (for graduates)	Landscape Gardening III 2(1-3) (for graduates)

Each Semester

Civic Art 3(3-0)

Orchard Problems

Market Gardening Problems

Pomological Research

Forcing Flowers and Vegetables

(One or more semester credits each, according to work done)

MILLING INDUSTRY

First Semester	Second Semester
Grain Marketing 3(3-0)	Grain Products 2(2-0)
Wheat and Flour Testing 4(1-9)	Experimental Baking A 2(0-6)

Each Semester

Principles of Milling 1(0-3)

Milling Practice I 3(1-6)

Milling Practice II 2(0-6)

POULTRY HUSBANDRY

First Semester	Second Semester
Practice in Poultry Feeding (1 semester credit)	Artificial Incubation and Brooding (2 to 4 semester credits)
Poultry Breeds and Types 3(1-6)	Poultry Breeding 2(0-6)
Market Poultry and Eggs 3(1-6)	Poultry Farm Organization 3(2-3)
	Poultry Bacteriology 3(1-6)

Both Semesters and Summer School

Poultry Research

(2 or more semester credits, for graduates)

Poultry Problems

(2 or more semester credits)

Curriculum in Animal Husbandry and Veterinary Medicine[1]

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

Freshman year of the Curriculum in Agriculture

SOPHOMORE

First Semester		Second Semester	
General Zoölogy Zoöl. 105	5(3-6)	Pathogenic Bacteriology I Bact. 111	4(2-6)
Anatomy I Anat. and Physiol. 102	4(2-6)	Anatomy II Anat. and Physiol. 107	9(4-15)
Grain Crop Production Agron. 101	3(2-2, 1)	Forage Crop Production Agron. 102	3(2-2, 1)
Quantitative Analysis I Chem. 150	2(0-6)	Agricultural Journalism Ind. Jour. 164	1(1-0)
Organic Chemistry (Agr.) Chem. 120	3(2-3)		
Infantry I Mil. Tr. 103	1(0-4)	Infantry II Mil. Tr. 104	1(0-4)
Physical Education M-III Phys. Ed. 105	R(0-2)	Physical Education M-IV Phys. Ed. 106	R(0-2)

JUNIOR

First Semester		Second Semester	
Embryology Zoöl. 117	3(2-3)	Principles of Feeding An. Husb. 152	3(3-0)
Anatomy III Anat. and Physiol. 111	5(1-12)	Anatomy IV Anat. and Physiol. 116	3(1-6)
Histology I Path. 101	3(1-6)	Histology II Path. 106	3(1-6)
Genetics An. Husb. 221	3(3-0)	Electives[2]	7
Electives[2]	3		

SENIOR

First Semester		Second Semester	
General Entomology Ent. 101	3(2-3)	Agricultural Relationships[3] Gen. Agric. 201	1(1-0)
Soils Agron. 131	4(3-3)	Soil Fertility Agron. 132	3(2-2, 1)
Comparative Physiology I Anat. and Physiol. 121	5(4-3)	Comparative Physiology II Anat. and Physiol. 126	3(2-3)
Agricultural English[3] Engl. 137	3(3-0)	Pathology I Path. 202	3(2-3)
Electives[2]	1	Electives[2]	6

FIFTH YEAR

Junior year of the Curriculum in Veterinary Medicine

SIXTH YEAR

Senior year of the Curriculum in Veterinary Medicine

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[1] This curriculum is so arranged that students may receive the degree of Bachelor of Science (in agriculture) at the end of four years, and the degree of Doctor of Veterinary Medicine at the end of two more years.

[2] All electives must be officially approved before assignment by both the head of the Department of Animal Husbandry and the Dean of the Division of Agriculture.

[3] The courses in Agricultural English and Agricultural Relationships are open to seniors only.

Agricultural Economics

Professor GRIMES*
Professor ENGLUND†
Associate Professor GREEN
Instructor EVANS

This department aims to give the student an understanding of facts and principles relating to the business side of farming and to agriculture as a fundamental part of the economic life of the people. The student is taught the principles of farm organization and management that are necessary to successful farming. He is also instructed in the factors and economic forces relating to marketing, credit, and other business relations among farmers as individuals and between farmers as a class and other classes in society. Instruction is not only given in present problems, but questions of the future are also considered, particularly through courses in land problems and conservation.

Principles taught in the classroom or elsewhere, and applied to practical problems, can be valuable only in so far as they are based on facts. For this reason the department conducts a number of investigations of various economic problems of agriculture. These studies provide facts for class work and other purposes and present opportunities for advanced students to engage in original research.

The department is expanding its facilities to meet the growing demand for advanced study. Opportunities of careers for those who are well trained in this field are increasingly favorable, because of the growing importance of agricultural economics to the farmer and in our national life.

COURSES IN AGRICULTURAL ECONOMICS

FOR UNDERGRADUATES

101.‡ AGRICULTURAL ECONOMICS. Sophomore year, first semester. Class work, three hours. Three semester credits. Prerequisite: Sophomore standing. Professor Englund and Associate Professor Green.

The course in agricultural economics undertakes to familiarize the student with the economic principles and forces that vitally concern every farmer. Texts: Taylor's *Agricultural Economics* and Ely and Wicker's *Elementary Principles of Economics*.

106. FARM ORGANIZATION. Junior year and elective, first and second semesters. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Ag. Ec. 101, Agron. 133, and An. Husb. 152. Professor Grimes, Associate Professor Green, and Mr. Evans.

The economic factors affecting the organization and operation of the farm business are studied with respect to their effect on the profits in farm enterprise. The course deals chiefly with the economic problems of the individual farmer on his farm. Results from actual farms are studied in the laboratory to give the student opportunity to observe the effect of the various economic factors in their influence on the farm business.

112. FARM COST ACCOUNTING. Elective, first and second semesters. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Ag. Ec. 101. Professor Grimes, Associate Professor Green, and Mr. Evans.

Various systems of farm records and accounts are studied to acquaint the student with the more practical methods. The laboratory work affords opportunity to work out problems from actual farms in which these principles are involved. Particular attention is given to determining the cost of producing farm products and to the analysis and utilization of cost of production data. Text: Scovil's *Farm Accounting*.

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* Absent on leave, 1921-'22.

† Acting head of department, 1921-'22.

‡ For an explanation of the system used in numbering courses, see the paragraph on "Course Numbers," given elsewhere in this catalogue.

FOR GRADUATES AND UNDERGRADUATES

202. MARKETING OF FARM PRODUCTS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Ag. Ec. 101. Associate Professor Green.

This course deals with the economic principles and forces that are at the basis of modern marketing problems. Study is made of the necessary services of marketing and of the comparative efficiency of various marketing methods. The course also includes a study of price making, weaknesses of the present system of marketing, possibilities for improvement, and other marketing problems. Text: Macklin's *Efficient Marketing for Agriculture.*

206. ADVANCED FARM ORGANIZATION. Elective, second semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Ag. Ec. 106. Professor Grimes and Mr. Evans.

The factors affecting the successful organization and operation of the farm business are studied by visiting farms in various parts of the state. The effects of external factors are also observed. A number of the better and more profitable farms in Kansas are visited during the course.

211. AGRICULTURAL INDUSTRIES. Elective, second semester. (Not offered in 1923-'24; alternates with Ag. Ec. 212.) Class work, two hours. Two semester credits. Prerequisite: Ag. Ec. 101. Dean Farrell.

This course deals with some of the more important phases of agriculture from the standpoint of their industrial requirements and relationships. Consideration is given to the principal geographic, economic, and social factors involved in the establishment and maintenance of the world's leading agricultural industries. The course is designed primarily to fit students to make an agricultural reconnaissance either in a settled or unsettled region; to determine what agricultural industries are suitable for a region; and to devise methods of establishing new agricultural industries or of improving industries already established. The course consists of lectures, reference work, assigned topics, and discussions.

212. CONSERVATION OF AGRICULTURAL RESOURCES. Elective, second semester. (Not offered in 1922-'23; alternates with Ag. Ec. 211.) Class work, two hours. Two semester credits. Prerequisite: Ag. Ec. 101. Open to juniors, seniors, and graduates only. Dean Farrell.

This course deals with several of the world's more important natural resources, as such, particularly those directly concerned with agriculture and the welfare of the agricultural community. Consideration is given to such matters as the size, location, and importance of these resources, their relationships to present and prospective conditions, their bearing in local, state, national, and international policies, and the place they should occupy in public opinion and citizenship. The course consists of lectures, reference work, assigned topics, and discussions.

218. AGRICULTURAL LAND PROBLEMS. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Ag. Ec. 101. Professor Englund.

This course includes a study of the ownership of land, the land policies of various important governments, state aid in land settlement, land taxation, and the Torren's system of registration in land transfer. It consists of lectures, assigned readings, topics for reports, and discussion.

221. AGRICULTURAL FINANCE. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Ag. Ec. 101. Associate Professor Green.

Studies are made of the organization of agricultural land credit and short-time rural credit, the coöperative credit systems of Europe and other countries, the federal farm-loan act of the United States, coöperative insurance societies, and the problems of financing landowners, tenants, and farm laborers. Texts: Morman's *Principles of Rural Credits* and Laugh's *Business Finance.*

226. AGRICULTURAL ECONOMIC PROBLEMS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Ag. Ec. 101. Professor Englund.

Problems of a more advanced nature than those considered in the first course in agricultural economics are taken up. These include the problems of intensity of culture, national agricultural policies, international agricultural relationships, agricultural legislation, agricultural labor, and other agricultural economic problems.

231. AGRICULTURAL ECONOMICS SEMINAR. Elective, both semesters. Class work, one hour. One semester credit. Prerequisite: Ag. Ec. 101. Professor Grimes, Professor Englund, and Associate Professor Green.

Current questions in agricultural economics are reviewed and discussed and topics are prepared and presented by the students.

FOR GRADUATES

301. RESEARCH IN AGRICULTURAL ECONOMICS. Elective, both semesters and summer school. One to five semester credits. Prerequisites: Consult instructors. Professor Grimes, Professor Englund, Associate Professor Green, and Dean Farrell.

This course involves individual research problems in the marketing of farm products, coöperation among farmers, land problems, tenancy, agricultural industries, agricultural finance, farm labor, farm power, farm organization, and the cost of producing farm products. Any of the subjects assigned may furnish data for a master's thesis.

305. ADVANCED AGRICULTURAL ECONOMICS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisites: Consult instructor. Professor Englund.

This course is a study of the principles of economics with an agricultural emphasis and is designed to meet the needs of advanced students by giving them a stronger foundation in fundamentals. The course consists of planned reading in the works of leading economists, and discussion of principles and their application to problems which specialists in agricultural economics must face.

Agronomy

Professor CALL
Professor SALMON
Professor THROCKMORTON
Associate Professor PARKER
Associate Professor HENSEL
Associate Professor SEWELL
Associate Professor ZAHNLEY
Associate Professor LAUDE
Assistant Professor DAVIS
Assistant Professor DALE
Instructor LYONS
Assistant HARLING
Assistant PHINNEY

The College farm used by the Department of Agronomy comprises 320 acres of medium rolling upland soil, well suited to experimental and demonstration work. It is well equipped with all kinds of farm machinery necessary in crop production. The general fields and experimental plots used for the breeding and testing of farm crops, and for conducting experiments in soil fertility and methods of culture, afford the student excellent opportunities for study and investigation.

Large and well-equipped laboratories for soil and crop work are maintained for the regular use of students. Material is provided for the study of the grain and forage crops best adapted to different purposes and most suitable for growing in the state. Ample greenhouse space is provided for problems and research work in crops and soils.

The Department of Agronomy offers courses in cereal and forage crop production and improvement, in pasture management, in soils, soil fertility, soil survey, and dry-land farming.

COURSES IN FARM CROPS

FOR UNDERGRADUATES

101. GRAIN CROP PRODUCTION. Sophomore and junior years, first semester and summer school. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Bot. 101. Associate Professor Zahnley and Assistant Professor Davis.

This course is a study of the distribution, relative importance, and production of grain crops, including wheat, corn, oats, barley, rye, rice, buckwheat, and flax.

102. FORAGE CROP PRODUCTION. Sophomore year, second semester and summer school. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Bot. 101. Associate Professor Zahnley and Assistant Professor Davis.

This course is a study of the distribution, relative importance, value, and production of forage crops, including sorghums, alfalfa, clover, and the grasses.

103. FARM CROPS. Sophomore year, second semester. Class work, three hours; laboratory, three hours. Four semester credits. Assistant Professor Davis.

This course consists of a study of the more important grain and forage crops, especially from the production viewpoint.

105. SEED IDENTIFICATION AND WEED CONTROL. Elective, first semester and summer school. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisites: Agron. 101 and 102 or 109. Associate Professor Zahnley and Mrs. Harling.

Methods of propagation, control, and eradication of weeds are discussed in lectures. The laboratory period is devoted to the identification of weed plants, and seeds; to germination and purity testing; and to field trips.

107. SPECIAL CROPS. Elective, second semester. Class work, two hours. Two semester credits. Prerequisites: Agron. 101 and 102 or 109. Associate Professor Zahnley.

The distribution, climatic and soil requirements, relative importance, and production of sugar beets, cotton, flax for fiber, hemp, tobacco, and other minor crops are studied.

108. GRAIN GRADING AND JUDGING. Elective, first semester and summer school. Laboratory work, six hours. Two semester credits. Offered coöperatively by the Departments of Agronomy and Milling Industry. Prerequisites: Agron. 101 and 102 or 109. Professor Fitz, Professor Salmon, and Associate Professor Zahnley.

The principal feature of this course is practice work in grading and judging crops and crop products, including wheat, corn, oats, barley, rye, buckwheat, flax, rice, alfalfa, clover, soy beans, cowpeas, and various kinds of hay.

109. FARM CROPS. Sophomore year, second semester. (Not offered until 1923-'24.) Class work, three hours; laboratory, six hours. Five semester credits. Prerequisite: Bot. 101. Associate Professor Zahnley and Assistant Professor Davis.

This course is a study of the distribution, relative importance, value, and production of the more important grain and forage crops.

FOR GRADUATES AND UNDERGRADUATES

201. CROP IMPROVEMENT. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Agron. 101 and 102 or 109 and An. Husb. 221. Professor Parker.

This course reviews the principles of plant breeding and applies them to the principal groups of field crops. Methods of selection, hybridization, and breeding for special qualities are discussed. Laboratory work is a study of heritable characters and of their behavior in several generations following the cross.

203. ADVANCED FORAGE CROPS. Elective, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite, Agron. 102 or 109. Associate Professor Zahnley.

Results of the most recent investigations carried on with forage crops in this and in other countries are studied, together with a more intensive study of the sorghums, alfalfa, sweet clover, soy beans, and other important or promising forage crops.

Laboratory.—The laboratory work is devoted to a study of the growth habits of the crops considered in the lecture, especially as they are related to the production and improvement of these crops. Storing, market grading, and marketing of hay are also considered.

205A. PRINCIPLES OF AGRONOMIC EXPERIMENTATION. Elective, first semester. Class work, two hours. Two semester credits. Prerequisites: Agron. 201 and 133. Professor Salmon.

A discussion of the principles of experimentation in general is followed by their application to agronomic problems. Important contributions to agronomic science are studied from the historical viewpoint.

206. AGRONOMY SEMINAR. Elective, second semester. Class work, one hour. One semester credit. Prerequisites: Agron. 101, 102 or 109 and 133. Professor Call.

In this course students are required to review before the class timely articles appearing in bulletins and current periodicals.

207. PASTURE MANAGEMENT. Elective, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisites: Bot. 102 and Agron. 102 or 109. Associate Professor Hensel.

This course will be taken up in two parts: First, native forage plants, their distribution, value, life history and habits, and their management. Second, management of pastures and ranges, including the determination of carrying capacity, character of stock best suited to a range or pasture and the proper methods of handling areas to maintain or increase the forage cover.

208. PLANT GENETICS. Elective, first semester. (Not offered in 1922-'23.) Class work, three hours. Three semester credits. Prerequisite: An. Husb. 221. Professor Parker.

This course is an advanced course in genetics and is offered to those students interested in plant breeding. Lectures and reference reading will deal with fundamental principles of breeding as they have been worked out in plants.

209. GENETICS SEMINAR. Elective, first and second semesters. One semester credit. Prerequisites, consult instructors. Professor Lippincott, Professor Nabours, Professor Parker, and Assistant Professor Ibsen.

This course continues through the first and second semesters and includes the study and criticism of genetic experiments in plants and animals, the biological and mathematical methods employed, and the validity of conclusions drawn.

210. CROP PROBLEMS. Elective, both semesters and summer school. Laboratory, three to twelve hours. One to four semester credits. Prerequisite: Agron. 203. Professor Salmon and Professor Parker.

Students choose or are assigned special problems for study. The completion of the work with a written report entitles them to credit according to the amount and quality of the work done.

211. CROP ECOLOGY. Elective, second semester. Class work, two hours. Two semester credits. Prerequisites: Agron. 101 and 102 or 109. Professor Salmon.

This course considers the distribution of farm crops with special reference to the climatic, edaphic, economic and social factors primarily responsible for the concentration of crop production in certain countries. The possibilities

of further increase in crop-producing areas and the probable nature and direction of such increases are considered.

FOR GRADUATES

301. CROPS RESEARCH. Elective, both semesters and summer school. Laboratory, three to fifteen hours. One to five semester credits according to the work done. Prerequisite: Agron. 203. Professor Salmon and Professor Parker.

Students choose or are assigned special problems which may furnish data for a master's thesis. The completion of the work entitles them to credit according to the amount of work done.

302. PASTURE MANAGEMENT RESEARCH. Elective, both semesters and summer school. One to five semester credits, depending on the work done. Prerequisites: Agron. 207, Civ. Engr. 111, Bot. 225. Associate Professor Hensel.

Students choose or are assigned special problems for investigation. The investigations may furnish data for a master's thesis.

COURSES IN SOILS

FOR UNDERGRADUATES

131. SOILS. Junior and senior years, first semester. Class work, three hours; laboratory, three hours. Four semester credits. Prerequisite: Chem. 102 or 108. Professor Throckmorton, Associate Professor Sewell, and Mr. Lyons.

This course deals with the origin and formation of soils and their classification and composition as influenced by method of formation and climatic condition. Special attention is given to the management of soils required to conserve moisture and liberate plant food.

132. SOIL FERTILITY. Junior and senior years, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Chem. 150 and Agron. 131. Professor Call, Professor Throckmorton, Associate Professor Sewell, and Mr. Lyons.

Factors influencing the fertility of the soil, the effect of different systems of farming on soil fertility, and management of the soil to conserve its fertility receive most attention in this course.

133. SOILS. Sophomore year, first semester. (Not offered until 1923-'24.) Class work, four hours; laboratory, three hours. Five semester credits. Prerequisites: Chem. 102 or 108 and Geol. 101. Professor Call, Professor Throckmorton, Associate Professor Sewell, and Mr. Lyons.

This course deals with the fundamental principles underlying the management of soils.

FOR GRADUATES AND UNDERGRADUATES

231. DRY-LAND FARMING. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Agron. 131. Professor Throckmorton.

The principles underlying the cultivation methods and farming systems under light rainfall conditions are studied.

232. ADVANCED SOIL FERTILITY. Elective, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Agron. 132. Professor Throckmorton.

This course deals with the use of commercial fertilizers and their effects upon plants and soil.

233. SOIL SURVEY. Elective, second semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Agron. 131. (Not offered in the year 1922-'23.) Professor Throckmorton.

Types of soils of the United States and methods of mapping soil areas are studied in this course. Special attention is given to the study of Kansas soils in the field.

234. SOIL MANAGEMENT. Elective, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Agron. 132. Professor Throckmorton.

This course deals with the management of soils under irrigation and with the management of wet, sandy, and eroded soils and with other types requiring special methods of working.

235. ADVANCED SOILS LABORATORY. Elective, first and second semester, or both. One to four semester credits, according to the amount of work done. Prerequisite: Agron. 132. Professor Throckmorton and Mr. Lyons.

This course deals with the more advanced problems of soil physics and fertility and includes the making of mechanical analyses, the determination of moisture equivalent, specific heat, and pot work with soils in the greenhouse.

236. SOIL PROBLEMS. Elective, both semesters and summer school. Laboratory, three to twelve hours. One to four semester credits. Prerequisites depend on the problem given. Professor Call, Professor Throckmorton, and Associate Professor Sewell.

Students choose or are assigned special problems in soils.

FOR GRADUATES

331. SOIL RESEARCH. Elective, both semesters and summer school. One to five semester credits, according to the work done. Prerequisites: Agron. 132 and Chem. 150. Professor Call, Professor Throckmorton, and Associate Professor Sewell.

Students are assigned special soil problems, which may extend throughout the year and furnish data for a master's thesis.

Animal Husbandry

Professor MCCAMPBELL
Professor PATERSON
Professor BELL
Associate Professor IBSEN
Associate Professor WINCHESTER
Assistant Professor ANDERSON
Assistant Professor AUBEL
Instructor MACKINTOSH
Assistant MARSTON
Fellow LAMBERT
Fellow HORLACHER

The courses of study in this department are arranged to give the student special instruction in the selection, breeding, feeding, marketing, and management of all classes of live stock.

The department devotes 550 acres of land to the maintenance of herds and flocks of pure-bred horses, cattle, sheep, and hogs. The College live stock has attained a national reputation among breeders and feeders on account of the many prize-winning animals produced.

The feed yards and barns are well arranged for experimental feeding and the maintenance of the herds. The laboratory of the animal husbandry student is the feed lot and the judging pavilion. He studies the animal from the standpoint of the breeder and of the feeder. He learns to combine the needs of each and to find these qualities in the animal best suited to meet these needs.

COURSES IN ANIMAL HUSBANDRY

FOR UNDERGRADUATES

132. JUDGING MARKET LIVE STOCK. Freshman year, first semester and summer school, 1922. Laboratory, six hours. Two semester credits. Professor Paterson, Assistant Professor Anderson, Assistant Professor Aubel, Mr. Mackintosh, and Mr. Horlacher.

This course consists of a study of conformation and quality in market live stock. Text: Vaughn's *Types and Market Classes of Live Stock.*

Laboratory.—Practice is given in scoring and comparing market animals.

135. JUDGING LIVE STOCK (VET.). Sophomore year, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Professor Paterson.

One-fourth of this course is given by members of the Dairy Husbandry Department. A study is made of market and breeding horses, beef cattle, dairy cattle, sheep, and swine. Text: Vaughn's *Types and Market Classes of Live Stock.*

Laboratory.—Practice is given in scoring and judging market and breeding animals.

138. JUDGING BREEDING LIVE STOCK. Freshman year, second semester and summer school, 1922. Laboratory, six hours. Two semester credits. Prerequisite: An. Husb. 132. Professor Paterson, Assistant Professor Aubel, and Mr. Mackintosh.

This course consists of a study of conformation, quality, and character in breeding animals and the breed characteristics of the various breeds of horses, cattle, sheep, and swine. Text: Plumb's *Types and Breeds of Farm Animals,* and Gay's *Principles and Practice of Judging Livestock.*

140. ADVANCED STOCK JUDGING I. Elective, first semester. Laboratory, six hours. Two semester credits. Prerequisite: An. Husb. 138. Professor Bell.

This course deals with the judging of market animals as well as with the different breeds of pure-bred stock. The stock is judged in groups of from four to six animals in the same manner as is customary at county or state fairs.

143. ADVANCED STOCK JUDGING II. Elective, second semester. Laboratory, six hours. Two semester credits. Prerequisite: An. Husb. 140. Professor Bell.

This is a continuation of An. Husb. 140. During the work of the semester occasional trips are made to the best live-stock farms of the state, where the students have an opportunity to judge and to observe the management of herds and flocks as handled by the most successful stockmen of the state.

146. FORM AND FUNCTION IN LIVE STOCK. Elective, first semester. Laboratory, six hours. Two semester credits. Prerequisite: An. Husb. 143. Professor Bell.

A detailed and specific study is made of animal form and type, and influence of type upon function; also of the relation of form, type and condition to growth and development. Comparative measurements are taken of growing and fattening animals, speed and draft horses, mutton and wool sheep, and lard and bacon types of hogs. Special training is given in presenting orally the relative merits of animals of all breeds.

149. HISTORY OF BREEDS AND PEDIGREES. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: An. Husb. 132. Mr. Mackintosh.

A study is made of the early history and development of pure-bred domestic animals; also a sufficient study of herdbooks and pedigrees to acquaint students with the leading strains and families of the different breeds of horses, cattle, sheep, and swine. Text: Plumb's *Types and Breeds of Farm Animals.*

152. PRINCIPLES OF FEEDING. Sophomore and junior years, second semester and summer school. Class work, three hours. Three semester credits. Prerequisites: Anat. 132 and Chem. 120. Associate Professor Winchester.

This course involves a study of the digestive system and the processes of nutrition, the origin, chemical analysis, grades, and feeding values of different feeds, and of the theory of practical economy of rations, both for the maintenance and for the fattening of all classes of farm animals. Text: Henry and Morrison's *Feeds and Feeding,* Parts I and II, supplemented by lectures.

155. BEEF-CATTLE PRODUCTION. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: An.

Husb. 140, 149, 152, and 223. Professor McCampbell and Assistant Professor Aubel.

This course includes the study of economical methods of growing and fattening market cattle and up-to-date methods of breeding, developing, fitting, and marketing pure-bred beef cattle. The laboratory includes practice in feeding, management, and housing of cattle.

158. SWINE PRODUCTION. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: An. Husb. 140, 149, 152, and 223. Assistant Professor Anderson.

This course comprises a systematic study of economical methods of growing, fitting, and finishing swine, both for breeding purposes and for the market. The laboratory work includes practice in feeding, management, and housing of swine. Text: Smith's *Pork Production.*

161. SHEEP PRODUCTION. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: An. Husb. 140, 149, 152, and 223. Professor Paterson.

A systematic study is made of economic methods of growing, fitting, and finishing sheep, both for breeding purposes and for market. The laboratory work includes practice in feeding, management, and housing of sheep. Text: Coffey's *Productive Sheep Production.*

164. HORSE PRODUCTION. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: An. Husb. 140, 149, 152, and 223. Professor Bell.

This course includes a study of economic methods of growing, handling, and housing horses for breeding purposes, for work, and for the market. The laboratory work includes practice in feeding, handling, and housing horses. Text: Gay's *Productive Horse Husbandry.*

167. MEATS. Elective, both semesters. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisites: An. Husb. 138 and 152. Professor Paterson.

This is a course in killing, and in dressing, cutting, and curing meats.

171. LIVE-STOCK PRODUCTION. Elective, second semester. Open only to juniors and seniors not majoring in animal husbandry. Class work, three hours. Three semester credits. Prerequisite: An. Husb. 152. Professor Bell.

The purpose of this course is to give students not majoring in animal husbandry a practical insight into the production of beef cattle, horses, swine, and sheep.

172. FEEDING LIVE STOCK. For Agricultural Engineers only. Junior year, second semester. Class work, three hours. Three semester credits.

This course includes a study of the processes of digestion and assimilation, the food requirements of different animals, methods of calculating rations, and the relative feeding value of different feeds. Text: Henry and Morrison's *Feeds and Feeding.*

FOR GRADUATES AND UNDERGRADUATES

221. GENETICS. Junior year, first semester and summer school. Class work, three hours. Three semester credits. Prerequisites: Zoöl. 105, and Bot. 105. Associate Professor Ibsen.

This course embraces a general discussion of variation, Mendelian inheritance, and related subjects.

223. ANIMAL BREEDING. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: An. Husb. 221. Assistant Professor Aubel.

This course embraces a study of the physiology of reproduction; general principles of heredity; variation; systems of mating; influence of pedigrees and herdbook standards; and an analysis of the breeding practices of leading breeders.

225. ADVANCED GENETICS. Elective, second semester. Class work, three hours; laboratory, three hours. Four semester credits. Prerequisite: An. Husb. 221. Associate Professor Ibsen.

Particular attention is given to the relation of the chromosomes to heredity. The subject as a whole is studied in greater detail than in An. Husb. 221.

227. GENETICS SEMINAR. Elective, first and second semester. One semester credit. Prerequisites: Consult instructors. Professors Nabours, Lippincott, Ibsen, and Parker.

This course continues through the first and second semesters and includes the study and criticism of genetic experiments in plants and animals, the biological and mathematical methods employed, and validity of conclusions drawn.

229. RESEARCH IN GENETICS. Elective, first and second semesters. Four to ten semester credits. Prerequisite: An. Husb. 225. Associate Professor Ibsen.

This course continues through the year and offers opportunity for individual study of problems in which small mammals are used as the experimental animals.

231. ADVANCED STUDIES IN PEDIGREES. Elective, second semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: An. Husb. 149. Mr. Mackintosh.

This course consists of a careful study of the pedigrees and the prepotency of individuals representing the more important strains and families of beef cattle, horses, sheep, and swine.

233. ADVANCED FEEDING. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: An. Husb. 152. Associate Professor Winchester.

This course consists of a survey of the experimental feeding of horses, cattle, sheep, and hogs, together with a study of the fundamental and practical feeding problems of the various sections of the country. Emphasis is placed upon the results obtained in the experimental investigation of these problems.

244. ANIMAL HUSBANDRY SEMINAR. Elective, second semester. Open only to seniors and graduates majoring in animal husbandry. Class work, one hour. One semester credit. Prerequisite: An. Husb. 152. Associate Professor Winchester.

FOR GRADUATES

301. RESEARCH IN ANIMAL HUSBANDRY. Elective, first and second semesters. Prerequisites: An. Husb. 155, 158, 161, and 164. Six to sixteen semester credits. Professor McCampbell.

Students are assigned special problems for investigation in beef cattle production, swine production, sheep production, horse production, pure-bred live-stock production and genetics.

306. ADVANCED MEATS. Elective, second semester. Two to four semester credits. Prerequisite: An. Husb. 167. Professor Paterson.

This course includes grading of carcasses, studies in nutritive values of different grades of meats, factors influencing the quality of meats, factors influencing dressing percentage of meat animals, and the identification of meats from different animals.

311. THE WOOL INDUSTRY. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: An. Husb. 161. Professor Paterson.

This course includes a study of the supply of wool and the demand for it, and the method of producing, marketing, storing, grading, and manufacturing wool.

316. SYSTEMS OF LIVE-STOCK PRODUCTION. Elective, second semester. Class work, three hours. Three semester credits. Prerequisites: An. Husb. 155, 158, 161, and 164. Professor McCampbell.

This course includes a study of the relation of live-stock production to agriculture. It also includes a study of management, climate, soil, topography, location of markets, land, labor, capital, and managing ability as factors influencing the choice and adaptation of systems of production.

321. LIVE-STOCK MARKETING. Elective, second semester. Class work, two hours. Two semester credits. Prerequisites: An. Husb. 155, 158, 161, and 164. Professor McCampbell.

This course includes a study of the art of marketing live stock and live-stock products; freight and insurance rates in transit, liability of carrier and shipper, terminal charge, etc.; commissions for sale of storage; the relation of market prices of grain and hay to contemporary values of live-stock meat.

Dairy Husbandry

Professor FITCH
Associate Professor CAVE
Associate Professor OLSON
Instructor BECKER
Instructor MCGILLIARD
Assistant RENNER

The activities of the Department of Dairy Husbandry may be divided into two groups: those that deal with the production of milk and those that deal with the marketing and manufacturing of the several dairy products. In order to get first-hand information a dairy herd is maintained and a creamery operated. The animals in the dairy herd are used by judging classes and in experiments in the feeding, care, and management of dairy animals. Up-to-date methods in creamery operation are exemplified in the creamery.

The dairy herd consists of excellent types of the four dairy breeds: Jersey, Guernsey, Ayrshire, and Holstein. These animals are pure bred, and a number have been entered in the advanced registry of their respective breeds. The excellence of the herd is shown by the yearly records of the cows that have been officially tested. The average for the Guernseys is 8,717 pounds of milk and 425 pounds of butter fat; for the Ayrshires, 11,805 pounds of milk and 454 pounds of butter fat; for the Holsteins, 14,777 pounds of milk and 491 pounds of butter fat; and for Jerseys, 9,176 pounds of milk and 484 pounds of butter fat. The herd contains the following individuals with outstanding records: Carlotta Empress Fobes, a four-year-old Holstein having the highest milk record in the state for her age; Canary Bell, an Ayrshire having the highest record for mature Ayrshires in the United States in 1918 and the highest Ayrshire record ever made in Kansas; and Owl's Design, the highest record Jersey in the state.

Students who have specialized in dairying are now among the leading dairy-cattle breeders of the state. Others who were interested in the manufacturing side of dairying are in responsible positions with creameries and milk companies or in business for themselves. The dairy industry is expanding in Kansas, and this is bringing a greater demand for men with experience and knowledge of dairying.

The instruction in the Department of Dairy Husbandry includes the study of the selection and breeding of dairy animals, the production of milk, its manufacture into butter, cheese, and other dairy products, and its sale on the market. The success of the instruction in judging dairy animals may be assumed from the fact that for the years 1919, 1920, and 1921 the dairy judging teams of this College have won first place in the students' national dairy judging contest at the National Dairy Show.

COURSES IN DAIRY HUSBANDRY

FOR UNDERGRADUATES

101. ELEMENTS OF DAIRYING. Freshman year, first semester and summer school. Class work, two hours; laboratory, three hours. Three semester credits. Professor Fitch, Associate Professors Cave and Olson, and Mr. Renner.

This is a general course in dairying, dealing with the secretion, composition and properties of milk, with the factors influencing the quantity and quality of milk, and with care of milk and cream on the farm. It includes a study of the different methods of creaming, the construction and operation of farm separators, the principles and application of the Babcock test, the use of the lactometer, and butter making on the farm. Lectures supplemented by text, Stocking's *Manual of Milk Products.*

Laboratory.—Practice is given in operating the Babcock test and lactometer, separation of milk, and farm butter making.

102. JUDGING LIVE STOCK (VET.). Sophomore year, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Mr. McGilliard.

One-fourth of this course, which is described more fully under the Department of Animal Husbandry, is given by members of the Department of Dairy Husbandry, and comprises the judging and scoring of dairy cattle.

104. DAIRY JUDGING. Freshman year, second semester and summer school. Laboratory, three hours. One semester credit. Associate Professor Cave, Mr. Becker, and Mr. McGilliard.

This course calls for the judging of dairy stock from the standpoint of economical production and breed type. Score cards are used for the purpose of training the student to become accurate, thorough and systematic in the selection of animals as representative of breeds or for breeding purposes. No textbook is required. *Types and Breeds of Farm Animals,* by C. S. Plumb, and Breeder's Association literature are used as references.

106. DAIRY INSPECTION I. Elective, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisites: Bact. 106, and Dairy Husb. 101. Associate Professor Olson.

Advanced work is given in the testing of dairy products, including testing for adulterations. Practice is given in the use of score cards for inspecting and grading milk depots, dairy farms, and creameries. The course is designed to give training in the duties of a city, state, or government inspector or commissioner. State and city ordinances governing the handling and public sale of dairy products are outlined. Text: Farrington and Woll's *Testing Milk and Its Products.*

108. MILK PRODUCTION. Elective, second semester. Class work, three hours. Three semester credits. Prerequisites: Dairy Husb. 101 and An. Husb. 152. Professor Fitch.

This course deals with the economical production of milk and with the most approved method of handling the dairy herd, also the construction of dairy barns and buildings, and other subjects which relate to the dairy farmer.

110. BUTTER MAKING AND CREAMERY MANAGEMENT. Electives, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Dairy Husb. 101 and Bact. 211. Associate Professor Olson.

This course comprises a study of the principles of creamery butter making, the construction and care of creameries and their appliances, methods of sampling and grading cream, Pasteurization, starter making, cream ripening, and creamery accounting. Text: Hunziker's *The Butter Industry.*

Laboratory.—Practice is given in the sampling and grading of milk and cream; in separating and ripening cream; in the preparation and use of the starter in Pasteurized and in raw cream; in churning; in working, washing, salting, and packing butter; and in keeping complete records of each operation. The work also includes the making of salt, fat, and moisture determinations of the finished product, and judging and scoring butter.

112. HOME DAIRYING. Elective, last half of second semester. Class work, two hours; laboratory, three hours. One and one-half semester credits. Mr. Renner.

This course includes a study of the composition of milk, Babcock testing, separation of milk, cream ripening, and farm butter making; also a brief study

of the breeds of dairy cattle. It is given with the elective course, Poult. Husb. 102, which is offered the first half of the second semester.

114. CHEESE AND ICE-CREAM MAKING. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Bact. 211 and Dairy Husb. 101. Associate Professor Olson.

This course includes the making of cheese on the farm for home use and for sale, and the commercial manufacture of Cheddar cheese, comprising each detail from the receipt of the milk to the marketing of the finished product. The cheese work is given the first half of the semester; the manufacture and handling of ice cream and ices for the retail and wholesale trade in the second half. Text: Van Slyke-Publow's *The Science and Practice of Cheese Making.*

Laboratory.—Practice is given in making cheese under farm conditions and on a commercial scale. Records are kept of the different operations, and their influence upon the finished product is noted. Exercises are given in testing, judging and scoring cheese. The latter half of the semester is devoted to the making of ice cream and ices.

116. MARKET MILK. Elective, second semester. Lecture, one hour; laboratory, three hours. Two semester credits. Prerequisites: Dairy Husb. 101 and Bact. 211. Associate Professor Olson.

This course includes a study of the classes of market milk (certified, inspected and Pasteurized, also other classifications), equipment and methods for clean milk production, and the relation of clean milk to producer, dealer, and consumer. Also systems of milk inspection, score cards, and milk and cream contests. Lectures are also given on milk plants, including their methods and equipment, such as receiving, storing, separating, removing sediment, Pasteurization, bottling and capping, cleaning and sterilizing bottles and cans, the use of homogenizer and emulsifier and practical laboratory methods of examining milk.

Laboratory.—The work includes actual practice in all the steps in the production of market milk and cream in the College milk plant.

118. DAIRY INSPECTION II. Senior year, second semester. Laboratory, three hours. One semester credit. Associate Professor Olson.

This course comprises the testing of dairy products, the inspection and scoring of dairies and milk depots, and the testing for adulterants in dairy products. Text: Farrington and Woll's *Testing Milk and Its Products.*

120. ADVANCED DAIRY JUDGING. Elective, second semester. Laboratory, three hours. One semester credit. Associate Professor Cave.

This course is a continuation of Dairy Husb. 104. Visits are made to the best farms in the state and students are given an opportunity to judge and to handle stock kept by the most successful breeders.

FOR GRADUATES AND UNDERGRADUATES

202. DAIRY SEMINAR. Elective, second semester. Class work, one hour. One semester credit. Prerequisites: Dairy Husb. 101, 106, and 108. Professor Fitch.

This course includes a study and review of dairy periodicals and experiment station bulletins, books and other dairy literature.

206. DAIRY HERD MANAGEMENT. Elective, second semester, senior year. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Dairy Husb. 108. Professor Fitch and Associate Professor Cave.

This course is an advanced course in the feeding and management of the dairy herd. It takes up the study of feeding, the management of advanced registry cows, the fitting of animals for show and sale, and other subjects pertaining to the management of dairy herds.

Reference Texts: Larson and Putney's *Dairy Cattle Feeding and Management,* and Eckles' *Dairy Cattle and Milk Production.*

211. DAIRY BREEDS AND PEDIGREES. Elective, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Dairy Husb. 108. Associate Professor Cave.

This course is devoted to a study of the history and development of the different breeds of dairy cattle. In the laboratory a study is made of the herd books of the dairy breeds and a study of the pedigrees of some of the prominent animals of each breed.

216. DAIRY PRODUCTION PROBLEMS. Elective, both semesters. Credit as arranged. Prerequisites: Dairy Husb. 101, 104, and 108, and An. Husb. 152. Professor Fitch and Associate Professor Cave.

In this course the student is allowed to follow some investigation pertaining to dairy production problems. Plans for this investigation should be so formulated that the study could be continued for more than one semester if necessary.

221. DAIRY MANUFACTURING PROBLEMS. Elective, both semesters. Credit as arranged. Prerequisites: Dairy Husb. 101, 106, 108, 110, and 114. Associate Professor Olson.

In this course the student is allowed to follow some investigation pertaining to dairy manufacturing problems. Plans for this investigation should be so formulated that the study could be continued for more than one semester if necessary.

FOR GRADUATES

301. DAIRY RESEARCH. Elective, both semesters. Credit as arranged. Prerequisites: Dairy Husb. 108 and 110. Professor Fitch.

This course gives credit for special investigations in dairy husbandry which may form the basis of a thesis in partial fulfillment of the requirements for the degree of master of science.

General Agriculture

DEAN FARRELL

FOR UNDERGRADUATES

101. AGRICULTURAL LECTURES. Freshman year, first and second semesters. Lectures, one hour a week. Deans of the Division of Agriculture, Veterinary Medicine, Extension, and the Summer School, and heads of the departments of the Agricultural Experiment Station and of various other departments of the College.

These lectures have a twofold object: (1) To assist freshmen to develop ability to study efficiently, and (2) to inform freshmen regarding the prospective opportunities for those who prepare themselves for service in the various fields of work open to agricultural graduates, and the requirements for success in those fields; and regarding the relationships between agricultural subject matter and certain other kinds of subject matter in well-balanced agricultural training.

FOR GRADUATES AND UNDERGRADUATES

201. AGRICULTURAL RELATIONSHIPS. Senior year, second semester. Class work, one hour. One semester credit. Open to seniors in agriculture and to graduates only. Dean Farrell.

This course is designed for agricultural students who are about to enter upon their life work. It is given for the purpose of directing the attention of these students to their duties, responsibilities, and opportunities for service as citizens of the agricultural community and as specialists in various phases of agricultural activity. It consists of lectures and discussions relating to the broad, fundamental relationships of individual farmers and other agricultural people with each other, and of the agricultural community with other communities. The course places special emphasis in this connection on the responsibilities, obligations, and opportunities of agricultural graduates as American citizens.

Horticulture

Professor DICKENS
Professor BARNETT
Assistant Professor PICKETT
Assistant Professor WIEDORN
Instructor BALCH

A wealth of illustrative material for classes in all horticultural subjects is found in the large collection of species growing upon the College campus, in the orchard plantations, and in the greenhouses.

The horticultural grounds consist of eighty acres of land devoted exclusively to horticultural and forestry work in gardens, nurseries, orchards, and vineyards. A new small-fruit plantation is being developed, in which will be planted all standard kinds of small fruits. A full equipment of garden tools, spraying machinery and accessories, pruning tools, and special apparatus for floriculture is available at all times for the use of students. The College grounds furnish one of the finest and most complete laboratories in the state for the study of landscape gardening.

The instruction in the Department of Horticulture covers horticulture, pomology including fruit judging, vegetable gardening, small fruits, spraying, orcharding, greenhouse problems, forestry, and all phases of landscape gardening.

Instruction in landscape gardening is planned to meet the requirements of two classes of students: (1) Students who wish a better understanding of the principles underlying landscape gardening; (2) students who wish to specialize in landscape gardening. A complete course, with the coöperation of the Departments of Civil Engineering and Architecture, is offered the latter students.

COURSES IN HORTICULTURE

FOR UNDERGRADUATES

101. PLANT PROPAGATION. Freshman year, second semester. (Not required of the class of 1926.) Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Bot. 101. Assistant Professor Pickett.

This course includes a discussion of natural and cultural methods of propagation; seeds, seed testing, and seed growing; the treatment required for different kinds of seeds, the production of seedlings for stocks; grafting, budding, layering; the making of cuttings, and the special requirements for propagating commercial fruits and ornamental plants. Text: Bailey's *Nursery Manual.*

Laboratory.—Practical work is given in the preparation of seeds and in seed testing; in the preparation of seed beds, and in the use of seeding machinery; in transplanting, grafting, budding, and in general nursery practice.

105. SYSTEMATIC POMOLOGY. Elective, first semester. Class work, two hours; laboratory, six hours. Four semester credits. Prerequisite: Hort. 107. Professor Barnett.

This course consists of a technical study of fruit varieties, including varietal relationships, and the principles underlying pomological nomenclature, variety description, and both artificial and natural systems of variety classifications. Texts: Waugh's *Systematic Pomology* and Beach's *Apples of New York.*

Laboratory.—In the laboratory actual fruits are studied. These are obtained from many parts of the United States and make possible valuable comparisons of varietal variations due to environment. Description, identification, and the preparation of fruit displays are the principal laboratory topics.

107. ORCHARDING. Sophomore year, second semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Hort. 101. Professor Barnett and Assistant Professor Pickett.

This course includes studies of the conditions necessary for success with orchards, including location, improvement of soil, application of fertilizers and cultural methods, and pruning. Orchard pests, handling the fruit from the tree to the car, and storage of fruit are briefly considered.

Laboratory.—In the laboratory the student first of all gains acquaintance with all the more common fruit plants and their habit of fruit bearing. Pruning for tree building and for fruit production, the spraying program, fruit-tree judging, observation of cover crops, and apple-fruit descriptions are among the other practical phases of orcharding in which the student gains experience.

108. ELEMENTS OF HORTICULTURE. Sophomore year, second semester and summer school. (Required of the class of 1926.) Class work, three hours; laboratory, three hours. Four semester credits. Prerequisite: Bot. 105. Professor Barnett and Assistant Professor Pickett.

The relation of the more important subdivisions of horticulture to general agriculture and to advanced courses in pomology and olericulture is presented in this course. Principles such as propagation, pollination, and the relation of plant physiology to pruning are emphasized, but attention is also given to the applied phases of the subject.

Laboratory.—The greater part of the laboratory work is done in the College orchards and gardens. Fruit-bearing habits, propagation, pruning, spraying, transplanting, cover crops, and fruit varieties are among the important topics studied.

110. SMALL FRUITS. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Hort. 101. Professor Barnett.

The small fruits of commercial importance are considered with reference to their requirements as to soil, fertilizers, cultivation, and protection. The management of small areas designed to furnish a supply of fruits for home use, and the handling of commercial plantations, are considered. Text: Sears' *Productive Small Fruit Culture.*

113. FARM FORESTRY. Elective, first semester. Class work, three hours; laboratory, three hours. Four semester credits. Professor Dickens.

This course consists of a study of the needs of Kansas farms for windbreaks and wood lots for post and fuel production; also a study of forest conservation and methods of handling timber. The growing of trees in locations better suited for timber than for other crops is considered; also the composition of windbreaks and their value as a protection to home orchards and fields.

Laboratory.—Laboratory work includes identification of species, methods of forming windbreaks, and nursery work in transplanting trees of various sizes and a determination of the rate of growth of trees under various conditions.

116. DENDROLOGY. Elective, second semester. Class work, one hour; laboratory, six hours. Three semester credits. Professor Dickens.

In this course a study is made of the classification and identification of forest trees, including a study of forest ecology and taxonomy; of the classification of commercial species; the relative importance of timber species; and the life history and requirements of trees.

Laboratory.—The laboratory work consists of studies in the College arboretum and excursions to near-by wood lots. The student is given an opportunity to become acquainted with trees that succeed well in this state.

119. SILVICULTURE. Elective, second semester. Class work, two hours; field work, three hours. Three semester credits. Prerequisite: Hort. 113 or 116. Professor Dickens.

The business of tree growing for timber and economic purposes is studied. Requirements of species, their range and requirements as to soils, climate and the various factors that determine their reproduction and rate of growth are discussed. Protection of forests from fire and insects and the application of various systems of silviculture are given consideration.

122. GARDENING. Sophomore year, second semester. Class work, three hours. Three semester credits. Professor Dickens and Assistant Professor Wiedorn.

It is the purpose of this course in gardening to give young women a working knowledge of and a close acquaintance with the garden as it concerns the home. The first part of the course is concerned with the principles of plant growth, the relation of soils to plants, and the methods necessary for successful work in kitchen gardening, flower beds, window gardening, the requirements of plants in regard to watering, temperatures, hotbeds and the first principles of floriculture.

In the latter part of the course the young women are introduced to the principles of landscape gardening, with particular reference to the problems of home plantings. In conjunction with the lectures, each member of the class is required to prepare plans for town home, farm home and country place, and the classes are required to do group work that will give them an insight into the needs of school grounds. Playgrounds, public parks, and cemeteries are considered and are given a considerable amount of time.

Particular emphasis is placed upon acquaintance with materials that are used for garden purposes. The College campus, gardens, and greenhouses furnish a wealth of material that is adapted to garden problems and landscape composition.

126. LANDSCAPE GARDENING I (*or* ELEMENTARY LANDSCAPE DESIGN). Elective, second semester and summer school. Class work, one hour; laboratory, three hours. Two semester credits. Assistant Professor Wiedorn.

This is a general course. It is designed to give some knowledge of the variety of problems to be met in the practice of landscape gardening.

Laboratory.—The laboratory work consists of drafting-room work and field trips. A series of problems is given, from the simple arrangement of home grounds to the layout of a country estate or park. Detailed study of selected designs of the leading landscape architects will be made. Special stress will be laid on graphic expression and methods of indication.

128. GREENHOUSE CONSTRUCTION AND MANAGEMENT. Elective, first semester. Class work, three hours. Three semester credits. Mr. Balch.

This course consists of work covering the more important points of greenhouse construction and the proper methods of conducting the greenhouse business. Not only is this subject treated from the commercial standpoint, but the management of private conservatories is also carefully studied.

131. HOME AND SCHOOL GARDENING. Elective, second semester and summer school. Class work, two hours; laboratory, three hours. Three semester credits. Mr. Balch.

The object of this course is to impart a knowledge of the principles which underlie success in gardening and the adaptation of small areas to the production of vegetables and flowers. The subjects of soil preparation, seed selection, fertilizers, hotbeds, plant manipulation, and the planning of the garden are given special consideration. Opportunity is given for teachers to become familiar with general garden methods and the use and manipulation of garden tools, including seeders, weeders, and wheel hoes. Allotments of ground areas required for different crops, the length of time required to mature various vegetable and flower crops, the adaptation of these to country and city schools, and suggestions for marketing, are among the subjects considered.

FOR GRADUATES AND UNDERGRADUATES

201. PRACTICAL POMOLOGY. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Hort. 104. Professor Barnett and Assistant Professor Pickett.

The class work in this course is given by means of lectures and library assignments. It treats of certain practical phases of orcharding which are not given due weight in even the most recent textbooks. These are: Fruit geography, harvesting, grading and packing, storage houses and their management, marketing, and the production of manufactured fruit products.

Laboratory.—The laboratory work consists of field work in the harvesting, grading, and packing of fruits. Several types of sizing machines are used

for demonstrations. Intensive work is given in packing of the various kinds of fruits in boxes and barrels. A thorough study is made of storage practice.

202. SUBTROPICAL POMOLOGY. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: Hort. 104. Professor Barnett.

This course is designed to acquaint students of pomology with the geography and methods of production of the principal subtropical fruits which are grown in the United States. The first half of the semester is devoted to the citrus group, and Coit's *Citrus Fruits* is used as a text. Other important fruits, as the fig, the olive, the date, the avocado, the loquat, etc., are studied by means of lectures and assigned readings during the second half of the semester.

205. ADVANCED POMOLOGY. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Hort. 104. Professor Barnett.

The class work in advanced pomology takes up each of the important deciduous tree fruits and considers those points in which its characteristics and production set it apart from the other species. Included are such studies as the taxonomy, morphology, history, statistics of production, climatic range and limits, varietal adaptations, quality and its determining factors, and irrigation of the kinds of fruits under consideration. Lectures and recent bulletins supply the material.

Laboratory.—Advanced apple judging, description and identification of the trees of named varieties, preparation of production graphs, and fruit storage studies are typical of the laboratory work in this course.

208. SPRAYING. Elective, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Chem. 102. Assistant Professor Pickett.

The class work consists of lectures on spraying machinery, accessories, and the principal materials used as insecticides and fungicides.

Laboratory.—The laboratory work offers practice in the preparation and testing of spray materials. Special study is given to the construction of the various types of spray machinery. Nozzles and spray guns are carefully tested.

209. ORCHARD PROBLEMS. Credit determined by instructor. Prerequisite: Hort. 105. Open to seniors and graduate students only. Professor Dickens.

An opportunity is given students in this course to do investigative work on problems relating to commercial orcharding. Orchard surveys, production costs, root-stock adaptations, pruning tests, and studies of fruits in common storage are specific examples. The course is elastic and may extend over the full year. Some extra expense incident to visiting other sections of the state or for the purchase of materials may be required of the student.

210. MARKET GARDENING. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Mr. Balch.

This course is made as practical as possible. In the classroom the lecture work is reinforced with problems concerning the business end of market gardening. The students are required to prepare seed orders and estimate the cost per acre of growing various garden crops. Particular stress is laid upon the harvesting, storing, and marketing of vegetables.

Laboratory.—The laboratory work is given in the College gardens. Each student is assigned a plot of ground to plant and care for during the semester. Careful records are kept of cultural operations and the yields. Disease and insect control are studied in a practical way.

218. MARKET GARDENING PROBLEMS. Credit determined by instructor. Mr. Balch.

This course includes a study of the important methods of production of standard vegetables of both garden and greenhouse. Special attention is given to the problems of marketing, including organization and formation of

first-hand markets in cities by express and parcel-post shipments and the possibilities of improving storage and shipping facilities in order to prolong the period of salable condition.

221. FORCING FLOWERS AND VEGETABLES. Credit determined by instructor. Mr. Balch.

The propagation and cultural method, soil studies, ventilation, heating, watering, and the control of greenhouse pests are among the problems studied.

222. HISTORY AND LITERATURE OF LANDSCAPE GARDENING. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: Hort. 125. Assistant Professor Wiedorn.

This course consists of a study of the history and literature of landscape gardening with special reference to the early influences as they govern modern design.

223. CIVIC ART. Elective, first and second semesters. Class work, three hours. Three semester credits. Prerequisite: Hort. 222. Assistant Professor Wiedorn.

This is a general course. The subjects considered are city layout, civic centers, parks and park systems, playgrounds, streets and boulevards, city nuisances, civic improvement societies, etc. Some of the lectures are illustrated by slides and special emphasis is placed upon the problems of the smaller cities.

225. PLANT MATERIALS IN LANDSCAPE GARDENING. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Hort. 101. Assistant Professor Wiedorn.

A thorough study is made of the hardiness, form, color, habits, and adaptations of trees, both deciduous and evergreen, shrubs, hardy perennials, biennials, and annuals with view to giving the student a working knowledge of the materials essential to formulate a working landscape plan.

233. TREE SURGERY. Elective, second semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Bot. 208. Assistant Professor Wiedorn.

This course consists of a study and practice of the most approved methods of caring for ornamental trees and the technical details of planting, pruning and spraying, bolting, chaining, and cavity work. Shade tree legislation and the duties of shade-tree commissions and tree wardens are discussed.

235. HORTICULTURE SEMINAR. Elective, first semester. Class work, one hour. One semester credit. Prerequisites: Hort. 105 and 107. Professor Dickens and Professor Barnett.

The work in this course includes a study and critical discussion of recent horticultural publications and of experimental and research projects now under study in this and other agricultural experiment stations.

238. LANDSCAPE GARDENING II. Elective, second semester. Laboratory, nine hours. Three semester credits. Assistant Professor Wiedorn.

A series of advanced problems, continuing course 125, from topographic surveys is offered by large areas, as parks, playgrounds, and country estates. Section profiles and perspectives will be made. Materials of construction will be discussed. Special emphasis is laid upon engineering work.

FOR GRADUATES.

303. THE THEORY AND ÆSTHETICS OF LANDSCAPE GARDENING. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Hort. 222. Assistant Professor Wiedorn.

A careful study is made of the underlying principles of landscape art and design. This course is primarily intended for students who wish to specialize in landscape work, but will be of interest to all those who intend to teach.

307. LANDSCAPE GARDENING III (*or* PLANTING DESIGN). Elective, second semester and summer school. Class work, one hour; laboratory, three hours.

Two semester credits. Prerequisites: Hort. 225 and 238. Assistant Professor Wiedorn.

This course consists of a study of the hardiness, use, adaptation, arrangement, and æsthetic composition of trees, shrubs, vines, and flowers with reference to problems of landscape design; also the preparation of nursery lists and estimates of cost.

315. POMOLOGICAL RESEARCH. Credit determined by instructor. Prerequisites: Hort. 105 and such other courses as the problem undertaken may require. Professor Barnett.

Graduate students will be permitted to select any special problem that will have a direct bearing on the promotion of the fruit industry. Fruit-bud formation, soil adaptation of varieties, and the effects of fertilizers are a few of the problems that offer splendid opportunities for graduate study. Data collected in this course may form the basis for a master's thesis.

Milling Industry

Professor FITZ
Assistant Professor MANN
Miller OAKES

The Department of Milling Industry was established primarily to undertake investigations in the handling, marketing and milling of wheat. Every student of agriculture should have some knowledge of this subject, and also of the handling of grain products other than those obtained from wheat. A full and complete knowledge of the needs of grain growing as an industry must necessarily include the utilization of grain in the manufacture of food, together with the natural by-products resulting therefrom.

The department has a well-equipped plant, consisting of six double-stand 7″ x 14″ rolls, with necessary cleaning machinery and dust collectors, sifters, and purifiers. The results secured here are comparable with those from a regular commercial mill. A baking laboratory equipped with proofing closet, dough mixer, and electric ovens is open for student use, as is also a laboratory for chemical tests on wheat and flour.

COURSES IN MILLING INDUSTRY

FOR UNDERGRADUATES

101. PRINCIPLES OF MILLING. Sophomore year and elective, both semesters. Laboratory, three hours. One semester credit. Miller Oakes.

This course includes a study of the theory and practice of milling with demonstrations on a small experimental mill.

102. GRAIN MARKETING. Junior year and elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Agron. 101. Professor Fitz.

This course includes a study of methods of handling, storing, marketing and grading of grain; the history of the origin and development of grain inspection and grades; a study of commercial grain grades and government standards; the classification and organization of inspection systems; the organization and functions of grain exchanges or boards of trade; and principal grain markets, with receipts, shipments, and consumption.

103. GRAIN PRODUCTS. Junior year and elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Mil. Ind. 102. Professor Fitz.

A brief study of the methods of manufacturing food products from cereals, with the resulting by-products, and a comparison of composition and feeding value of these by-products are included in this course.

109. MILLING PRACTICE I. Junior year and elective, both semesters. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Mill. Ind. 101. Miller Oakes.

This course consists of practice in the art of milling, with demonstrations on a model mill.

110. MILLING PRACTICE II. Senior year and elective, both semesters. Laboratory, six hours. Two semester credits. Prerequisite: Mill. Ind. 109. Miller Oakes.

This course is a continuation of Milling Practice I.

FOR GRADUATES AND UNDERGRADUATES

203. WHEAT AND FLOUR TESTING. Senior year and elective, first semester. Class work, one hour; laboratory, nine hours. Four semester credits. Prerequisite: Mill. Ind. 103, Chem. 120, and 260. Assistant Professor Mann.

This course includes special quantitative tests applied to cereals and their by-products; methods of analysis and interpretation of results.

204. EXPERIMENTAL BAKING A. Senior year and elective, second semester. Laboratory, six hours. Two semester credits. Prerequisite: Mill. Ind. 203. Assistant Professor Mann.

This course includes practice in baking tests; comparison of methods, formulas, and flour; and interpretation of results.

205. EXPERIMENTAL BAKING H. Elective, second semester. Laboratory, six hours. Two semester credits. Prerequisite: Food and Nut. 106. Assistant Professor Mann.

This course includes demonstration in milling and practice in bread making; comparison of methods, yeasts and flours, and a study of the more important conditions which influence the quality of bread.

Poultry Husbandry

Professor LIPPINCOTT
Associate Professor PAYNE
Instructor STEUP
Superintendent MUGGLESTONE

The poultry plant, occupying twelve acres and situated just north of the northeast corner of the College campus, is devoted to the breeding and rearing of the stock used for class and experimental work. It is equipped with various types of houses, runs, incubators, and brooders, and with flocks of the leading breeds of fowls.

There is in the government and state experiment stations and in schools and colleges an increasing demand for men with experience and systematic training in handling poultry. There is likewise a growing demand for men to enter poultry-packing houses and for men capable of managing poultry-farming enterprises of considerable proportions.

COURSES IN POULTRY HUSBANDRY

FOR UNDERGRADUATES

101. FARM POULTRY PRODUCTION. Sophomore and junior years, both semesters and summer school. Class work, one hour; laboratory, three hours. Two semester credits. Professor Lippincott and Associate Professor Payne.

This course takes up the problems of poultry management on the general farm.

102. HOME POULTRYING. Elective, second semester. Open to women only. Class work, three hours for the first half of the semester. One and one-half semester credits. Professor Lippincott and Associate Professor Payne.

This course takes up the problems of poultry management for egg and meat production. It is given with the elective course, Dairy Husb. 112, the second half of the semester.

104. PRACTICE IN POULTRY FEEDING. Elective, second semester. Three times a day, seven days a week, for a period of three weeks, at hours outside of the regular schedule. One semester credit. Prerequisite: Poult. Husb. 101. Associate Professor Payne.

This course consists of the actual care of a flock of fowls by the student under the supervision of an instructor. Careful records are kept of the feeds consumed and the eggs produced, and a survey is made of the recent literature on poultry feeding.

110A. POULTRY BREEDS AND TYPES. Elective, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Associate Professor Payne.

In this course a historical study is made of the various breeds commonly found on the Kansas farm. Particular attention is paid to tracing the evolution of the present types. The laboratory is given over largely to judging the different breeds and varieties, both by score card and by comparison.

112A. MARKET POULTRY AND EGGS. Elective, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Poult. Husb. 101. Associate Professor Payne.

In this course the lectures cover the methods of handling market poultry, alive and dressed. For three hours of laboratory work, practice is given in candling and grading eggs, caponizing, killing, cooling, grading and packing poultry for market. The student will also crate-feed three lots of chickens for a period of two weeks.

113. ARTIFICIAL INCUBATION AND BROODING. Elective, second semester. Three times a day, seven days a week for a period of not less than eight weeks at hours outside the regular schedule. Two to four semester credits. Prerequisite: Poult. Husb. 101. Associate Professor Payne.

This course consists of a survey of the literature upon incubation and brooding, the care of an incubator by the student throughout the incubation period, bringing off the hatch, and caring for the chicks in a brooder for four weeks.

FOR GRADUATES AND UNDERGRADUATES

202. POULTRY BREEDING. Elective, second semester. Conferences and laboratory, six hours. Two semester credits. Prerequisite: An. Husb. 221. Professor Lippincott.

The experimental work on inheritance in poultry is reviewed by means of lectures and assigned readings.

POULTRY FARM ORGANIZATION. See Ag. Ec. 206.

POULTRY BACTERIOLOGY. See Bact. 216.

POULTRY ANATOMY. See Anat. 210.

206. POULTRY PROBLEMS. Elective, both semesters and summer school. Credit as arranged. Prerequisites: Poult. Husb. 101, 104, 105, and 107, and such other courses as the problem undertaken may require. Professor Lippincott and Associate Professor Payne.

In this course the student pursues a definite investigation concerning some phase of poultry work. Arrangements must be made to continue this work through more than one semester when the problem attacked cannot be solved within the limits of a single semester.

FOR GRADUATES

301. POULTRY RESEARCH. Elective, both semesters and summer school. Credit as arranged. Prerequisites: Poult. Husb. 101, 104, 105, 107, and such other courses as the problem undertaken may require. Professor Lippincott.

In this course a definite line of investigation is followed which may form the basis of a thesis presented in partial fulfillment of the requirements for the degree of Master of Science.

Agriculture in the Summer School

Teachers of the high schools and grade schools of Kansas are beginning to appreciate the value of the work offered in the Summer School of the Kansas State Agricultural College. Besides first-class professional courses and other regular standard courses of college grade, courses in agriculture and agricultural engineering furnish unusual opportunities to teachers preparing for larger usefulness in Kansas communities. Some of the agricultural courses offered in the Summer School that will interest teachers are: soils, farm crops, grain grading and judging, seed identification and weed control, genetics, judging market live stock, judging breeding live stock, principles of feeding, elements of dairying, dairy judging, farm poultry production, horticulture, home and market gardening, orcharding, and landscape gardening. Other advanced courses in agriculture will be added to meet the demand, while the preparation of Smith-Hughes teachers and others for the proper teaching of farm shop work is amply provided for in courses in agricultural engineering and manual training and shop practice. Some of the fundamental courses offered in these lines are: farm buildings, farm motors, farm machinery, forging, woodworking for grades and high schools, and farm shop practice.

Brief information regarding many of these courses in the Summer School may be found in the department descriptions in this catalogue. For further information write to THE VICE PRESIDENT, KANSAS STATE AGRICULTURAL COLLEGE, MANHATTAN, KAN.

Special Courses in Agriculture

The Farmers' Short Course, the Commercial Creamery Short Course, the Cream Station Operators' Short Course, the Short Course in Wheat and Flour Testing, the Short Course for Dairy Herdsmen, and the Beef Cattle Herdsman's Short Course are grouped with other special courses in another part of the catalogue, and are there described. They may be found by reference to the general index in the back of this book.

The Division of Veterinary Medicine

RALPH RALPH DYKSTRA, *Dean*

The College has one of the best-equipped schools of veterinary medicine in the West. It is rated in class "A" by the United States Department of Agriculture, which rating places it among the best in the United States and Canada. In addition to giving the student the best possible technical training in veterinary medicine, the course is designed to give the broad culture necessary for men who are to take their places in public affairs. Professional men, such as veterinarians, are placed in a more or less public relation to the communities they serve. They must have a broad groundwork in cultural and ethical training, which will win them the confidence and respect of their communities. Success is measured in something more than dollars and cents, and the man whose view of life is no broader than his profession adds but little to the world and its happiness. The training given by the College in veterinary science seeks to emphasize the value of the man as a man, as much as his value as a specialist.

The Division of Veterinary Medicine gives most of the technical work in the curriculum in veterinary medicine, a general description of which is given below. The division is housed in the Veterinary Building, which was erected at a cost of over $60,000, and is thoroughly equipped throughout. It contains modern classrooms, and its laboratories possess the necessary appliances for illustrating the several subjects required. The mode of instruction is more specifically detailed in succeeding sections.

The policy adhered to in the instruction in all the departments is that the science of veterinary medicine is the foundation, and the art merely supplementary. A thorough drill is given in the foundation studies, and later in the curriculum practical application of these is made in actual field work. This result is a thoroughly scientific veterinary education.

In the arrangement of the schedule of the veterinary curriculum it is implied that the courses should be followed in regular sequence, as each year's work depends upon the work done the previous year. Certain courses, however, may be selected as electives if a student has the necessary prerequisites. These courses are mentioned in the list of electives.

THE CURRICULUM IN VETERINARY MEDICINE

Veterinary medicine has made remarkable advances within recent years, and is taking its place alongside human medicine as a science. In truth, medical science and veterinary science are but specialized branches of the same science, and must be developed together. The modern veterinarian takes his place in the community as a professional man of education and culture. With the general improvement of the live stock on the farms, and with the advance of live stock in value, there is constant increase in the demand for skilled physicians to care for them.

The veterinarian, while primarily trained to conserve the health of farm animals, has a yet larger service to render in preventing diseases common to both man and beast from being communicated from domestic animals to man. Moreover, he must see that the animals slaughtered for meat are healthy and that the products are handled under such conditions as to render them suitable for human food. The public is now demanding that milk and other food products be free from contamination and that they be incapable of transmitting dangerous diseases, like tuberculosis, typhoid fever, scarlet fever, and diphtheria. There is ample work for all of the thoroughly competent veterinarians that the colleges of the country will train.

The curriculum in veterinary medicine at the Agricultural College was established to give the young men of this state an opportunity to pursue these studies in an agricultural environment, where the facilities offered by other branches of the College would be at their command. While the instruction in this curriculum is largely technical, enough subjects of a general character are included to give a sound education and a broad outlook. Better to fit the veterinarian to deal wisely with the live-stock problems which he has to meet, he is required to take the work in live-stock feeding, breeding and judging, and in milk inspection, zoölogy, and embryology, in addition to his purely professional work.

The diploma from this school is recognized by the United States Department of Agriculture, by the United States Civil Service Commission, by the American Veterinary Medical Association, and by the various examining boards of the several states and territories of America where it has been presented.

THE CURRICULUM IN ANIMAL HUSBANDRY AND VETERINARY MEDICINE

The combined curriculum in animal husbandry and veterinary medicine has been outlined so that students may receive the degree of Bachelor of Science at the end of four years, and the degree of Doctor of Veterinary Medicine at the end of two years more, thus securing both degrees in six years.

Curriculum in Veterinary Medicine

The Arabic numeral immediately following the name of a subject indicates the number of semester credits, while the numbers within the parentheses indicate the number of clock hours a week of recitation and of laboratory, respectively. One credit a semester is allowed for the courses in clinics.

FRESHMAN

First Semester		Second Semester	
Anatomy I		Anatomy II	
Anat. and Physiol. 102	4(2-6)	Anat. and Physiol. 107	9(4-15)
Histology I		Histology II	
Path. 101	3(1-6)	Path. 106	3(1-6)
Chemistry V-I		Organic Chemistry (Vet.)	
Chem. 105	5(3-6)	Chem. 106	5(3-6)
Embryology and Physiology (Vet.)			
Zoöl. 109	5(3-6)		
Military Science (Vet.) I		Military Science (Vet.) II	
Mil. Tr. 121	1(0-3)	Mil. Tr. 122	1(0-3)
Physical Education M-I		Physical Education M-II	
Phys. Ed. 103	R(0-2)	Phys. Ed. 104	R(0-2)

SOPHOMORE

First Semester		Second Semester	
Anatomy III		Anatomy IV	
Anat. and Physiol. 111	5(1-12)	Anat. and Physiol. 116	3(1-6)
Comparative Physiology I		Comparative Physiology II	
Anat. and Physiol. 121	5(4-3)	Anat. and Physiol. 126	3(2-3)
Medical Botany		Pathogenic Bacteriology I	
Bot. 126	2(1-3)	Bact. 111	4(2-6)
College Rhetoric I		Pathology I	
Engl. 101	3(3-0)	Path. 202	3(2-3)
Judging Live Stock (Vet.)		Principles of Feeding	
An. Husb. 135	3(1-6)	An. Husb. 152	3(3-0)
		Genetics	
		An. Husb. 221	3(3-0)
Military Science (Vet.) III		Military Science (Vet.) IV	
Mil. Tr. 123	1(0-3)	Mil. Tr. 124	1(0-3)
Physical Education M-III		Physical Education M-IV	
Phys. Ed. 105	R(0-2)	Phys. Ed. 106	R(0-2)

JUNIOR

First Semester

Surgery I
Surg. and Med. 101..... 3(3-0)
Diagnosis
Surg. and Med. 170..... 2(2-0)
Farm Poultry Production
Poult. Husb. 101 ..... 2(1-3)
Materia Medica
Surg. and Med. 157..... 4(4-0)
Pharmacy
Surg. and Med. 166 ..... 1(0-3)
Pathology II
Path. 207 ..... 3(2-3)
Pathogenic Bacteriology II
Bact. 116 ..... 4(2-6)
Clinics I
Surg. and Med. 137..... 1(0-9)

Second Semester

Surgery II
Surg. and Med. 106 ..... 3(3-0)
Diseases of Large Animals I
Surg. and Med. 174..... 4(4-0)
Horseshoeing
Surg. and Med. 126..... 1(1-0)
Therapeutics
Surg. and Med. 162..... 4(3-3)
Pathology III
Path. 212 ..... 5(4-3)
Clinics II
Surg. and Med. 140..... 1(0-9)

SENIOR

First Semester

Surgery III
Surg. and Med. 111..... 3(3-0)
Diseases of Large Animals II
Surg. and Med. 177..... 5(5-0)
Poultry Diseases
Bact. 217 ..... 2(2-0)
Pathology IV
Path. 214 ..... 3(2-3)
Meat Inspection
Path. 216 ..... 2(2-0)
Parasitology
Zoöl. 124 ..... 3(2-3)
Clinics III
Surg. and Med. 143 ..... 1(0-12)

Second Semester

Surgery IV
Surg. and Med. 116..... 3(3-0)
Infectious Diseases of Large Animals
Surg. and Med. 181..... 5(5-0)
Diseases of Small Animals
Surg. and Med. 186..... 2(2-0)
Ophthalmology
Surg. and Med. 183..... 1(1-0)
Operative Surgery
Surg. and Med. 121..... 1(0-3)
Jurisprudence
Anat. and Physiol. 161.... 1(1-0)
Obstetrics
Surg. and Med. 131..... 3(3-0)
Dairy Inspection II
Dairy Husb. 118..... 1(0-3)
Clinics IV
Surg. and Med. 146..... 1(0-12)

ELECTIVES

First Semester

Surgical Anatomy
Anat. and Physiol. 206..... 1(0-3)
Vaccine Manufacture I
Path. 227 ..... 2(0-6)

Second Semester

Special Histology
Path. 225 ..... 3(1-6)
Vaccine Manufacture II
Path. 230 ..... 2(0-6)

First or Second Semester

Pathological Technic and Diagnosis I
Path. 220 ..... 2(0-6)
Pathological Technic and Diagnosis II
Path. 221 ..... 4(0-12)
Research in Pathology
Path. 302 ..... 3 to 5(-)
Special Anatomy
Anat. and Physiol. 201..... 4(1-9)
Problems in Physiology
Anat. and Physiol. 215.... 3 to 5(-)

Curriculum in Animal Husbandry and Veterinary Medicine[1]

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

Freshman year of the Curriculum in Agriculture

SOPHOMORE

First Semester		Second Semester	
Quantitative Analysis I Chem. 150	2(0-6)	Pathogenic Bacteriology I Bact. 111	4(2-6)
Organic Chemistry (Agr.) Chem. 120	3(2-3)	Anatomy II Anat. and Physiol. 107	9(4-15)
General Zoölogy Zoöl. 105	5(3-6)	Forage Crop Production Agron. 102	3(2-2, 1)
Anatomy I Anat. and Physiol. 102	4(2-6)	Agricultural Journalism Ind. Jour. 164	1(1-0)
Grain Crop Production Agron. 101	3(2-2, 1)		
Infantry I Mil. Tr. 103	1(0-4)	Infantry II Mil. Tr. 104	1(0-4)
Physical Education M-III Phys. Ed. 105	R(0-2)	Physical Education M-IV Phys. Ed. 106	R(0-2)

JUNIOR

First Semester		Second Semester	
Embryology Zoöl. 117	3(2-3)	Principles of Feeding An. Husb. 152	3(3-0)
Anatomy III Anat. and Physiol. 111	5(1-12)	Anatomy IV Anat. and Physiol. 116	3(1-6)
Histology I Path. 101	3(1-6)	Histology II Path. 106	3(1-6)
Genetics An. Husb. 221	3(3-0)	Electives[2]	7
Electives[2]	3		

SENIOR

First Semester		Second Semester	
General Entomology Ent. 101	3(2-3)	Agricultural Relationships[3] Gen. Agric. 201	1(1-0)
Comparative Physiology I Anat. and Physiol. 121	5(4-3)	Soil Fertility Agron. 132	3(2-2, 1)
Soils Agron. 131	4(3-3)	Comparative Physiology II Anat. and Physiol. 126	3(2-3)
Agricultural English[3] Engl. 137	3(3-0)	Pathology I Path. 202	3(2-3)
Electives[2]	1	Electives[2]	6

FIFTH YEAR

Junior Year of the Curriculum in Veterinary Medicine

SIXTH YEAR

Senior Year of the Curriculum in Veterinary Medicine

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[1] This curriculum is so arranged that students may receive the degree of Bachelor of Science (in agriculture) at the end of four years, and the degree of Doctor of Veterinary Medicine at the end of two more years.

[2] All electives must be officially approved before assignment by both the head of the Department of Animal Husbandry and the Dean of the Division of Agriculture.

[3] The courses in Agricultural English and Agricultural Relationships are open to seniors only.

Anatomy and Physiology

Professor BURT
Associate Professor MCLEOD

This branch of veterinary medicine extends over the freshman and sophomore years for veterinary students, and one semester is required in the curriculum in agriculture.

The classroom instruction consists of lectures, quizzes and recitations and special dissection of the part under discussion, also a study of dissected specimens, various models, and the Azoux model of the horse. Mounted skeletons and limbs, and loose bones are abundant in the museum. The horse is taken as a type and the other domestic animals are compared with the horse. As often as necessary parts of other animals are dissected to show the differences.

The subjects for dissection are preserved by the injection of a formalin solution followed by a starch solution colored red, which fills and hardens within the arteries. Each half of the subject is divided into three parts; namely, the head and neck, fore limb and thorax, hind limb and posterior half of body. The students work in pairs, each pair dissecting one part before passing on to another part. The work is so arranged that bones are first studied, then the muscles and joints. This is followed by the dissection of the circulatory and nervous systems. The viscera of certain regions are studied by the students at work on those respective parts, *i. e.*, the abdominal organs are studied by the students at work on the hind limb, etc.

The courses in anatomy require several lecture rooms, which contain models, skeletons, and bones of all kinds, and a thoroughly sanitary dissecting room equipped with all of the latest materials necessary to give a course in anatomy second to none on the continent.

The equipment for instruction in physiology is ample to give the student a thoroughly comprehensive course of laboratory study.

In addition to numerous atlases and charts furnished by the College, the student is required to have Sisson's *Veterinary Anatomy* as a textbook and Sisson's *Dissecting Guide* as a laboratory guide.

COURSES IN ANATOMY

FOR UNDERGRADUATES

102. ANATOMY I. Freshman year, first semester. Class work, two hours; laboratory, six hours. Four semester credits. Doctor McLeod.

This course consists of osteology, or the study of bones. The bones of the horse are studied in detail and a comparative study of the bones of other domestic animals and also of man, is made. Drawings of the bones are made by the student in order that he may obtain a better mental picture of their shape and characteristic parts. The bones of the head are studied separately and collectively. Careful attention is given to the location and extent of the sinuses of the head.

107. ANATOMY II. Freshman year, second semester. Class work, four hours; laboratory, fifteen hours. Nine semester credits. Prerequisite: Anatomy 102. Doctors Burt and McLeod.

This course consists of myology, arthrology and splanchnology, or a study of the muscles, joints and viscera. The student is required to make a careful dissection of the muscles of the body, learning their location and attachments, relations one to another as well as their relations to other important structures. After the muscles are dissected and learned the student dissects the ligaments of the joints. The student also studies the viscera of the respective part at the time of dissection of that part, *e. g.*, the student dissecting upon the fore limb and thorax will study the viscera of the thoracic cavity. Check cards and drawings indicating the different stages of dissection are kept, and the work checked at frequent intervals.

111. ANATOMY III. Sophomore year, first semester. Class work, one hour; dissection, twelve hours. Five semester credits. Prerequisite: Anat. 107. Doctor Burt.

This course and Anatomy IV consist of the study of angiology and neurology and all parts not previously dissected. Having had osteology and myology, the student is now prepared to get an accurate mental picture of the distribution, location and relation of the blood vessels and nerves. As in Anatomy II, the subject is divided into three parts. During this semester two parts will be dissected, leaving one part for Anatomy IV. Drawings are required as in Anatomy II.

116. ANATOMY IV. Sophomore year, second semester. Class work, one hour; dissecting, six hours. Three semester credits. Prerequisite: Anat. 111. Doctor Burt.

This course is a continuation of Anatomy III. The student will now complete the dissection of every part of the subject, including special parts, as the foot, brain, eye, etc. In addition to the completion of the dissection of the horse, a comparative study of the principal structural differences of the various domestic animals, not studied concurrently with the previous courses, will now be made.

FOR GRADUATES AND UNDERGRADUATES

201. SPECIAL ANATOMY. Elective, first or second semester. Class work, one hour; dissection, nine hours. Four semester credits. Prerequisite: Any of the courses in Anatomy: 102, 107, 111, 116, and 131, or their equivalent. Doctor Burt.

This course is adaptable to the requirements of the line of work in which the student is specializing. The work consists of the study of any part of the horse, as the digestive system, the genital system, etc., or may take up the study of similar parts of the ox, sheep, pig, etc. For any one so desiring, poultry anatomy may be chosen.

206. APPLIED ANATOMY. Elective, first semester. Laboratory, three hours. One semester credit. Prerequisite: Anatomy 116. Doctor Burt.

This course is a link that connects the other courses in anatomy with operative surgery. It consists of the dissection of certain areas embraced in performing the various surgical operations, and the study of all the structures in each area and their relation one to another as they would present themselves during an operation rather than the relation of any structure with the rest of the body.

COURSES IN PHYSIOLOGY

FOR UNDERGRADUATES

121. COMPARATIVE PHYSIOLOGY I. Sophomore year, first semester. Class work, four hours; laboratory, three hours. Five semester credits. Prerequisites: Anat. and Physiol. 102 and 107, and Chem. 106. Doctors Burt and McLeod.

This course treats of the physiology of domestic animals, beginning with the study of the blood, heart, blood vessels, and continuing with the ductless glands and internal secretions, respirations, digestion, and absorption. Textbook: *A Manual of Veterinary Physiology,* by Fred Smith.

Laboratory.—The laboratory work consists of a practical application of the knowledge derived in the classroom. The laboratory is equipped with all necessary material and apparatus, such as kymograph, manometers, tambours, inductoriums, signal magnets, and electric clocks, to make the work interesting and practical, as well as instructive. Many experiments are made by the students upon themselves, as well as upon the domestic animals. Graphic records are made by the students of the blood pressure, rate and amplitude of the pulse, and respiration; also the changes produced by stimulating certain nerves, exercise, changes in position, the action of certain drugs, etc. The time of coagulation of the blood of various species of animals and the con-

ditions that influence the rapidity of coagulation are considered. The secretion of the various digestive juices, the conditions that will influence the rate of their secretion and their actions are studied in detail. Laboratory directions are furnished the student. References: *Practical Physiology,* Pembry; Halliburton's *Essentials of Chemical Physiology; Manual of Physiology,* Stewart; *Urine of the Horse and Man,* Fish; and other standard textbooks on physiology.

126. COMPARATIVE PHYSIOLOGY II. Sophomore year, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Anat. and Physiol. 107 and Chem. 106. Doctors Burt and McLeod.

The work of this semester is a continuation of Anat. 121, and treats of the urine and urinary system, nutrition, animal heat, muscular and nervous systems, locomotion, generation and development, growth and decay. Textbook: Smith's *Manual of Veterinary Physiology.*

Laboratory.—The work done exemplifies the lectures given in the classroom. Graphic records are made of the normal muscle contraction, the changes brought about by fatigue, tetanus, variations in temperature, application of drugs, etc. The conductivity of the nerves, nerve blocking, the effects of anæsthetics upon the conductivity of the nerves, reflexes, and other phenomena relating to the nervous system are studied. The composition of the normal urine and the tests applicable for the detection of abnormal constituents in pathologic urine are carefully considered. Directions and references are the same as in the laboratory course in Comparative Physiology I.

FOR GRADUATES AND UNDERGRADUATES

215. PROBLEMS IN PHYSIOLOGY. Elective, both semesters. Three to five semester credits. Prerequisites: Anat. and Physiol. 121, 126, and 131, or their equivalent. Doctor Burt.

Individual investigational problems in the physiology of digestion, reproduction, endocrin glands, etc., are assigned.

COURSE IN ANATOMY AND PHYSIOLOGY

FOR UNDERGRADUATES

131. ANATOMY AND PHYSIOLOGY. Sophomore year, first semester. Lectures and recitations, two hours; laboratory, three hours. Three semester credits. Doctors Burt and McLeod.

This combined course is intended principally for students in agriculture, and treats chiefly of physiology of the domestic animals; however, sufficient anatomy is taught to enable the student to thoroughly comprehend the correlation between the two subjects, and the physiologic relations existing among the various organs of the body.

Special emphasis is placed on the physiology of digestion, absorption metabolism, and excretion, so that the student may have a good foundation to understand the principles of feeding, etc., but due consideration is paid to the functions of the circulatory, respiratory, and nervous systems, etc. Text: Smith's *Manual of Veterinary Physiology.*

COURSE IN JURISPRUDENCE

FOR UNDERGRADUATES

161. JURISPRUDENCE. Senior year, second semester. Class work, one hour. One semester credit. Doctor Burt.

This course deals with the veterinarian's legal responsibilities, with national and state live-stock laws, quarantine regulations, etc. Text: Hemenway's *Veterinary Law;* also appropriate rules and regulations issued by state and federal authorities.

Pathology

Professor LIENHARDT
Assistant Professor KITSELMAN
Instructor SHULER
Instructor SAWYER

The Department of Pathology presents courses in histology, pathology and meat inspection. The instruction is presented by lectures or recitations, laboratory periods, and demonstrations which are carried out by the use of the projectoscope, and by autopsies held.

The laboratory is fully equipped and entirely up to date. The equipment consists of microtomes, paraffin ovens, microphotographic and projection apparatus, centrifuge, shaking machine, sterilizers, etc. Each student is furnished a drawer, microscope, prepared slides for study, and all other essentials needed for study in the laboratory courses.

The department is also in possession of quite a complete pathological museum, which contains specimens of organs and tissues that show lesions typical of the various infections, and some noninfectious diseases. These specimens are used in the study of pathology, and together with the specimens sent in from over the state and fresh material from the immediate vicinity they furnish ample material for the courses in pathology.

The department library contains text and reference books on pathology and allied subjects, also the current files of the important technical periodicals relating to pathology. These books are at the constant disposal of the student for reference.

The course in meat inspection together with the allied subjects required for a degree in veterinary medicine make the student eligible to take the civil-service examination for meat inspection. In this course visits are made to packing plants in Topeka and Kansas City.

COURSES IN HISTOLOGY

FOR UNDERGRADUATES

101. HISTOLOGY I. Freshman year, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Doctors Lienhardt and Sawyer.

The first part of the semester is spent upon the care and manipulation of the microscope, in the use of which the student must become proficient. This is followed by a microscopical examination of cotton, woolen, silk and linen fibers, bubbles of air, and drops of oil, to enable the student to recognize these when they are accidentally mounted with tissue. The fundamental tissues are next studied: epithelial tissues with regard to form, structure, arrangement and location; connective tissues with regard to structure and location, including bone development and teeth and their development; muscular tissue, voluntary, involuntary, and cardiac; nerve tissue, the structures and forms of its cells, of medullated and nonmedullated nerve fibers; spinal cord; the blood vessels, heart, and lymphatic vessels. Blood corpuscles are studied with regard to size, shape, and structure, including each kind of white corpuscles. Also, the blood-forming organs, as bone-marrow, lymph glands, and spleen, are studied. The histology of the digestive tract is studied, including study of the mouth, the tongue, the taste buds, the parotid, the submaxillary and sublingual, the thyroid and thymus glands, and the œsophagus. In this semester the student studies and mounts sixty-five slides, some of which are teased, and many of which are sectioned in paraffin and celloidin. Textbook: *Histology,* by Stohr, or *Histology,* by Bailey.

106. HISTOLOGY II. Freshman year, second semester. Class work, one hour; laboratory, six hours. Three semester credits. Doctors Lienhardt and Sawyer.

In this semester the student takes up the study of the stomachs of the dog, the horse, and the ox; the small intestines—duodenum, jejunum, and ileum; the large intestines—cæcum, colon, rectum and anus; liver, the pancreas, the respiratory tract—nasal mucous membrane, larynx, trachea, bronchi and lungs;

the urinary organs—kidney, ureter, bladder, urethra; the male and female genital organs; the skin and its appendages; the suprarenal gland; the medulla; the cerebellum; the cerebrum; the eye; and the ear. During this semester the student stains, mounts, studies with microscope and makes drawings of the above-mentioned tissues. Some of the tissues studied are injected with gelatin mass to bring out the blood vessels. Textbook: *Histology,* by Stohr, or *Histology,* by Bailey.

FOR GRADUATES AND UNDERGRADUATES

255. SPECIAL HISTOLOGY. Elective, second semester. Class work, one hour; laboratory, six hours. Three semester credits. Doctor Lienhardt.

This course is arranged to meet the requirements of those who are desirous of taking a histology course dealing with specific organs, as those concerned with digestion, respiration, etc. Tissues are fixed, dehydrated, imbedded, sectioned, stained, and mounted, and are studied after being properly prepared.

COURSES IN PATHOLOGY

FOR GRADUATES AND UNDERGRADUATES

202. PATHOLOGY I. Sophomore year, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Path. 106 and Anat. and Physiol. 126. Doctors Lienhardt and Sawyer.

The course in general pathology extends over two semesters and treats of the history of pathology, predisposition, immunity, congenital and inherited disease, cause of disease, course and termination of disease. Text: *Comparative General Pathology,* by Kitt.

207. PATHOLOGY II. Junior year, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Path. 106 and 202, Anat. and Physiol. 126, and Bact. 111. Doctors Lienhardt and Sawyer.

This course is a continuation of Pathology 202 and treats of circulatory disturbances, cardiac difficulties, hyperæmia, hemorrhage, dropsy, œdema, thrombosis, embolism, and alteration of the blood; disturbances in metabolism, fever, necrosis, atrophy, cloudy swelling, fatty changes, inflammation, calcification and concrement formation; and processes of repair, tumors, and functional disturbances. Text: *Comparative General Pathology,* by Kitt.

212. PATHOLOGY III. Junior year, second semester. Class work, four hours; laboratory, three hours. Five semester credits. Doctors Lienhardt and Sawyer.

This course is devoted to special pathology and pathological technic; collecting, fixing, hardening, embedding in celloidin and paraffin, sections of fresh, frozen, and embedded tissues; and a study of the method of preserving gross specimens. Considerable time is devoted to a consideration of stains and the method of staining. This work is followed by special pathology, which includes the macroscopic and microscopic examination of the following tissues in many of the pathological conditions to which they are subject: cardiac muscle, skeletal muscle, the liver, the kidney, the bladder, the pancreas, the lungs, the digestive tract, the serous membranes, the vascular system, the lymph nodes, the spleen, bone, skin, and genital organs. The students study and make drawings of the above-mentioned tissues. Textbooks: *Pathology,* by Delafield and Prudden; *Pathologische Anatomie,* by Kitt; and *Pathology,* vol. 11, by Adami and Nichols.

214. PATHOLOGY IV. Senior year, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Doctors Lienhardt and Sawyer.

This course is devoted to the pathology of the infectious diseases and to laboratory diagnosis. Post-mortem examinations are made on all animals dying in the hospital, at the College barns and in the neighborhood. The students attend and take turns in holding the autopsy. Each student is expected to

keep a written record of the pathological changes, also of the microscopic findings. The above work is done under the direction of the pathologist in charge. Text: *Pathology of Infectious Diseases,* by Moore.

216. MEAT INSPECTION. Senior year, first semester. Class work, two hours. Two semester credits. Doctor Lienhardt.

The course in meat inspection is designed to prepare men for national, state, and local sanitary work, which is being more strongly urged and demanded every day. The kinds and classes of stock, the traffic and transportation of animals, their inspection before death, their slaughter, the normal conditions of healthy animals, the diseases discernible at the time of slaughter, the disposition of the condemned from economic, hygienic and sanitary standpoints, and different preparations and methods of preservation, adulterations, sanitary laws and regulations, and other points bearing upon the question of healthful meat production, are considered. Visits are made to the local slaughtering establishments, and to the large packing plants in Topeka, Kansas City, or Wichita. Text: Edelman's *Meat Hygiene,* translated by Mohler and Eichorn.

220. PATHOLOGICAL TECHNIC AND DIAGNOSIS I. Elective, first and second semesters. Laboratory, six hours. Two semester credits. Prerequisite: Path. 212. Doctors Lienhardt and Sawyer.

This course consists of practice in post-mortem and laboratory diagnosis. The various methods of embedding and staining tissues are carried out upon the large collection of material which the laboratory contains, as well as the material which is constantly coming into the laboratory from various parts of the state.

221. PATHOLOGICAL TECHNIC AND DIAGNOSIS II. Elective, first and second semesters. Laboratory, twelve hours. Four semester credits. Doctors Lienhardt and Sawyer.

This course is a continuation of Path. 220.

227. VACCINE MANUFACTURE I. Elective, first semester. Laboratory, six hours. Two semester credits. Doctor Scott.

Vaccine Manufacture I comprises a study of the theory and practice of the manufacture of anti-hog-cholera serum and virus and the theory and practice of hog-cholera immunization. During this semester the student becomes familiar with and learns the practical use of all of the apparatus pertinent to the manufacture of anti-hog-cholera serum and virus.

230. VACCINE MANUFACTURE II. Elective, second semester. Laboratory, six hours. Two semester credits. Doctor Scott.

This course in vaccine manufacture is confined to the theory and practice of the manufacture of the various products which are used as immunologic agents in the control of blackleg, with special emphasis on the manufacture of filtrate and aggressin. This course also includes the application of tests for potency and sterility of the finished product and the isolation and identification of blackleg organisms from suspected specimens.

FOR UNDERGRADUATES

302. RESEARCH IN PATHOLOGY. Elective, both semesters. Three to five semester credits. Prerequisites: Path. 101, 106, 202, 207, 212, and 220, and Chem. 235, or their equivalent. Doctor Leinhardt.

This course includes individual research problems in pathology of the nervous system, eye and ear; also investigational work on disease caused by a filterable virus. The course is available as a master's thesis course.

Surgery and Medicine

Professor DYKSTRA
Professor MULDOON
Associate Professor MCLEOD
Associate Professor FRICK
Instructor SHULER

For instruction in surgery and clinic the equipment is excellent. The surgical amphitheater is an annex to the main Veterinary Building, seating over three hundred people, and equipped with every modern appliance for performing before the classes the most delicate operations upon both large and small animals. The hospital has a capacity of about thirty animals and is nearly always filled with patients, which give ample material for study of internal medicine as well. The out-clinic furnishes many cases yearly, giving the student opportunity to become familiar with the diseases and their treatment under the guidance of proficient practitioners.

For the study of materia medica and pharmacy there are a general pharmacy laboratory containing all the drugs used in the practice of veterinary medicine, and a practicing pharmacy where medicines are compounded for the everyday practice connected with the College.

COURSES IN SURGERY

FOR UNDERGRADUATES

101. SURGERY I. Junior year, first semester. Class work, three hours. Three semester credits. Doctor Dykstra.

This course includes methods of restraint; asepsis and antisepsis; anæsthesia, both local and general; inoculations, bandaging, massage, controlling hemorrhage; division of tissues and the uniting of wounds; injections of medicines into the subcutaneous tissues, blood streams, trachea, spinal canal. Animal dentistry is taken up very thoroughly, in so far as it constitutes an important part of the veterinarian's work. The students have free access to a large number of museum specimens of abnormal teeth. Also, many dental patients are presented at the College hospital for treatment.

106. SURGERY II. Junior year, second semester. Class work, three hours. Three semester credits. Doctor Dykstra.

This course considers in regular order the surgical diseases of the head, neck, thorax, abdomen, stomach and bowels, urinary organs, and organs of generation.

111. SURGERY III. Senior year, first semester. Class work, three hours. Three semester credits. Doctor Dykstra.

During this course particular attention is paid to causes, symptoms, and treatment of lameness. It considers in detail fractures and their reduction, diseases of joints, tendons and sheaths, muscles and fascia, and surgical diseases of the foot.

116. SURGERY IV. Senior year, second semester. Class work, three hours. Three semester credits. Doctor Dykstra.

Surgery as taught during this course includes special operations, such as neurectomies, autoplasties, desmotomies, actual cauterization, tenotomies, myotomies, enterotomy and enteroanastomosis, and surgery of the eye. Reference books: Dollar's *Regional Veterinary Surgery;* Merillat's *Veterinary Surgery,* Vols. I, II, and III; Williams' *Surgical Operations;* Fleming's *Operative Veterinary Surgery,* Parts I and II; White's *Restraint of Domestic Animals.*

121. OPERATIVE SURGERY. Senior year, second semester. Laboratory, three hours. One semester credit. Doctors Dykstra and Frick.

Old horses are purchased by the department, placed on the operating table, anæsthetized, and over one hundred operations are performed upon them. During this work the student is required to observe a careful technic, such as

antisepsis, and, in fact, performs the operation as thoroughly and completely as possible. It is a very practical course and fits the student for surgical work in actual practice.

126. HORSESHOEING. Junior year and elective, second semester. Class work, one hour. One semester credit. Doctor McLeod.

The course is taught by means of lectures, recitations and demonstrations, taking up the various divisions in the following order: normal conformation in both limb and foot, the anatomy of these parts, physiological movements and correct normal shoeing. This is followed by a study of the proper shoeing for the correction of wry limbs and feet; diseases of the feet, and the relation of horseshoeing thereto. The course ends with the study of the shoeing of mules and oxen. Throughout the entire course the purpose is to instill in the mind of the student normal shoeing, in order that he may be able to correct abnormalities in the foot and limb in so far as this can be accomplished by shoeing. Reference books: Lungwitz's *Textbook of Horseshoeing;* Dollar's *Handbook of Horseshoeing.*

COURSE IN OBSTETRICS

FOR UNDERGRADUATES

131. OBSTETRICS. Senior year and elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Anat. and Physiol. 116 and Zoöl. 109, or Anat. and Physiol. 131 and Zoöl. 117. Doctor McLeod.

This course discusses in detail the physiology of pregnancy, anatomy of the generative organs, care and hygiene of pregnant animals, sterility, diseases incidental to pregnancy, diseases of new-born animals, care of newborn animals, abnormal presentations during parturition, surgery of obstetrics, etc. This work is supplemented by demonstrations on an obstetrical phantom and fœtus; in addition, the College farm and surrounding agricultural territory furnish an abundance of actual material. References: Williams' *Veterinary Obstetrics,* Williams' *Surgical and Obstetrical Operations,* De Bruin's *Bovine Obstetrics,* and Fleming's *Veterinary Obstetrics.*

COURSES IN CLINICS

FOR UNDERGRADUATES

137. CLINICS I. Junior year, first semester. Laboratory, nine hours. One semester credit. Doctors Dykstra, Muldoon, Frick, and Shuler.

A free clinic which affords an abundance of material is conducted. All species of domesticated animals are presented for treatment. These patients are assigned in regular order to the senior students for diagnosis and treatment; clinic sheets are provided, on which are recorded the history, symptoms, pulse, temperature, respiration, diagnosis, prognosis, treatment, and the unsoundness, defects or blemishes of the animal. The clinician in charge discusses all the abnormal conditions present in the patient, thus assisting the student to develop his powers of observation. The junior students assist the senior students and, in addition, are required to master, by practical experience, the restraint of animals, bandaging, etc. The compounding of prescriptions, the preparation of antiseptics and other medicinal agents, is taken in charge by the junior students.

140. CLINICS II. Junior year, second semester. Laboratory, nine hours. One semester credit. Doctors Dykstra, Muldoon, Frick, and Shuler.

This work is a continuation of Clinics I.

143. CLINICS III. Senior year, first semester. Laboratory, twelve hours. One semester credit. Doctors Dykstra, Muldoon, Frick, and Shuler.

Patients left at the hospital for treatment are assigned to seniors, who are required to administer all medicines, change dressings of surgical wounds, etc. All work is performed under the direct supervision of the clinician in charge. Numerous country calls are received by the Division of Veterinary Medicine.

These are taken care of by one of the clinicians, who is always accompanied by one or more senior students. This phase of the work is particularly valuable, as it gives the student practical experience under actual conditions.

146. CLINICS IV. Senior year, second semester. Laboratory, twelve hours. One semester credit. Doctors Dykstra, Muldoon, Frick, and Shuler.

This work is a continuation of Clinics III.

COURSES IN MATERIA MEDICA

FOR UNDERGRADUATES

157. MATERIA MEDICA. Junior year, first semester. Class work, four hours. Four semester credits. Doctor Frick.

This course includes definitions of terms, modes of action of drugs in general, their method and rapidity of absorption and elimination, physiological and chemical incompatibilities, etc. The drugs and medicinal agents are grouped according to their action. The lecturer discusses the origin, physical properties, active constituents, and official preparations of the medicinal agents.

162. THERAPEUTICS. Junior year, second semester. Class work, three hours; laboratory, three hours. Four semester credits. Prerequisite: Materia Medica. Doctor Frick.

The student is thoroughly drilled in the physiological and therapeutic action of the various drugs both on the healthy and on the diseased animal. A course in toxicology is included in this work, and takes up the symptoms and the treatment of poisons frequently encountered in veterinary practice. The science of posology, or dosage, is considered of the utmost importance, and a liberal amount of time is devoted to it, the proper dose of the crude drug and its preparation for horses, cows, dogs, cats and swine being considered.

166. PHARMACY. Junior year, first semester. Class and laboratory work, three hours. One semester credit. Doctor Frick.

In the lectures the meanings of the various pharmaceutical terms are discussed. Various systems of weights and measures, and the conversion of one system into another, are taught. Official preparation of each is studied in regular order. Particular stress is placed upon prescription writing, the student being taught to avoid incompatibilities, to give nouns the proper case ending, and to understand the meanings of certain Latin phrases. In the laboratory work the principles of filtration, percolation, hot-water and sand baths, etc., are taught. The student is required to prepare at least one of each of the following preparations: An infusion, a decoction, a tincture, a wine, a syrup, a fluid extract, a liniment, an emulsion, a liquor, an aqua, a spirit, an ointment, an electuary, and a cataplasm. In addition, a thorough course in the compounding of prescriptions is afforded at the clinic, where all medicines are prescribed and compounded by the students, under guidance of the instructor in charge. Reference works: *U. S. Pharmacopœia;* Maltbie's *Practical Pharmacy;* Remington's *Practice of Pharmacy;* Fish's *Exercises in Materia Medica and Pharmacy.*

COURSES IN MEDICINE

FOR UNDERGRADUATES

170. DIAGNOSIS. Junior year, first semester. Class work, two hours. Two semester credits. Doctor Muldoon.

This is a course preparatory to the study of medicine proper. It takes up in detail the different diagnostic methods employed for the detection of diseases, including auscultation, percussion, palpation, and inspection, and also treats of the normal and abnormal abdominal and thoracic sounds, including diagnostic inoculations as an aid to the detection of disease.

174. DISEASES OF LARGE ANIMALS I. Junior year, second semester. Class work, four hours. Four semester credits. Doctor Muldoon.

The noninfectious diseases of the respiratory organs of the larger animals

are studied in this course, taking up in regular order the nasal and accessory cavities, the larynx, bronchi, lungs, and pleura.

177. Diseases of Large Animals II. Senior year, first semester. Class work, five hours. Five semester credits. Doctor Muldoon.

This course is devoted to the noninfectious diseases of the mouth, salivary glands, œsophagus, stomach and intestines, liver, pancreas and peritoneum of the larger animals. This is followed by diseases of the urinary organs, of the circulatory organs, diseases of metabolism, of the nervous system, of the organs of locomotion and of the skin.

181. Infectious Diseases of Large Animals. Senior year, second semester. Class work, five hours. Five semester credits. Doctor Muldoon.

In contradistinction to the preceding courses in medicine, the distinctly infectious and contagious diseases of the larger domesticated animals are discussed. The following order is usually adopted: Acute general infectious diseases, acute exanthematous infectious diseases, acute infectious diseases with localization in certain organs, infectious diseases with special involvement of the nervous system, chronic infectious diseases, infectious diseases produced by protozoa. In addition particular attention is given to the propagation and spread of infectious diseases, predisposing and exciting causes of diseases, general sanitation, etc.

183. Ophthalmology. Senior year, second semester. Class work, one hour. One semester credit. Doctor Shuler.

This course discusses the method of conducting examinations of the eye by means of the ophthalmoscope, illumination of the eye, and the use of drugs as an aid to this process; and acute and chronic diseases of the eye.

Reference books for the courses in medicine: Hutyra and Marek's *Pathology of the Diseases of Domestic Animals,* Vols. I and II; Friedberger and Frohner's *Veterinary Pathology,* Vols. I and II; Law's *Veterinary Medicine,* Vols. I, II, III, IV and V; Moussu and Dollar's *Diseases of Cattle;* Glass' *Diseases of the Dog;* Cadot's *Clinical Veterinary Medicine.*

186. Diseases of Small Animals. Senior year, second semester. Class work, two hours. Two semester credits. Doctor Muldoon.

This course deals principally with the infectious and noninfectious canine and feline diseases. The various breeds of dogs and cats, the erection of kennels, the breeding and care of puppies, care and feeding of dogs in general, and the hygienic measures pertaining thereto are also discussed.

190. Farm Animals in Health and in Disease. Elective, second semester and summer school. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Anat. and Physiol. 131. Doctor Frick.

First-aid treatment of diseases of domestic animals is discussed in this course. Special emphasis is given to the cause and prevention of disease in farm animals. Domestic animals are studied in relation to their surroundings. Text: Craig's *Common Diseases of Farm Animals.*

The Division of Engineering

ROY ANDREW SEATON, *Dean*

The Division of Engineering offers curricula in agricultural engineering, architecture, civil engineering, electrical engineering, flour-mill engineering, and mechanical engineering, each leading to the degree of bachelor of science in the profession selected.

While the curricula, as scheduled, are believed to be sufficient to cover the needs of the average young man, it is possible to combine portions of the work of two or more of them in such a way that one may be prepared to take up a special line of work for which he desires to fit himself. For example, by substituting certain courses from the departments of chemistry and geology for some of those in the curriculum in mechanical engineering, a young man can fit himself for work in connection with the manufacture of cement. By substituting some of the courses in chemistry for others in mechanical engineering, a special preparation can be secured for chemical engineering. By combining some of the courses in civil and mechanical engineering and by taking additional work in chemistry and geology, a young man may fit himself for special work in connection with the development of the coal fields of the country. By combining courses in architecture and civil engineering, specialization in architectural engineering may be secured. In special cases permission will be granted to combine the work on the lines here indicated. With the permission of the dean of the division, students desiring to do so may substitute work in the reserve officers training corps for certain subjects in any of the curricula of the division.

It is believed that the curricula as tabulated give the best preparation for students expecting to follow general work in the profession selected, and for those who are not certain what particular branch of the profession they will follow. The substitutions and combinations indicated, and others similar to them, will be permitted only when there is good evidence that the student desiring such work is practically certain to follow the branch selected.

In the case of any of these modifications, the degree granted will be that of the course in which the major portion of the work is taken. In no case will the substitution of an additional amount of technical work for any of the general cultural work in the course be allowed.

Besides the four-year professional curricula, the Division of Engineering offers:

A three-year curriculum in mechanic arts in the School of Agriculture, with trade practice electives in blacksmithing, carpentry, concrete construction, and stationary and traction engines, and

Short special courses for automobile mechanics, tractor operators, carpenters, machinists, blacksmiths, electricians, and foundrymen.

These are all discussed elsewhere in this catalogue.

CURRICULUM IN AGRICULTURAL ENGINEERING

The curriculum in agricultural engineering is designed to qualify men for engineering work in rural communities; for positions in the farm-machinery and farm-motor industry; for the management of farms where drainage, irrigation or power-farming methods are prevalent; and for the positions of advisors, consulting engineers or architects in connection with agricultural development.

The work of the first year is the same as in the other engineering curricula. During the last three years about one-third of the time is devoted to agricultural subjects, in order to familiarize the students with the modern methods

of scientific agriculture and to enable them to apply engineering principles to agricultural problems. Considerable time is devoted to farm machinery, farm motors, rural architecture, highway engineering, irrigation, drainage, and concrete construction.

CURRICULUM IN ARCHITECTURE

The curriculum in architecture aims to provide the technical training which will give a broad and sound foundation for the needs of the practicing architect, as well as the essentials of a liberal education. Although closely associated with, and somewhat dependent upon, science and engineering, architecture is primarily a fine art; hence the training of the architect, while including the general fundamentals of engineering and science, must be based primarily upon a study and understanding of the basic architectural principles together with the canons of art and good taste. A major portion of the curriculum is therefore devoted to the study of architectural design, supplemented by those subjects preparatory or contributory to it.

Supporting this line of study the student is given a comprehensive view of the development of civilization together with a more detailed study of the history of architecture and of art. Throughout the course draughtsmanship as applied to architectural design and construction, as well as to free-hand drawing and sketching, is given constant attention. Courses dealing with the fundamental principles of building construction, sanitation, heating and lighting, together with a careful study of the properties and uses of building materials, are given simultaneously with the courses in design and drawing.

In addition to the above-outlined professional and technical studies, approximately one-quarter of the curriculum is devoted to more general studies designed to broaden the student's view and to give him the essentials of a liberal education. Thus it is the aim not only to provide a fundamental training upon which the student may base his professional development and advancement, but to afford a training which is in the broadest sense educational.

CURRICULUM IN CIVIL ENGINEERING

The aim of the curriculum in civil engineering, as outlined in this catalogue, is to give the young men taking the work the best possible preparation for entering upon the active practice of the profession under present conditions. It will be noted that the first and second years are devoted largely to general culture studies and the sciences, including mathematics. This follows the arrangement generally found in the engineering curricula of American colleges, and it finds its justification in the well-nigh universally accepted idea that any engineering education worthy of consideration must be grounded upon ample preliminary education in the allied sciences. An introduction to the technical work is given in these years through courses in drawing, shopwork, surveying, and the elementary phases of engineering.

The last two years are devoted largely to technical work. In recognition of the mechanical trend of the age, liberal provision is made for class and laboratory work in mechanical and electrical engineering. In view of the growing importance of municipal problems, such as paving, sewerage, and water-supply, the curriculum in civil engineering includes required courses in these subjects.

Advanced elective courses in railway, highway, and irrigation and drainage engineering are offered in the second semester of the senior year.

CURRICULUM IN ELECTRICAL ENGINEERING

The essential elements underlying a sound engineering training are based upon a thorough study of mathematics and the physical sciences. These studies, together with introductory courses in drawing, shopwork, surveying, and the elementary phases of engineering, occupy most of the time of the first two years.

Freshmen are given courses which involve the fundamental principles of

electricity and magnetism and their application to electrical construction and machinery.

The professional work of this curriculum begins in the junior year and continues throughout the last two years. General cultural subjects are included in the work of each of the four years.

Emphasis is placed upon training to deal with forces and matter according to scientific principles, rather than upon the accumulation of facts. The department laboratories are well equipped with the various measuring instruments, standardizing apparatus, and different types of dynamo machinery. The different subjects are presented in the classroom, and the classroom work is supplemented by laboratory practice. The curriculum provides a liberal training in wood- and iron-working, mechanical drawing, and machine-shop practice.

The laboratory experiments selected for the students are designed to give a clear conception of the theoretical work of the classroom.

Students are given extensive practice in connecting up the different types of machines for testing purposes and for standard commercial work. This practice work and testing extends throughout the junior and senior years, and is intended to give the student familiarity with the underlying principles of the different machines, and a knowledge of the care necessary to operate them successfully. Opportunity is also given to undertake the investigation of commercial problems as they are sent to the College from the different central stations of the state.

CURRICULUM IN FLOUR-MILL ENGINEERING

The milling of wheat and other cereals is an important industry in this state. The curriculum in flour-mill engineering is designed to prepare men for the management of mills, for work in connection with the designing of milling plants, and for research work in the preparation and utilization of mill products.

The work of the freshman year is the same as in the other engineering courses. The sophomore year is similar to that of the mechanical engineering course, but includes additional chemistry and a beginning course in milling practice. In the junior and senior years, besides the courses dealing with the production, marketing, testing, and milling of grain products, a considerable amount of time is devoted to mechanics, chemistry, history, economics, business law and organization, steam and gas engineering, and flour-mill design.

CURRICULUM IN MECHANICAL ENGINEERING

The work in mechanical engineering prepares for the successful management and superintendence of factories and power plants; for the design of power machinery installations; for the design and construction of machine tools, steam and gas engines, compressors, hydraulic machinery, etc.; and for the design and erection of engineering buildings and factories, including the selection, purchasing, and location of the equipment.

The curriculum has been laid out with the aim of securing a judicious mixture of theory and practice, such as will not only give the student the technical skill required for engineering operations, but will also endow him with an understanding of the scientific and economic principles necessary for the solution of engineering and industrial problems.

Throughout the four years the theoretical studies in the classroom are supplemented by practical work in the laboratories in such a manner as very materially to strengthen both. In the testing laboratories the work does not end when the test is completed, but the entire problem must be written up in such a manner as would be approved in the best commercial testing laboratories. The laboratory work in the shops not only gives the student practice in performing the machining and various other mechanical operations, but includes a scientific study of the factors of production, so that the loss of material and expenditure of human effort will be a minimum.

Optional or elective courses are available in the senior year, second semester, and give the student an opportunity for instruction in the more specialized branches of mechanical engineering. These courses include: heating, ventilation, and refrigeration; factory design; aërodynamics, or aëronautical engineering; and automobile engineering.

Students pursuing a mechanical engineering curriculum are urged to spend at least two summers in some shop or commercial plant in order to broaden their training.

Curriculum in Agricultural Engineering

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester	
Chemistry E-I Chem. 107	4(3-3)	Chemistry E-II Chem. 108	4(3-3)
Plane Trigonometry Math. 101	3(3-0)	College Algebra Math. 104	3(3-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Engineering Drawing Ap. Mech. 155	2(0-6)	Descriptive Geometry Ap. Mech. 158	2(0-6)
Judging Market Live Stock An. Husb. 132	2(0-6)	Field Machinery Ag. Engr. 106, 107	2(1-3)
Extempore Speech I Pub. Spk. 106	2(2-0)	Engineering Woodwork I Shop 101	1(0-3)
		Forging I Shop 150	1(0-3)
Artillery I Mil. Tr. 113	1(0-4)	Artillery II Mil. Tr. 114	1(0-4)
Engineering Lectures Gen. Engr. 101	R	Engineering Lectures Gen. Engr. 101	R
Physical Education M-I Phys. Ed. 103	R(0-2)	Physical Education M-II Phys. Ed. 104	R(0-2)

SOPHOMORE

First Semester		Second Semester	
Engineering Physics I Physics 145	5(4-3)	Engineering Physics II Physics 150	5(4-3)
Plane Analytical Geometry Math. 110	4(4-0)	Calculus I Math. 113	5(5-0)
American Industrial History Hist. 105	3(3-0)	General Geology Geol. 103	3(3-0)
Mechanism Ap. Mech. 180	3(3-0)	Machine Drawing I Ap. Mech. 161	2(0-6)
Surveying I Civ. Engr. 102	2(0-6)	Surveying II Civ. Engr. 111	2(0-6)
Artillery III Mil. Tr. 115	1(0-4)	Artillery IV Mil. Tr. 116	1(0-4)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Physical Education M-III Phys. Ed. 105	R(0-2)	Physical Education M-IV Phys. Ed. 106	R(0-2)

JUNIOR

First Semester		Second Semester	
Applied Mechanics Ap. Mech. 101, 105	4(3-3)	Strength of Materials Ap. Mech. 110, 120	6(5-3)
Calculus II Math. 116	3(3-0)	Farm Motors Ag. Engr. 125, 126	3(2-3)
Soils Agron. 133	5(4-3)	Farm Crops Agron. 109	5(3-6)
Organic Chemistry (Agr.) Chem. 120	3(2-3)	Feeding Live Stock An. Husb. 172	3(3-0)
Power Machinery Ag. Engr. 111, 112	2(1-3)	Forging II Shop 155	1(0-3)*or*
Seminar Gen. Engr. 105	R	Foundry Practice Shop 160	1(0-3)
		Seminar Gen. Engr. 105	R

SENIOR

First Semester		Second Semester	
Economics Econ. 101	3(3-0)	Farm Organization Ag. Ec. 106	3(2-3)
Tractors and Trucks Ag. Engr. 116, 117	3(2-3)	Drainage and Irrigation I Civ. Engr. 161	2(2-0)
Farm Buildings Ag. Engr. 103	3(1-6)	Electrical Engineering C Elec. Engr. 160, 165	3(2-2, 1)
Highway Engineering I Civ. Engr. 230 and Ap. Mech. 250	3(2-3)	Steam and Gas Engineering C Mech. Engr. 120, 125	3(2-3)
Hydraulics Ap. Mech. 130, 135	4(3-3)	Machine Tool Work I Shop 170	2(0-6)
Business Law I Hist. 163	1(1-0)	Engineering English Engl. 110	2(2-0)
Seminar Gen. Engr. 105	R	Business Organization Econ. 106	1(1-0)
Thesis Ag. Engr. 175	1(0-3)	Seminar Gen. Engr. 105	R
		Thesis Ag. Engr. 175	2(0-6)

Curriculum in Architecture

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester	
Plane Trigonometry Math. 101	3(3-0)	College Algebra Math. 104	3(3-0)
Perspective Arch. 128	1(0-3)	Shades and Shadows Arch. 131	1(0-3)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Engineering Drawing Ap. Mech. 155	2(0-6)	Descriptive Geometry Ap. Mech. 158	2(0-6)
Free-hand Drawing I Arch. 111	2(0-6)	Free-hand Drawing II Arch. 114	2(0-6)
Architectural Drawing I Arch. 108	2(0-6)	Architectural Drawing II Arch. 109	2(0-6)
French I Mod. Lang. 151	3(3-0)	French II Mod. Lang. 162	3(3-0)
Artillery I Mil. Tr. 113	1(0-4)	Artillery II Mil. Tr. 114	1(0-4)
Engineering Lectures Gen. Engr. 101	R	Engineering Lectures Gen. Engr. 101	R
Physical Education M-I Phys. Ed. 103	R(0-2)	Physical Education M-II Phys. Ed. 104	R(0-2)

SOPHOMORE

First Semester		Second Semester	
Engineering Physics I Physics 145	5(4-2, 1)	Engineering Physics II Physics 150	5(4-2, 1)
Advanced Composition I Engl. 113	2(2-0)	Advanced Composition II Engl. 116	2(2-0)
History of Architecture I Arch. 153	2(2-0)	History of Architecture II Arch. 156	2(2-0)
Building Materials and Construction I Arch. 187	3(1-6)	Building Materials and Construction II Arch. 189	3(1-6)
Free-hand Drawing III Arch. 116	2(0-6)	Free-hand Drawing IV Arch. 117	2(0-6)
Design I Arch. 142	3(0-9)	Design II Arch. 144	3(0-9)
Artillery III Mil. Tr. 115	1(0-4)	Artillery IV Mil. Tr. 116	1(0-4)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Physical Education M-III Phys. Ed. 105	R(0-2)	Physical Education M-IV Phys. Ed. 106	R(0-2)

JUNIOR

First Semester		Second Semester	
Applied Mechanics A Ap. Mech. 102	3(3-0)	Strength of Materials A Ap. Mech. 116, 121	4(3-3)
Theory of Structures I Arch. 192	4(1-9)	Theory of Structures II Arch. 194	3(1-6)
History of Architecture III Arch. 159	2(2-0)	History of Architecture IV Arch. 161	2(2-0)
Free-hand Drawing V Arch. 118	2(0-6)	Free-hand Drawing VI Arch. 120	2(0-6)
Design III Arch. 145	5(0-15)	Design IV Arch. 147	5(0-15)
Mechanical Equipment Arch. 186	2(2-0)	Business Law I Hist. 163	1(1-0)
		Business Organization Econ. 106	1(1-0)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R

SENIOR

First Semester		Second Semester	
History of Civilization and Art I Arch. 180	2(3-0)	History of Civilization and Art II Arch. 184	2(3-0)
Free-hand Drawing VII Arch. 121	2(0-6)	Free-hand Drawing VIII Arch. 123	2(0-6)
Design V Arch. 148	8(0-24)	Design VI Arch. 151	8(0-24)
Structural Design I Arch. 196	3(1-6)	Structural Design II Arch. 198	3(1-6)
Economics Econ. 101	3(3-0)	Engineering English Engl. 110	2(2-0)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R

Curriculum in Civil Engineering

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester	
Chemistry E-I Chem. 107	4(3-3)	Chemistry E-II Chem. 108	4(3-3)
Plane Trigonometry Math. 101	3(3-0)	College Algebra Math. 104	3(3-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Engineering Drawing Ap. Mech. 155	2(0-6)	Descriptive Geometry Ap. Mech. 158	2(0-6)
Surveying I Civ. Engr. 102	2(0-6)	Surveying II Civ. Engr. 111	2(0-6)
Extempore Speech I Pub. Spk. 106	2(2-0)	Engineering Woodwork I Shop 101	1(0-3)
		Forging I Shop 150	1(0-3)
Artillery I Mil. Tr. 113	1(0-4)	Artillery II Mil. Tr. 114	1(0-4)
Engineering Lectures Gen. Engr. 101	R	Engineering Lectures Gen. Engr. 101	R
Physical Education M-I Phys. Ed. 103	R(0-2)	Physical Education M-II Phys. Ed. 104	R(0-2)

SOPHOMORE

First Semester		Second Semester	
Engineering Physics I Physics 145	5(4-3)	Engineering Physics II Physics 150	5(4-3)
Plane Analytical Geometry Math. 110	4(4-0)	Calculus I Math. 113	5(5-0)
American Industrial History Hist. 105	3(3-0)	Metallurgy Shop 165	2(2-0)
Surveying III Civ. Engr. 151, 155	3(2-3)	Surveying IV Civ. Engr. 156, 157	3(2-3)
Machine Drawing I Ap. Mech. 161	2(0-6)	Civil Engineering Drawing I Civ. Engr. 125	2(0-6)
Artillery III Mil. Tr. 115	1(0-4)	Artillery IV Mil. Tr. 116	1(0-4)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Physical Education M-III Phys. Ed. 105	R(0-2)	Physical Education M-IV Phys. Ed. 106	R(0-2)

JUNIOR

First Semester		Second Semester	
Applied Mechanics Ap. Mech. 101, 105	4(3-3)	Strength of Materials Ap. Mech. 110, 120	6(5-3)
Calculus II Math. 116	3(3-0)	Hydraulics Ap. Mech. 130, 135	4(3-3)
Engineering Geology Geol. 102	4(2-6)	Railway Engineering I Civ. Engr. 145	2(2-0)
Masonry and Foundations Civ. Engr. 120	2(2-0)	Drainage and Irrigation I Civ. Engr. 161	2(2-0)
Economics Econ. 101	3(3-0)	Steam and Gas Engineering C Mech. Engr. 120, 125	3(2-3)
Business Law I Hist. 163	1(1-0)		
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R

SENIOR

First Semester		Second Semester	
Bridge Stresses Civ. Engr. 201	4(4-0)	Bridge Design Civ. Engr. 246	3(0-9)
Civil Engineering Drawing II Civ. Engr. 205	2(0-6)	Electrical Engineering C Elect. Engr. 160, 165	3(2-2, 1)
Astronomy and Geodesy Civ. Engr. 211, 216	4(2-6)	Engineering English Engl. 110	2(2-0)
Water Supply Civ. Engr. 220	2(2-0)	Business Organization Econ. 106	1(1-0)
Sewerage Civ. Engr. 225	2(2-0)	Concrete Design Civ. Engr. 250, 255	3(2-3)
Highway Engineering I Civ. Engr. 230 and Ap. Mech. 250	3(2-3)	Railway Engineering II Civ. Engr. 260, 265	4(2-6) *or*
		Highway Engineering II Civ. Engr. 270, 275	4(2-6)*or*
		Drainage and Irrigation II Civ. Engr. 280, 285	4(2-6)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Thesis Ap. Mech. 150 *or* Civ. Engr. 170	1(0-3)	Thesis Ap. Mech. 150 *or* Civ. Engr. 170	2(0-6)

Curriculum in Electrical Engineering

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester	
Chemistry E-I Chem. 107	4(3-3)	Chemistry E-II Chem. 108	4(3-3)
Plane Trigonometry Math. 101	3(3-0)	College Algebra Math. 104	3(3-0)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Engineering Drawing Ap. Mech. 155	2(0-6)	Descriptive Geometry Ap. Mech. 158	2(0-6)
Engineering Woodwork I Shop 101	1(0-3)	Extempore Speech I Pub. Spk. 106	2(2-0)
Forging I Shop 150	1(0-3)		
Electrical Machinery and Construction Elect. Engr. 170	2(0-6)*or*	Surveying I Civ. Engr. 102	2(0-6)*or*
Surveying I Cov. Engr. 102	2(0-6)	Electrical Machinery and Construction Elect. Engr. 170	2(0-6)
Artillery I Mil. Tr. 113	1(0-4)	Artillery II Mil. Tr. 114	1(0-4)
Engineering Lectures Gen. Engr. 101	R	Engineering Lectures Gen. Engr. 101	R
Physical Education M-I Phys. Ed. 103	R(0-2)	Physical Education M-II Phys. Ed. 104	R(0-2)

SOPHOMORE

First Semester		Second Semester	
Engineering Physics I		Engineering Physics II	
Physics 145	5(4-3)	Physics 150	5(4-3)
Plane Analytical Geometry		Calculus I	
Math. 110	4(4-0)	Math. 113	5(5-0)
Mechanism		American Industrial History	
Ap. Mech. 180	3(3-0)	Hist. 105	3(3-0)
Machine Drawing I		Machine Drawing II	
Ap. Mech. 161	2(0-6)	Ap. Mech. 170	3(0-9)
Metallurgy			
Shop 165	2(2-0)		
Foundry Practice		Forging II	
Shop 160	1(0-3)	Shop 155	1(0-3)
Artillery III		Artillery IV	
Mil. Tr. 115	1(0-4)	Mil. Tr. 116	1(0-4)
Seminar		Seminar	
Gen. Engr. 105	R	Gen. Engr. 105	R
Physical Education M-III		Physical Education M-IV	
Phys. Ed. 105	R(0-2)	Phys. Ed. 106	R(0-2)

JUNIOR

First Semester		Second Semester	
Applied Mechanics		Strength of Materials E	
Ap. Mech. 101, 105	4(3-3)	Ap. Mech. 115, 120	4(3-3)
Calculus II		Hydraulics	
Math. 116	3(3-0)	Ap. Mech. 130, 135	4(3-3)
Economics		Pattern Making	
Econ. 101	3(3-0)	Shop 145	1(0-3)
Direct-current Machines I		Direct-current Machines II	
Elect. Engr. 101, 105	4(3-2, 1)	Elect. Engr. 111, 115	3(2-2, 1)
Electrical Measurements		Alternating-current Machines I	
Elect. Engr. 122, 126	3(2-2, 1)	Elect. Engr. 201, 205	3(2-2, 1)
		Machine Tool Work I	
		Shop 170	2(0-6)
Seminar		Seminar	
Gen. Engr. 105	R	Gen. Engr. 105	R

SENIOR

First Semester		Second Semester	
Steam and Gas Engineering I		Steam and Gas Engineering II	
Mech. Engr. 101, 105	5(4-3)	Mech. Engr. 110, 115	4(3-3)
Alternating-current Machines II		Electric Railways	
Elect. Engr. 210, 215	6(4-4, 2)	Elec. Engr. 240	2(2-0)
Electrical Machine Design I		Electrical Machine Design II	
Elect. Engr. 150	1(0-3)	Elec. Engr. 155	2(0-6)
Telephony		Illuminating Engineering	
Elect. Engr. 220, 225	3(2-3)	Elec. Engr. 235, 236	3(2-3)
Factory Engineering		Business Law I	
Shop 245, 250	2(1-3)	Hist. 163	1(1-0)
		Business Organization	
		Econ. 106	1(1-0)
		Engineering English	
		Engl. 110	2(2-0)
Seminar		Seminar	
Gen. Engr. 105	R	Gen. Engr. 105	R
Thesis		Thesis	
Elect. Engr. 195	1(0-3)	Electr. Engr. 195	2(0-6)

Curriculum in Flour-mill Engineering

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester	
Chemistry E-I		Chemistry E-II	
Chem. 107	4(3-3)	Chem. 108	4(3-3)
Plane Trigonometry		College Algebra	
Math. 101	3(3-0)	Math. 104	3(3-0)
College Rhetoric I		College Rhetoric II	
Engl. 101	3(3-0)	Engl. 104	3(3-0)
Extempore Speech I			
Pub. Spk. 106	2(2-0)		
Engineering Drawing		Descriptive Geometry	
Ap. Mech. 155	2(0-6)	Ap. Mech. 158	2(0-6)
Engineering Woodwork I		Elements of Steam and Gas Power	
Shop 101	1(0-3)	Mech. Engr. 130	2(0-6)
Forging I		Surveying I	
Shop 150	1(0-3)	Civ. Engr. 102	2(0-6)
Artillery I		Artillery II	
Mil. Tr. 113	1(0-4)	Mil. Tr. 114	1(0-4)
Engineering Lectures		Engineering Lectures	
Gen. Engr. 101	R	Gen. Engr. 101	R
Physical Education M-I		Physical Education M-II	
Phys. Ed. 103	R(0-2)	Phys. Ed. 104	R(0-2)

SOPHOMORE

First Semester		Second Semester	
Engineering Physics I		Engineering Physics II	
Physics 145	5(4-3)	Physics 150	5(4-3)
Plane Analytical Geometry		Calculus I	
Math. 110	4(4-0)	Math. 113	5(5-0)
Organic Chemistry (Agr.)		Mechanism	
Chem. 120	3(2-2, 1)	Ap. Mech. 180	3(3-0)
Business Law I			
Hist. 163	1(1-0)		
Machine Drawing I		Machine Drawing II	
Ap. Mech. 161	2(0-6)	Ap. Mech. 170	3(0-9)
Quantitative Analysis I		Principles of Milling	
Chem. 150	2(0-6)	Mill. Ind. 101	1(0-3)
Artillery III		Artillery IV	
Mil. Tr. 115	1(0-4)	Mil. Tr. 116	1(0-4)
Seminar		Seminar	
Gen. Engr. 105	R	Gen. Engr. 105	R
Physical Education M-III		Physical Education M-IV	
Phys. Ed. 105	R(0-2)	Phys. Ed. 106	R(0-2)

JUNIOR

First Semester		Second Semester	
Applied Mechanics		Strength of Materials E	
Ap. Mech. 101, 105	4(3-3)	Ap. Mech. 115, 120	4(3-3)
Calculus II		Hydraulics	
Math. 116	3(3-0)	Ap. Mech. 130, 135	4(3-3)
Grain Crop Production		Advanced Quantitative Analysis	
Agron. 101	3(2-3)	Chem. 260	2(0-6)
Grain Marketing		Economics	
Mill. Ind. 102	3(3-0)	Econ. 101	3(3-0)
Milling Practice I		Grain Products	
Mill. Ind. 109	3(1-6)	Mill. Ind. 103	2(2-0)
Milling Entomology		Milling Practice II	
Ent. 116	1(1-0)	Mill. Ind. 110	2(0-6)
Seminar		Seminar	
Gen. Engr. 105	R	Gen. Engr. 105	R

SENIOR

First Semester		Second Semester	
Wheat and Flour Testing		Experimental Baking A	
Mill. Ind. 203	4(1-9)	Mill. Ind. 204	2(0-6)
Flour-mill Design		Steam and Gas Engineering II	
Ap. Mech. 215	2(0-6)	Mech. Engr. 110, 115	4(3-3)
Steam and Gas Engineering I		Refrigeration, Heating and Ventilation	
Mech. Engr. 101, 105	5(4-3)	Mech. Engr. 210, 215	3(2-3)
American Industrial History		Electrical Engineering C	
Hist. 105	3(3-0)	Elect. Engr. 160, 165	3(2-2, 1)
Business Organization		Engineering English	
Econ. 106	1(1-0)	Engl. 110	2(2-0)
Factory Engineering		Machine Tool Work I	
Shop 245, 250	2(1-3)	Shop 170	2(0-6)
Seminar		Seminar	
Gen. Engr. 105	R	Gen. Engr. 105	R
Thesis		Thesis	
Ap. Mech. 150, Mech. Engr. 195 *or* Shop 195	1(0-3)	Ap. Mech. 150, Mech. Engr. 195 *or* Shop 195	2(0-6)

Curriculum in Mechanical Engineering

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester	
Chemistry E-I		Chemistry E-II	
Chem. 107	4(3-3)	Chem. 108	4(3-3)
Plane Trigonometry		College Algebra	
Math. 101	3(3-0)	Math. 104	3(3-0)
College Rhetoric I		College Rhetoric II	
Engl. 101	3(3-0)	Engl. 104	3(3-0)
Engineering Drawing		Descriptive Geometry	
Ap. Mech. 155	2(0-6)	Ap. Mech. 158	2(0-6)
Extempore Speech I		Surveying I	
Pub. Spk. 106	2(2-0)	Civ. Engr. 102	2(0-6)
{ Engineering Woodwork I		Elements of Steam and Gas Power	
Shop 101	1(0-3) }	Mech. Engr. 130	2(0-6) *or*
{ Forging I		{ Engineering Woodwork I	
Shop 150	1(0-3) } *or*	Shop 101	1(0-3) }
Elements of Steam and Gas Power		{ Forging I	
Mech. Engr. 130	2(0-6)	Shop 150	1(0-3) }
Artillery I		Artillery II	
Mil. Tr. 113	1(0-4)	Mil. Tr. 114	1(0-4)
Engineering Lectures		Engineering Lectures	
Gen. Engr. 101	R	Gen. Engr. 101	R
Physical Education M-I		Physical Education M-II	
Phys. Ed. 103	R(0-2)	Phys. Ed. 104	R(0-2)

SOPHOMORE

First Semester		Second Semester	
Engineering Physics I Physics 145	5(4-3)	Engineering Physics II Physics 150	5(4-3)
Plane Analytical Geometry Math. 110	4(4-0)	Calculus I Math. 113	5(5-0)
Mechanism Ap. Mech. 180	3(3-0)	American Industrial History Hist. 105	3(3-0)
Machine Drawing I Ap. Mech. 161	2(0-6)	Machine Drawing II Ap. Mech. 170	3(0-9)
Metallurgy Shop 165	2(2-0)		
Forging II Shop 155	1(0-3)	Foundry Practice Shop 160	1(0-3)
Artillery III Mil. Tr. 115	1(0-3)	Artillery IV Mil. Tr. 116	1(0-4)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Physical Education M-III Phys. Ed. 105	R(0-2)	Physical Education M-IV Phys. Ed. 106	R(0-2)

JUNIOR

First Semester		Second Semester	
Applied Mechanics Ap. Mech. 101, 105	4(3-3)	Strength of Materials Ap. Mech. 110, 120	6(5-3)
Calculus II Math. 116	3(3-0)	Hydraulics Ap. Mech. 130, 135	4(3-3)
Steam and Gas Engineering I Mech. Engr. 101, 105	5(4-3)	Steam and Gas Engineering II Mech. Engr. 110, 115	4(3-3)
Business Law I Hist. 163	1(1-0)		
Pattern Making Shop 145	1(0-3)		
Graphic Statics Ap. Mech. 125	1(0-3)	Machine Design I Ap. Mech. 175	1(0-3)
Machine Tool Work I Shop 170	2(0-6)	Machine Tool Work II Shop 192	2(0-6)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R

SENIOR

First Semester		Second Semester	
Electrical Engineering M-I Elect. Engr. 130, 135	4(3-2, 1)	Electrical Engineering M-II Elect. Engr. 140, 145	4(3-2, 1)
Power Plant Engineering Mech. Engr. 206	3(0-9)	Refrigeration, Heating and Ventilation Mech. Engr. 210, 215	3(2-3) *or*
		Aërodynamics Mech. Engr. 220, 225	3(2-3)
Machine Design II Ap. Mech. 201, 205	5(3-6)	Machine Design III Ap. Mech. 210	2(0-6)
Factory Engineering Shop 245, 250	2(1-3)	Factory Design Shop 255	2(0-6) *or*
		Automotive Engineering Shop 196, 197	2(1-3)
Economics Econ. 101	3(3-0)	Engineering English Engl. 110	2(2-0)
		Business Organization Econ. 106	1(1-0)
		Machine Tool Work III Shop 193	1(0-3)
Seminar Gen. Engr. 105	R	Seminar Gen. Engr. 105	R
Thesis Ap. Mech. 150, Shop 195 *or* Mech. Engr. 195	1(0-3)	Thesis Ap. Mech. 150, Shop 195 *or* Mech. Engr. 195	2(0-6)

Agricultural Engineering

Professor WALKER
Associate Professor SANDERS
Assistant Professor DRIFTMIER
Assistant SMITH
Assistant WHITAKER

This department gives instruction in such branches of engineering as are directly related to agriculture. It also correlates and gives general supervision to such courses presented in other engineering departments as are open to students in agriculture and agricultural engineering, in order that the agricultural application and uses of engineering principles, methods, and materials may be kept clearly before the student.

In all the courses given, the time is carefully apportioned between the classroom and the laboratory, in order to present the subject in the clearest and most forceful way. The practical application of theoretical principles is emphasized.

The laboratory equipment is unusually ample and complete; all kinds of modern farm implements and equipment, to the value of nearly $18,000, are available, whereby their construction, operation, adjustment, and care may be fully covered in the field and laboratory studies. The study of traction engines is arranged to cover thoroughly the construction, operation and repair of the numerous modern tractors which are part of the regular equipment; traction tests in conjunction with various types of farm power machinery are also made. The tractor laboratory is equipped with four tractor power units mounted on bases, with various types of tractor ignition apparatus, and with complete apparatus for power and draft tests. All farm machinery and tractor equipment is kept up to date through a system of exchange with the manufacturers whereby old machines are replaced, when advisable, by new ones.

The comparatively recent development of this work, and its rapidly growing importance, renders investigational study very valuable, and special attention is given to the courses covering this phase of the subject.

COURSES IN AGRICULTURAL ENGINEERING

FOR UNDERGRADUATES

103. FARM BUILDINGS. Senior year and elective, both semesters. Class work, one hour. Drafting-room practice, six hours. Three semester credits. Professor Walker.

This course includes lectures on the requirements, details of arrangement, and materials of construction for barns, storage, and work buildings for the farm. The preparation of specifications, bills of material, and estimates of costs is an essential part of the course. In the drafting-room, plans are prepared for typical farm buildings. Text: Foster and Carter's *Farm Buildings*.

106. FIELD MACHINERY RECITATION. Freshman year and elective, both semesters. Class work, one hour. One semester credit. Assistant Professor Driftmier.

The fundamentally important definitions and principles relating to farm machinery are first given, this being followed by material concerning the development, construction, operation, and use of soil preparation, seeding, cultivating, harvesting, and miscellaneous machinery. The importance of proper selection and care of farm machinery is emphasized. Text: Davidson and Chase's *Farm Machinery and Farm Motors*.

107. FIELD MACHINERY LABORATORY. Freshman year, and elective, both semesters. Laboratory, three hours. One semester credit. Assistant Professor Driftmier and Mr. Smith.

A detailed study of the machines taken up in the classroom is conducted both in the laboratory and in the field.

111. POWER MACHINERY RECITATION. Junior year, first semester. Class work, one hour. One semester credit. Prerequisite: Field Machinery. Assistant Professor Driftmier.

This course continues the study of field machinery with special reference to those machines requiring mechanical power for their operation, including engine plows, hay balers, feed mills, corn shellers, ensilage cutters, and threshing machines.

112. POWER MACHINERY LABORATORY. Junior year, and elective, first semester. Laboratory, three hours. One semester credit. Assistant Professor Driftmier and Mr. Whitaker.

Laboratory and field instruction is given and tests are conducted upon the machines discussed in the classroom.

116. TRACTORS AND TRUCKS RECITATION. Senior year, and elective, both semesters. Lectures and recitations, two hours. Two semester credits. Prerequisite: Farm Motors. Associate Professor Sanders and Mr. Whitaker.

This course covers the study of the construction and operation of tractors and trucks, with special reference to machines using internal combustion engines as power units. Text: Consoliver and Mitchell's *Automotive Ignition.*

117. TRACTORS AND TRUCKS LABORATORY. Senior year, and elective, both semesters. Laboratory, three hours. One semester credit. Associate Professor Sanders and Mr. Whitaker.

A study is made of the construction of steam and gas tractors and trucks and practice is given in the operation and testing of these machines under belt, road, and field conditions.

119. FARM SANITATION AND WATER SUPPLY. Elective, second semester. Class work, two hours. Two semester credits. No prerequisite. Professor Walker.

A study is made of water geology, development of water supplies for the farm, water contamination, water systems, pumping equipment, cisterns, household sewage disposal, collection of farm wastes, and the sanitary arrangement of the farm buildings.

120. FARM EQUIPMENT RECITATION. Elective, both semesters. Lectures and recitations, one hour. One semester credit. Assistant Professor Driftmier.

A study of handy farm practices and important items of equipment for the farmstead is made in this course. Text: Ramsower's *Equipment for the Farm and Farmstead.*

121. FARM EQUIPMENT LABORATORY. Elective, both semesters. Laboratory, three hours. One semester credit. Assistant Professor Driftmier.

Practice is given in rope work, including knots, splices and halters; belt lacing and splicing; soldering, pipe fitting; and repairing of farm machinery.

125. FARM MOTORS RECITATION. Junior year, and elective, both semesters. Lectures and recitations, two hours. Two semester credits. Associate Professor Sanders.

This course involves a descriptive study of steam engines, boilers, internal-combustion engines and automobiles, with special reference to their utilization on the farm. Text: Streeter's *Internal Combustion Engines.*

126. FARM MOTORS LABORATORY. Junior year, and elective, both semesters. Laboratory, three hours. One semester credit. Associate Professor Sanders and assistants.

In the laboratory, tests are conducted upon the machines discussed in the classroom. Draft tests are made on various types of farm machines. A study is made also of the cost of operating these machines.

135. ADVANCED TRACTORS AND TRUCKS. Elective, both semesters. Laboratory, six hours. Two semester credits. Prerequisite: Tractors and Trucks, and Power Machinery. Associate Professor Sanders and Assistant Professor Driftmier.

Draft, power, and fuel economy tests are made upon standard types of tractors and trucks.

140. ELEMENTS OF IRRIGATION AND DRAINAGE RECITATION. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Soils (Agron. 131). Professor Walker.

This course comprises a study of the fundamental principles of land reclamation by drainage and irrigation with special reference to agricultural development. Texts: Elliott's *Engineering for Land Drainage,* Fortier's *Use of Water in Irrigation.*

145. ELEMENTS OF IRRIGATION AND DRAINAGE LABORATORY. Elective, both semesters. Field and drafting-room work, three hours. One semester credit. Professor Walker.

Practice work in the field and drafting room is developed in the laying out and plotting of farm drainage and irrigation systems. Texts: Same as for Ag. Engr. 140.

175. THESIS. Senior year, continuing through both semesters. First semester: laboratory, three hours; one semester credit. Second semester: laboratory, six hours; two semester credits. Professor Walker, Associate Professor Sanders, and Assistant Professor Driftmier.

Original problem relating to subjects taught in this department are assigned for investigation, after consultation with the head of the department, at the beginning of the first semester of the senior year.

FOR GRADUATES AND UNDERGRADUATES

205. FARM MACHINERY RESEARCH. Elective, both semesters. Six to fifteen hours laboratory or reading. Two to five semester credits. Assignment by permission. Prerequisites: Field Machinery and Power Machinery and such other preparation as may be necessary to conduct properly the investigation assigned. Associate Professor Sanders and Assistant Professor Driftmier.

Farm machinery offers a broad field for original investigation along the lines of draft requirements, power consumption, and cost of operating. Students admitted to this course are assigned to one project.

215. TRACTOR RESEARCH. Elective, both semesters. Six to fifteen hours laboratory, computation, or reading. Two to five semester credits. Prerequisites: Tractors and Trucks, and such other preparation as may be necessary to conduct properly the problem assigned. Associate Professor Sanders and Assistant Professor Driftmier.

Intensive studies are made of problems relating to tractor operation and construction.

Applied Mechanics and Machine Design

Dean SEATON
Associate Professor PEARCE
Associate Professor SCHOLER
Assistant Professor ROBERT
Assistant Professor WOJTASZAK
Assistant Professor DAWLEY
Assistant Professor BARR
Assistant Professor SMUTZ
Assistant Professor DURLAND
Instructor HUNT
Instructor ALLEN
Instructor RUBENSTYNE

The aim of the courses in applied mechanics is to give to the engineering student a practical working knowledge of those fundamental principles upon which his future work in structural and machine design may be based.

The courses in machine design deal with the mechanical transmission of power, the analysis of the action of machinery, the design of machines, and the application of the graphical language to engineering problems. Commercial drafting-room methods of representation are used for all working drawings.

The materials-testing laboratory is well equipped with machines and apparatus for making physical tests of materials of construction, such as tension, compression, flexure, shear, torsion, hardness and impact tests, and tests under repeated load. Some of the machines are of sufficient capacity to test full-size structural and machine members to destruction, among them being

a universal machine of 200,000 pounds capacity, with extension members for testing long beams and columns. Facilities are provided for making, curing, and testing concrete and reinforced concrete test specimens.

The materials-testing laboratory also has complete equipment for the testing of highway materials, and has been designated as the official laboratory of the Kansas Highway Commission.

The hydraulics laboratory has facilities for furnishing water under a considerable range of pressures and volumes. It contains devices for measuring and recording the flow of water, including measuring pits, water meters, weirs, nozzles, pitometer, and a Venturi meter. It is also provided with pumps, a standpipe, water motors, and a turbine water wheel for testing purposes, and a supply of pressure gauges, weighing scales, and other auxiliary apparatus.

COURSES IN APPLIED MECHANICS

FOR UNDERGRADUATES

101. APPLIED MECHANICS RECITATION. Junior year, first semester and summer school. Class work, three hours. Three semester credits. Prerequisites: Calculus I (Math. 113) and Engineering Physics II (Physics 150). Associate Professor Scholer, Assistant Professors Robert and Wojtaszak.

A study is made of the analytical and graphical composition, resolution, and conditions of equilibrium of concurrent and nonconcurrent forces; center of gravity; friction; laws of rectilinear and curvilinear motion of material points; moments of inertia; relations between forces acting on rigid bodies and the resulting motions; and of work, energy, and power. Text: Poorman's *Applied Mechanics.*

102. APPLIED MECHANICS A RECITATION. Junior year, first semester. Class work, three hours. Three semester credits. Prerequisites: Plane Analytical Geometry (Math. 110), and Engineering Physics I (Physics 145). Assistant Professors Robert and Wojtaszak.

This course comprises a study of statics, with applications to stresses in structures; center of gravity; and moment of inertia. Algebraic methods are generally employed, supplemented by graphic construction and numerous examples.

105. APPLIED MECHANICS LABORATORY. Junior year, first semester and summer school. Laboratory work, three hours. One semester credit. Must accompany or follow Applied Mechanics I Recitation. Assistant Professors Robert, Wojtaszak, and Dawley.

Exercises are given in the calibration and use of laboratory measuring instruments and apparatus, such as micrometers, planimeters, dynamometers, platform scales, jacks, hoists and various types of testing machines. Standard tests are also made on cement. Text: Hatt and Schofield's *Laboratory Manual for Testing Materials.*

110. STRENGTH OF MATERIALS RECITATION. Junior year, second semester and summer school. Class work, five hours. Five semester credits. Prerequisite: Applied Mechanics. Associate Professor Scholer and Assistant Professors Robert, Wojtaszak and Mr. Allen.

Behavior of materials subjected to tension, compression, and shear; riveted joints; torsion; shafts, and the transmission of power; strength and stiffness of simple and continuous beams and cantilevers; bending moments and shear forces in beams; design of beams of wood, steel and reinforced concrete; design of built-up beams and box girders; resilience of beams; stresses in columns and hooks; and the design of columns of wood, steel and reinforced concrete. Text: Boyd's *Strength of Materials* and Hool's *Reinforced Concrete Construction,* Vol. 1. Carnegie's *Pocket Companion* is used for reference.

115. STRENGTH OF MATERIALS E RECITATION. Junior year, second semester and summer school. Class work, three hours. Three semester credits. Prerequisite: Applied Mechanics. Associate Professor Scholer and Assistant Professors Robert and Wojtaszak.

The subject matter of this course is similar to that of Strength of Materials, but much less time is devoted to the study of continuous girders and of reinforced concrete. Text: Boyd's *Strength of Materials.* Carnegie's *Pocket Companion* is used for reference.

116. STRENGTH OF MATERIALS A RECITATION. Junior year, second semester. Class work, three hours. Three semester credits. Prerequisites: Applied Mechanics A Recitation. Assistant Professors Robert and Barr.

Behavior of materials subjected to tension, compression, and shear; strength and stiffness of simple beams; moment and shear in flexure of beams, with diagrams; design of beams of wood, steel and reinforced concrete, and design and investigation of columns.

120. STRENGTH OF MATERIALS LABORATORY. Junior year, second semester and summer school. Laboratory work, three hours. One semester credit. Must accompany or follow Strength of Materials or Strength of Materials E Recitation. Assistant Professors Robert, Wojtaszak, Dawley and Mr. Allen.

Tension, compression, shear and bending tests are made on specimens of iron, steel, wood, and concrete. These include standard commercial tests and tests to determine the elastic properties of the materials. Torsion tests are also made on steel shafting. Standard tests are made on fine and coarse aggregates for concrete, and on brick.

121. STRENGTH OF MATERIALS A LABORATORY. Junior year, second semester. Laboratory work, three hours. One semester credit. Must accompany or follow Strength of Materials A Recitation. Assistant Professor Barr.

This course comprises the use of micrometers, planimeters, and slide rules and a study of the various testing machines. Tension, compression, shear, and bending tests are made on specimens of iron, steel, wood, and concrete. Tests are also made on cement and on the fine and coarse aggregates for concrete.

125. GRAPHIC STATICS. Junior year, first semester. Drafting-room practice, supplemented by lectures, three hours. One semester credit. Must accompany or follow Applied Mechanics or Applied Mechanics A. Assistant Professor Wojtaszak.

Graphical solutions are made of the stresses existing in a number of typical trusses, under a variety of loadings.

130. HYDRAULICS RECITATION. Junior and senior years, both semesters. Class work, three hours. Three semester credits. Prerequisite: Applied Mechanics. Assistant Professors Robert and Wojtaszak.

This course comprises a study of fluid pressures, stresses in containing vessels and pipes, center of pressure, immersion and flotation; Bernoulli's theorem, with applications; flow through orifices, weirs, short and long pipes; loss of head due to various causes; flow of water in open channels, and its measurement; Kutter's formula; impulse and reaction of a jet; elements of water power, impulse wheels, reaction turbines, and centrifugal pumps. Text: Daugherty's *Hydraulics.*

135. HYDRAULICS LABORATORY. Junior and senior years, both semesters. Laboratory work, three hours. One semester credit. Must accompany or follow Hydraulics Recitation (Ap. Mech. 130). Assistant Professors Robert and Wojtaszak.

Tests are made to determine the coefficients of weirs and orifices; use and calibration of water meters are studied; tests are taken to determine loss of head in pipes due to various causes, and tests are made on water wheels, water turbines, rams, and pumps.

150. THESIS. Senior year, continuing through the year. First semester: laboratory, three hours; one semester credit. Second semester: laboratory, six hours; two semester credits. Dean Seaton, Associate Professor Scholer, and Assistant Professor Robert.

The laboratories of the department furnish an excellent opportunity for experimental work in strength of materials, road materials, concrete and hydraulics, suitable for thesis projects of students in any branch of engineering.

Projects in machine design may also be worked out as theses. The subject of the investigation should be selected in consultation with the head of the department at the beginning of the first semester of the senior year.

FOR GRADUATES AND UNDERGRADUATES

250. HIGHWAY ENGINEERING I LABORATORY. Senior year, first semester. Laboratory work, three hours. One semester credit. Prerequisite: Strength of Materials Laboratory. Associate Professor Scholer.

This is a comprehensive course in the examination and testing of bituminous and nonbituminous road materials. Text: Blanchard's *Highway Engineers' Handbook.*

255. ADVANCED APPLIED STATICS. Elective, first or second semester. Class work, two hours. Two semester credits. Prerequisite: Strength of Materials or Strength of Materials E. Dean Seaton and Associate Professor Scholer.

This course includes advanced problems in equilibrium of forces and stresses in framed structures, including certain statically indeterminate cases.

260. ADVANCED APPLIED KINETICS. Elective, first or second semester. Class work, two hours. Two semester credits. Prerequisite: Strength of Materials or Strength of Materials E. Dean Seaton and Assistant Professor Robert.

Advanced problems in kinetics are given with special attention to the kinetics of rigid bodies.

265. ADVANCED MECHANICS OF MATERIALS. Elective, first or second semester. Class work, two hours. Two semester credits. Prerequisite: Strength of Materials or Strength of Materials E. Dean Seaton or Associate Professor Scholer.

A study is made of the theory of elasticity and its applications, of elastic and masonry arches, and advanced problems in continuous girders involving the general three moment equations.

270. HYDRAULIC MACHINERY. Elective, first or second semester. Class work, two hours. Two semester credits. Prerequisite: Hydraulics. Associate Professor Scholer and Assistant Professor Robert.

A study is made of the characteristics and applications of water wheels, turbines, pumps, and other hydraulic machinery.

275. ROAD MATERIALS. Elective, first or second semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Highway Engineering I Laboratory. Associate Professor Scholer.

An advanced course in the properties and testing of the various materials used in road construction is here given.

280. MECHANICS OF REINFORCED CONCRETE. Elective, first or second semester. Class work, two hours. Two semester credits for students who have not taken Strength of Materials (Ap. Mech. 110) or its equivalent. Prerequisite: Strength of Materials E (Ap. Mech. 115). Associate Professor Scholer.

The behavior of reinforced-concrete structural elements, including slabs, rectangular beams, T-beams, columns and special floor systems under load, is studied.

FOR GRADUATES

301. RESEARCH IN MATERIALS OF CONSTRUCTION. Elective, first or second semester. One semester credit for each three hours of laboratory work. Dean Seaton and Associate Professor Scholer.

Many problems related to materials used in engineering construction offer attractive fields for research. A number of special pieces of apparatus in addition to the usual equipment of strength of materials laboratory are available for this work. The results of such investigations, if suitable, may be incorporated in bulletins of the Engineering Experiment Station.

This work may furnish material for the master's thesis.

COURSES IN DRAWING AND MACHINE DESIGN

FOR UNDERGRADUATES

155. ENGINEERING DRAWING. Freshman year, both semesters and summer school. Drafting, supplemented by lectures and recitations, six hours. Two semester credits. Assistant Professor Smutz and Mr. Hunt.

Instruction is given in the selection and use of drawing instruments, construction of geometrical figures, lettering, orthographic projections and sections, and pictorial methods of representation. Text: French's *Engineering Drawing*.

158. DESCRIPTIVE GEOMETRY. Freshman year, both semesters and summer school. Drafting practice with lectures and recitations, six hours. Two semester credits. Prerequisites: Engineering Drawing, and Solid Geometry. Assistant Professor Smutz and Mr. Hunt.

In this course, which is a continuation of Engineering Drawing, more advanced problems, involving the point, line, and plane; the intersection and development of the surfaces of geometric solids; single-curved, and double-curved surfaces, with their sections, tangents and tangent planes, as well as the practical applications of the principles involved, are studied. Emphasis is laid on developing the student's ability to visualize drawings in the third angle. Text: Higbee's *Essentials of Descriptive Geometry*.

161. MACHINE DRAWING I. Sophomore year, both semesters and summer school. Drafting, with lectures and recitations, six hours. Two semester credits. Prerequisite: Descriptive Geometry. Associate Professor Pearce, Assistant Professor Durland, and Mr. Rubenstyne.

A study is made of conventional representations, working drawings, modern drafting-room systems, and the reproduction of drawings. Additional practice is given in the inclined Gothic and Reinhardt systems of lettering. Working drawings, both detail and assembly, are made from assigned plates. Special emphasis is given to the proper selection of views to present the necessary information in convenient forms, dimensioning, checking for errors, and the subject matter and arrangement of titles and notes. Text: French's *Engineering Drawing*.

170. MACHINE DRAWING II. Sophomore and junior years, second semester and summer school. Drafting, nine hours. Three semester credits. Prerequisites: Machine Drawing I. Mechanism (Ap. Mech. 180) must accompany or precede this course. Associate Professor Pearce, Assistant Professor Durland, and Mr. Hunt.

About one-half of the time is occupied in making free-hand sketches of simple machine parts and complete working drawings from these sketches without further reference to the objects. At least one drawing is traced, and a blue print made from the tracing. The remainder of the semester is devoted to kinematic problems, including belting, cams, linkages, and gears to fulfill specified conditions. Center line drawings are first made, embodying the solution of the problems, and upon these are built working drawings of the machine parts. An effort is made to follow standard practice in the design of those details usually determined by empirical methods. Displacement and velocity diagrams are drawn for linkages and cams.

175. MACHINE DESIGN I. Junior year, second semester. Drafting, three hours. One semester credit. Prerequisite: Machine Drawing II and Steam and Gas Engineering I (Mech. Engr. 101). Associate Professor Pearce.

This includes the solution of a problem on the slide valve by the Bilgram diagram, followed by the design, mostly by empirical methods, of the cylinder, piston, steam chest, and valve of a steam engine. All calculations and sketches are carefully kept in notebooks. Mark's *Mechanical Engineers' Handbook* is extensively used for reference. Manufacturers' catalogues and blue prints are also used for reference.

180. MECHANISM. Sophomore and junior years, both semesters and summer school. Lectures and recitations, three hours. Three semester credits. Prerequisites: Plane Trigonometry (Math. 101) and Descriptive Geometry (Ap. Mech. 158). Associate Professor Pearce, and Assistant Professor Durland.

A careful study is made of the fundamental elements of machinery with reference to the transmission of motion and force, and to their forms and arrangements in actual machines. Among the subjects discussed are: bearings; screws; worms and wheels; rolling cylinders, cones and discs; belts, ropes, and chains; cams, levers, and linkwork, with their motion, velocity, and force diagrams; special forms of linkages, such as quick return and straight-line motions; gear-tooth outlines, and trains of gears. The solution of a large number of graphical and mathematical problems is required in this course. Text: Schwamb and Merrill's *Elements of Mechanism.*

FOR GRADUATES AND UNDERGRADUATES

201. MACHINE DESIGN II RECITATION. Senior year, first semester. Lectures and recitations, three hours. Three semester credits. Prerequisites: Strength of Materials and Machine Drawing II (Ap. Mech. 110, 170); Steam and Gas Engineering II (Mech. Engr. 110). Must accompany Machine Design II Laboratory (Ap. Mech. 205). Associate Professor Pearce.

A study is made of the straining actions in machine elements in general with special attention to the design of springs, riveted fastenings, screw fastenings, keys, force fits, cylinders, plates, journals, bearings, shafting, clutches, couplings, and belt, rope, chain and gear transmissions. Some time is devoted to a study of friction and lubrication, to the action of reciprocating parts in engines, and to the problems arising in the design of high-speed machinery. Text: Leutwiler's *Machine Design* and Lanza's *Dynamics of Machinery.*

205. MACHINE DESIGN II LABORATORY. Senior year, first semester. Drafting, six hours. Two semester credits. Must accompany Machine Design II Recitation (Ap. Mech. 201). Associate Professor Pearce.

A steam boiler is designed in strict conformity to the *A. S. M. E. Boiler Code.* Calculations are made for all parts except standard fittings, and working drawings are made. In the latter part of the course designs are made for a large pulley, shaft, and shaft coupling. All calculations and sketches are kept in notebooks.

210. MACHINE DESIGN III. Senior year, second semester. Drafting, six hours. Two semester credits. Prerequisites: Machine Design II (Ap. Mech. 201, 205). Associate Professor Pearce.

This is a continuation of Machine Design I Laboratory. A small power shear is designed. Calculations are made for all parts, and a graphical analysis is made of the stresses in the shaft. Working drawings are made.

215. FLOUR-MILL DESIGN. Senior year, first semester. Drafting, supplemented by lectures and assigned reading, six hours. Two semester credits. Prerequisites: Strength of Materials E (Ap. Mech. 115) and Milling Practice I (Mill. Ind. 201). Associate Professor Pearce.

A design is made for a medium capacity flour mill, including the selection and the planning of the arrangement of the machinery.

FOR GRADUATES.

355. ADVANCED MACHINE DESIGN. Elective, first or second semester. One semester credit for each three hours of drafting-room work. Associate Professor Pearce.

One or more complete machines are designed. The necessary calculations and graphical and mathematical analyses are made, and commercial practices are investigated.

This course may furnish material for the master's thesis.

Architecture

Professor BAKER
Professor WALTERS (Emeritus)
Assistant Professor WEIGEL
Assistant Professor BARR
Instructor DEHNER

The courses in architecture are offered not only to provide for the fundamental training necessary for the practice of architecture, but also to give the student a facility and working knowledge which will be of immediate value to him upon graduation. The foundation which the student acquires in college should be supplemented by continual professional study, especially during those years immediately following graduation, when it is desirable that he should acquire practical experience in the employ and under the guidance of capable and experienced members of the profession. Students are most urgently advised to acquire practical experience in an architect's office during the summer vacations of their college course.

Throughout the course the instruction by lectures, recitations and drafting-room practice is fully amplified and expanded by a free use of the equipment of the Department of Architecture. Within the department is housed a good working library of the standard architectural works and leading professional magazines, together with the collections of lantern slides and photographs, to all of which the student has free access. Placed about the amply lighted and well-equipped rooms of the department is a generous collection of plaster casts, including important examples of architectural fragments and ornament from historical monuments. On the walls of the drafting rooms, where they are constantly before the student, are hung selected examples from the department's collection of original drawings, including specimens of both academic and current professional work. From time to time this exhibit is changed.

At frequent intervals, representative men actually engaged in the practice of architecture and the allied arts and trades are invited to talk to and to advise the student. During the junior or senior year under the direction of and in company with a member of the departmental faculty, each student is expected to make a visit to one or more of the neighboring cities, thus enabling him to acquaint himself with the representative work of the profession as well as with the operations and processes involved in the conduct of allied professions and industries.

All drawings or designs made during the student's course are to become the property of the department, to be used or returned at the discretion of the faculty.

COURSES IN ARCHITECTURE

FOR UNDERGRADUATES

108. ARCHITECTURAL DRAWING I. Freshman year, first semester. Drafting room, six hours. Two semester credits. Professor Baker.

This course is outlined to give the student a thorough knowledge of the orders and of the fundamental elements of architectural forms. Throughout the course special attention is given to the development of a high standard of lettering and of draftsmanship. Text: Pierre Esquire's *Traite Elementaire d' Architecture Comprenant l'Etude Complete des Cinq Ordres.*

109. ARCHITECTURAL DRAWING II. Freshman year, second semester. Drafting room, six hours. Two semester credits. Prerequisite: Course 108. Professor Baker.

This is a continuation of Architectural Drawing I, and consists of simple applications of the forms studied in the previous course. In preparation for the courses in design, attention is given to simple architectural rendering.

111. FREE-HAND DRAWING I. Freshman year, first semester. Drafting room, six hours. Two semester credits. Mr. Dehner.

This course comprises the drawing of simple objects and groups as exercises in developing the powers of observation as well as in training the hand. Special attention is given to representations of the third dimension.

114. FREE-HAND DRAWING II. Freshman year, second semester. Drafting room, six hours. Two semester credits. Prerequisite: Arch. 111. Mr. Dehner.

This is an amplification and expansion of the principles taught in Free-hand Drawing I, as applied to architectural forms and architectural ornament. The work consists of drawing in charcoal or pencil from casts.

116. FREE-HAND DRAWING III. Sophomore year, first semester. Drafting room, six hours. Two semester credits. Prerequisite: Arch. 114. Mr. Dehner.

This is a continuation of Free-hand Drawing II, and consists of drawing from casts of architectural ornament and of the human figure, with occasional exercises in rapid sketching, both indoors and out.

117. FREE-HAND DRAWING IV. Sophomore year, second semester. Drafting room, six hours. Two semester credits. Prerequisite: Arch. 116. Mr. Dehner.

In this course Free-hand Drawing III is continued, with the addition of some work in water color.

118. FREE-HAND DRAWING V. Junior year, first semester. Drafting room, six hours. Two semester credits. Prerequisite: Arch. 117. Mr. Dehner.

This is a continuation of Free-hand Drawing III and IV, and consists of a more detailed study and rendering in charcoal of architectural ornament and the human figure. More attention is paid than in the previous course to rapid sketching in pencil and in pen and ink.

120. FREE-HAND DRAWING VI. Junior year, second semester. Drafting room, six hours. Two semester credits. Prerequisite: Arch. 118. Mr. Dehner.

In this course Free-hand Drawing V is continued, substituting additional work in water color for the pencil and pen and ink sketching.

121. FREE-HAND DRAWING VII. Senior year, first semester. Drafting room, six hours. Two semester credits. Prerequisite: Arch. 120. Mr. Dehner.

This is a continuation of Free-hand Drawing V and VI, but more time is devoted to the drawing, in various mediums, of the human figure.

123. FREE-HAND DRAWING VIII. Senior year, second semester. Drafting room, six hours. Two semester credits. Prerequisite: Arch. 121. Mr. Dehner.

This is a continuation of Free-hand Drawing VII, with the addition of some work in original composition.

128. PERSPECTIVE. Freshman year, first semester. Drafting room, three hours. One semester credit. To be taken simultaneously with Ap. Mech. 155 and Arch. 108. Assistant Professor Barr.

This course, consisting of drafting-room exercises and examinations, covers the study and practical application of the theory of perspective as related to architectural practice. In the latter part of the course drafting-room exercises are given to train the student to visualize, in perspective, objects represented in orthographic projection.

131. SHADES AND SHADOWS. Freshman year, second semester. Drafting room, three hours. One semester credit. Prerequisites: Ap. Mech. 155, and Arch. 108. To be taken simultaneously with Ap. Mech. 158 and Arch. 109. Assistant Professor Barr.

The course consists of a series of drafting-room exercises and examinations, applying the principles of descriptive geometry in casting conventional architectural shadows. In these exercises the student is required to give careful consideration to the elemental architectural forms and principles of rendering used in his study of this subject.

142. DESIGN I. Sophomore year, first semester. Drafting room, nine hours. Three semester credits. Prerequisites: Arch. 114, 128 and 131. Professor Baker and Assistant Professor Weigel.

This course is outlined to develop the student's understanding of architectural composition and his ability to present architectural conceptions, thus laying the foundation for his esthetic training. By means of problems in

original design, accompanied by a constant study and analysis of the best historical examples, the student is led to develop his sense of proportion and conception of beauty, at the same time acquiring through the training of hand and eye a facility in architectural composition and rendering. In this course each student receives individual instruction, accompanied by frequent criticisms of students' work before the entire class.

144. DESIGN II. Sophomore year, second semester. Drafting room, nine hours. Three semester credits. Prerequisite: Arch. 142. Professor Baker and Assistant Professor Weigel.

In this course Design I is continued.

145. DESIGN III. Junior year, first semester. Drafting room, fifteen hours. Five semester credits. Prerequisites: Arch. 117 and 144. Professor Baker.

This is a continuation of Design I and II. At frequent intervals during the year, time problems or rapid design sketches are required to test the student's development and to give him practice in clear and concise expression. It is also required that at least one problem be presented in perspective.

147. DESIGN IV. Junior year, second semester. Drafting room, fifteen hours. Five semester credits. Prerequisite: Arch. 145. Professor Baker.

In this course Design III is continued.

148. DESIGN V. Senior year, first semester. Drafting room, twenty-four hours. Eight semester credits. Prerequisites: Arch. 120 and 147. Professor Baker.

In this course Design IV is continued.

151. DESIGN VI. Senior year, second semester. Drafting room, twenty-four hours. Eight semester credits. Prerequisite: Arch. 148. Professor Baker.

In this course Design V is continued.

153. HISTORY OF ARCHITECTURE I. Sophomore year, first semester. Class work, two hours. Two semester credits. Prerequisite: Arch. 114. Assistant Professor Weigel.

This is a lecture and recitation course covering the history of architecture from the dawn of civilization to the end of the Roman Empire. Throughout the courses in the history of architecture the relation of architecture to the development of civilization is constantly emphasized. The lectures are given with the aid of lantern slides, and written papers, with sketches, are required of each student.

156. HISTORY OF ARCHITECTURE II. Sophomore year, second semester. Class work, two hours. Two semester credits. Prerequisite: Arch. 153. Assistant Professor Weigel.

This course continues History of Architecture I and covers the period from the end of the Roman Empire to the end of the Gothic period.

159. HISTORY OF ARCHITECTURE III. Junior year, first semester. Class work, two hours. Two semester credits. Prerequisites: Arch. 117 and 156. Assistant Professor Weigel.

This course continues History of Architecture II and covers the Italian and French Renaissance period.

161. HISTORY OF ARCHITECTURE IV. Junior year, second semester. Class work, two hours. Two semester credits. Prerequisite: Arch. 159. Assistant Professor Weigel.

This course continues History of Architecture III and finishes the Renaissance period to modern times.

180. HISTORY OF CIVILIZATION AND ART I. Senior year, first semester. Lectures, three hours. Two semester credits. Prerequisite: Arch. 161. Professor Baker.

This course comprises a survey of civilization from earliest history, laying

special emphasis on the Hellenistic, Roman, and Gothic periods, and tracing the economic, political, racial, and religious phases of history simultaneously with the artistic developments of each epoch. The course consists of lectures, recitations, written papers, and research, the accomplishment of which is greatly aided by a free use of lantern slides, photographs, and library references.

184. HISTORY OF CIVILIZATION AND ART II. Senior year, second semester. Lectures, three hours. Two semester credits. Prerequisite: Arch. 180. Professor Baker.

In this course History of Civilization and Art I is continued to the close of the Renaissance.

186. MECHANICAL EQUIPMENT. Junior year, first semester. Class work, two hours. Two semester credits. Prerequisite: Arch. 189. Assistant Professor Weigel.

This is a course dealing with the heating, ventilating, plumbing, and electrical installations of modern buildings. The work covers the fundamental principles of each type of installation, together with practical problems in their application to buildings.

187. BUILDING MATERIALS AND CONSTRUCTION I. Sophomore year, first semester. Class work, one hour; drafting room, six hours. Three semester credits. Prerequisite: Arch. 109. To be taken simultaneously with Arch. 142. Assistant Professor Weigel.

This course takes up the study of the properties and uses of the materials of construction. Attention is also given to the properties of these materials in their relation to design. Working drawings involving various materials and types of construction are executed in the drafting period, covering the same field that is studied in the classroom work. Specifications to accompany the working drawings are also required. Occasional visits to buildings under construction are made, to familiarize the student with various forms of construction and with the methods employed in building operations.

189. BUILDING MATERIALS AND CONSTRUCTION II. Sophomore year, second semester. Class work, one hour; drafting room, six hours. Three semester credits. Prerequisite: Arch. 187. Assistant Professor Weigel.

This is a continuation of Building Materials and Construction I.

192. THEORY OF STRUCTURES I. Junior year, first semester. Class work, one hour; drafting room, nine hours. Four semester credits. Prerequisite: Arch. 189. Must be taken simultaneously with or subsequent to Ap. Mech. 102. Assistant Professor Barr.

This course covers the study of the simple design and the various methods of framing wooden structures.

194. THEORY OF STRUCTURES II. Junior year, second semester. Class work, one hour; drafting room, six hours. Three semester credits. Prerequisite: Arch. 192. Must be taken simultaneously with or subsequent to Ap. Mech. 116, 121. Assistant Professor Barr.

This course comprises the study of the general principles of building design with both the algebraic and graphic solutions of these principles.

196. STRUCTURAL DESIGN I. Senior year, first semester. Class work, one hour; drafting room, six hours. Three semester credits. Prerequisite: Arch. 194. Assistant Professor Barr.

This course covers the solution of problems in modern steel construction, giving special attention to their relation to other building materials.

198. STRUCTURAL DESIGN II. Senior year, second semester. Class work, one hour; drafting room, six hours. Three semester credits. Prerequisite: Arch. 196. Assistant Professor Barr.

This course is a continuation of Structural Design I, and deals more specifically with reinforced concrete design.

FOR GRADUATES

301. ADVANCED DESIGN I. Elective, first semester. Drafting room, thirty hours. Ten semester credits. Professor Baker.

In this course a study of the planning of important buildings and groups of buildings is made, together with occasional rapid-sketch problems of minor buildings or plan projects.

304. ADVANCED DESIGN II. Elective, second semester. Drafting room, thirty hours. Ten semester credits. Professor Baker.

This is a continuation of Advanced Design I.

308. ADVANCED FREE-HAND DRAWING I. Elective, first semester. Drafting room, six hours. Two semester credits. Professor Baker.

This course includes the study of the human figure and exercises in original composition of architectural ornament. Work is done in various mediums.

312. ADVANCED FREE-HAND DRAWING II. Elective, second semester. Drafting room, six hours. Two semester credits. Professor Baker.

This is a continuation of Advanced Free-hand Drawing I.

316. ADVANCED HISTORY OF CIVILIZATION AND ART I. Elective, first semester. Class work, two hours. Two semester credits. Professor Baker.

This course comprises a survey of civilization from the Roman Empire to the present time, tracing the economic, political, racial, and religious phases of history simultaneously with the artistic developments of each epoch. Instruction is by means of lectures, recitations, written papers, and research.

320. ADVANCED HISTORY OF CIVILIZATION AND ART II. Elective, second semester. Class work, two hours. Two semester credits. Professor Baker.

This is a continuation of Advanced History of Civilization and Art I.

324. RESEARCH IN ARCHITECTURE. Elective, first and second semesters. Drafting-room or class work. Credit as determined by Professor Baker and Graduate Council.

This course comprises the study of a research problem in architecture, determined by conferences between Professor Baker and the student, and approved by the Graduate Council.

Civil Engineering

Professor CONRAD
Associate Professor FRAZIER
Assistant Professor FURR
Assistant Professor WHITE
Instructor TODD

The purpose of the instruction in the Department of Civil Engineering is to give the student a thorough knowledge of the fundamental principles of engineering and to develop his ability to analyze engineering problems, and thus prepare the graduate to enter any one of the many special fields which are usually included under the title of civil engineering.

In addition to the laboratory equipment of the other engineering departments, which is available to civil-engineering students, the Department of Civil Engineering possesses a good assortment of transits, levels, plane tables, compasses, tapes and chains. It also owns a precise level, a direction theodolite, a repeating theodolite, four different kinds of solar attachments, and a base-line outfit.

Approximately 90 per cent of the graduates of this department are now engaged in engineering work in cities, in the oil fields, in the government reclamation and valuation service, in consulting engineering, in highway work, in construction work, and in other work in which civil engineering is a prerequisite.

COURSES IN CIVIL ENGINEERING

FOR UNDERGRADUATES

102. SURVEYING I. Freshman year, both semesters. Field work, plotting, and supervised study, six hours. Two semester credits. Prerequisite or parallel: Plane Trigonometry (Math. 101). Associate Professor Frazier, Assistant Professors Furr and White, and Mr. Todd.

This is a brief course in the use and care of engineers' surveying instruments. Text: Breed and Hosmer's *Surveying,* Vol. I.

111. SURVEYING II. Freshman year, both semesters. Field work, plotting and supervised study, six hours. Two semester credits. Prerequisite: Surveying I. Assistant Professors Furr and White.

The course is devoted to land and topographic surveying. Text: Breed and Hosmer's *Surveying,* Vol. I.

120. MASONRY AND FOUNDATIONS. Junior year, first semester. Class work, two hours. Two semester credits. Prerequisite: Engineering Physics II (Physics 150); Applied Mechanics I (Ap. Mech. 101, 105) must be taken with this course or precede it. Associate Professor Frazier.

In this course a study is made of the principles underlying the design and construction of foundations, the stresses in plain masonry structures, and the method of designing such structures. Text: Baker's *Treatise on Masonry Construction.*

125. CIVIL ENGINEERING DRAWING I. Sophomore year, second semester. Drafting room, six hours. Two semester credits. Prerequisite: Mechanical Drawing I (Ap. Mech. 160, 165.) Associate Professor Frazier.

This course is devoted to the application of stereotomy, shades and shadows, isometric and perspective drawing, and copying working drawings of engineering structures. The principles are explained to the students by such short lectures as seem necessary for the purpose. No textbook is used.

145. RAILWAY ENGINEERING I. Junior year, second semester. Class work, two hours. Two semester credits. Prerequisites: Surveying IV and Civil Engineering Drawing I (Civ. Engr. 111, 125). Associate Professor Frazier.

This is a short course in the theory of railway engineering based on Wellington's economic theory. Considerable time is also devoted to the study of track construction and maintenance, and to the design of yards and terminals. Text: Raymond's *Elements of Railroad Engineering.*

151. SURVEYING III RECITATION. Sophomore year, first semester. Class work, two hours. Two semester credits. Prerequisite: Surveying II. Assistant Professor Furr.

This course comprises a study of topographic, hydrographic, city, and mine surveying. Text: Breed and Hosmer's *Surveying,* Vols. I and II.

155. SURVEYING III LABORATORY. Sophomore year, first semester. Field and drafting-room work, three hours. One semester credit. Prerequisite: Surveying II Laboratory. Assistant Professor Furr.

The field exercises are devoted to practice work in topographic surveying. Time in the drafting room is devoted principally to topographic mapping. Texts: Same as in Civ. Engr. 151.

156. SURVEYING IV RECITATION. Sophomore year, second semester. Class work, two hours. Two semester credits. Prerequisite: Surveying III. Assistant Professor Furr.

This course is devoted to a study of railroad curves and earthwork. Text: Allen's *Railroad Curves and Earthwork,* with tables.

157. SURVEYING IV LABORATORY. Sophomore year, second semester. Field and drawing room, three hours. One semester credit. Prerequisite: Surveying III. Assistant Professor Furr.

The time is devoted to field and drafting room exercises in railroad curves and earthwork.

161. DRAINAGE AND IRRIGATION I. Junior year, second semester. Class work, two hours. Two semester credits. Hydraulics (Ap. Mech. 130) must be taken with this course or precede it. Professor Conrad.

In this course a study is made of the application of engineering principles to the design and construction of drainage and irrigation works. Considerable attention is paid to the development of ground-water supplies for irrigation. Texts: Elliott's *Engineering for Land Drainage,* and Davis and Wilson's *Irrigation Engineering.*

170. THESIS. Senior year, continuing through both semesters. First semester, three hours; one semester credit. Second semester, six hours; two semester credits. Professor Conrad.

All candidates for the degree of Bachelor of Science in civil engineering are required during their senior year, to prepare a thesis, or to do an equivalent amount of work in an elective subject approved by the dean of engineering. This thesis may be a report on a proposed design, an original investigation, or a library research. Civil engineering students may, with the approval of the head of the department, take their thesis work outside of the department. The thesis subject may be selected and approved by the head of the department in which the work is done before October first next preceding the commencement at which the candidate proposes to graduate.

FOR GRADUATES AND UNDERGRADUATES

201. BRIDGE STRESSES. Senior year, first semester. Class work, four hours. Four semester credits. Prerequisite: Strength of Materials (Ap. Mech. 110). Professor Conrad.

This course involves a study of the methods of computing the stresses in bridges, leading up to the subject of bridge design in the following semester. Text: Ketchum's *Design of Highway Bridges.*

205. CIVIL ENGINEERING DRAWING II. Senior year, first semester. Drafting room, six hours. Two semester credits. Prerequisite: Civil Engineering Drawing I (Civ. Engr. 125). Professor Conrad.

This course is devoted to graphic statics and the design of simple roof trusses in timber and steel. Text: Same as for course 201.

211. ASTRONOMY AND GEODESY RECITATION. Senior year, first semester. Class work, two hours. Two semester credits. Prerequisite: Surveying III. Associate Professor Frazier.

This is a brief course in the elements of practical astronomy, followed by a study of the precise methods of surveying and leveling. Text: Ingram's *Geodetic Surveying.*

216. ASTRONOMY AND GEODESY LABORATORY. Senior year, first semester. Field work, six hours. Two semester credits. Prerequisite: Surveying III Laboratory. Associate Professor Frazier.

The work is devoted to simple astronomical observations, principally for determining the true meridian and latitude; to base-line measurements and triangulation work. Each student is also required to run a short circuit with the precise level.

220. WATER SUPPLY. Senior year, first semester. Class work, two hours. Two semester credits. Prerequisite: Hydraulics (Ap. Mech. 130). Associate Professor Frazier.

The course deals with the water supply for cities from the standpoints of consumption, collection, storage, distribution, and purification.

225. SEWERAGE. Senior year, first semester. Class work, two hours. Two semester credits. Prerequisite: Hydraulics (Ap. Mech. 130). Associate Professor Frazier.

A study is made of the problems met in the design and construction of sewer systems and disposal plants for cities of moderate size.

230. HIGHWAY ENGINEERING I RECITATION. Senior year, first semester. Class work, two hours. Two semester credits. Prerequisite: Applied Mechanics II (Ap. Mech. 110). Assistant Professor Furr.

A study is made of the principles underlying the location, construction, and maintenance of all ordinary types of roads and pavements. Text: Agg's *Construction of Roads and Pavements.* (For the laboratory work in connection with this course, see Ap. Mech. 250.)

246. BRIDGE DESIGN. Senior year, second semester. Drawing, nine hours. Three semester credits. Prerequisite: Bridge Stresses (Civ. Engr. 201). Professor Conrad.

This course comprises the making of general drawings for a highway truss bridge, a railroad truss bridge, and a railroad deck plate girder. Text: Ketchum's *Structural Engineers' Handbook.*

250. CONCRETE DESIGN RECITATION. Senior year, second semester. Class work, two hours. Two semester credits. Prerequisite: Strength of Materials (Ap. Mech. 110). Professor Conrad.

An application of the principles of reinforced concrete to the design of chimneys, buildings, retaining walls, dams, and bridges. Text: *Concrete Engineers' Handbook,* by Hool and Johnson.

255. CONCRETE DESIGN LABORATORY. Senior year, second semester. Drafting-room work, three hours. One semester credit. Prerequisite: Strength of Materials (Ap. Mech. 110). Professor Conrad.

In this course the students make drawings of reinforced concrete retaining walls, dams, slab-bridges and girder bridges. Text: *Concrete Engineers' Handbook,* by Hool and Johnson.

260. RAILWAY ENGINEERING II RECITATION. Optional, senior year, second semester. Class work, two hours. Two semester credits. Prerequisite: Railway Engineering I (Civ. Engr. 145). Associate Professor Frazier.

This course comprises the study of railway operation and maintenance.

265. RAILWAY ENGINEERING II LABORATORY. Optional, senior year, second semester. Field and drafting room, six hours. Two semester credits. Prerequisite: Railway Engineering I (Civ. Engr. 145). Associate Professor Frazier.

In the field, reconnoissance and survey of a short railroad is made, and the office work consists in making the maps, profiles, and estimates from the survey. Text: Allen's *Railroad Curves and Earthwork,* with tables.

270. HIGHWAY ENGINEERING II RECITATION. Optional, senior year, second semester. Class work, two hours. Two semester credits. Prerequisite: Highway Engineering I (Civ. Engr. 230). Assistant Professor Furr.

This course consists in a study of highway laws, highway administration in the various states, and highway economics.

275. HIGHWAY ENGINEERING II LABORATORY. Optional, senior year, second semester. Field and drafting room, six hours. Two semester credits. Prerequisite: Highway Engineering I (Civ. Engr. 230). Assistant Professor Furr.

In the field, a reconnoissance and survey for a highway a few miles long is made. The work in the drafting room consists in making the maps, profiles, and estimates from the survey.

280. DRAINAGE AND IRRIGATION II RECITATION. Optional, senior year, second semester. Class work, two hours. Two semester credits. Prerequisite: Drainage and Irrigation I. Professor Conrad.

A continuation of the former course in Drainage and Irrigation, dealing with the design of irrigation structures and the management of irrigation projects.

285. DRAINAGE AND IRRIGATION II LABORATORY. Optional, senior year, second semester. Field and drafting room, six hours. Two semester credits. Professor Conrad.

The field work consists in making the survey for a drainage or irrigation project. In the office the maps, estimates, and designs are made, using the survey as a basis.

FOR GRADUATES

301. ADVANCED BRIDGE STRESSES. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Bridge Stresses. Professor Conrad.

A study of deflections; stresses in continuous, movable, cantilever, suspension, multiple intersection, and steel arch bridges; and secondary stresses.

306. REINFORCED CONCRETE ARCHES. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Concrete Design. Professor Conrad.

A study of the various types of reinforced-concrete arches adapted for use in bridges, buildings and dams, including the computation of stresses and arrangement of details.

311. HIGHWAY ECONOMICS. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Highway Engineering II. Associate Professor Furr.

A study of highway transport and construction problems as affected by recent findings of research agencies in this field.

316. RAILROAD TRANSPORTATION. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Railroad Engineering I. Associate Professor Frazier.

A study of the function of the railroad system; its relation to industrial development and its correlation with other methods of transportation.

Electrical Engineering

Professor REID
Associate Professor KLOEFFLER
Assistant Professor BRENNEMAN
Instructor BECKWITH
Instructor PALMER

Instruction in the Department of Electrical Engineering is planned to give the student a thorough training in the underlying principles of electrical phenomena, direct and alternating current, and in the application of electrical theory to the solution of the practical problems in the many fields of the industry. The textbook, lecture and classroom instruction is accompanied by extended courses in the laboratories, which include commercial tests on standard types of machinery and also special tests designed to exemplify the theory.

The laboratories include a measurement laboratory, well equipped with standards of resistance, electromotive force, self-induction and capacity, and with standard instruments of high precision of both American and foreign manufacture.

The telephone laboratory is unusually well supplied with several demonstration panels of and switchboards for magneto, common battery (manual) and automatic telephone systems, and a large supply of telephone instruments and parts for assembling complete circuits.

An illumination laboratory is furnished with many lighting circuits and samples of various types of fixtures for test and comparison.

The main dynamo laboratory contains examples of all types of electrical machinery and control apparatus, including more than 50 direct- and alternating-current generators and motors, from 1 to 30 kilowatts and totaling more than 450 horsepower. The instrument room in connection contains more than 100 instruments of more than 250 ranges for the measurement of current, voltage, power, frequency and other electrical quantities. The dynamo laboratory also includes a complete electric-railway test set, consisting of two modern railway motors, geared to a load and controlled by a complete H-L type control equipment.

In addition, there is a repair shop for the department; a repair laboratory for instruction in armature winding and dynamo and apparatus repair; and a wiring laboratory for the freshman course, in which sixteen booths or rooms, in imitation of buildings both finished and in process of construction, and a complete list of supplies for cleat, concealed knob and tube, conduit, and condulet construction afford students actual practice in wiring buildings by the commonly used methods.

COURSES IN ELECTRICAL ENGINEERING

FOR UNDERGRADUATES

101. DIRECT-CURRENT MACHINES I RECITATION. Junior year, first semester. Recitations or lectures, three hours. Three semester credits. Prerequisites: Calculus I (Math. 113) and Engineering Physics II (Physics 150). Assistant Professor Brenneman.

The work consists of a detailed study of the fundamental principles of magnetic and electric circuits and their application to the various types of direct-current machines. Numerous problems involving the application of the principles are given as a part of the course. The class work is planned to coordinate with the work in the electrical engineering laboratory. Text: Langsdorf's *Principles of Direct-current Machines.*

105. DIRECT-CURRENT MACHINES I LABORATORY. Junior year, first semester. Laboratory work, three hours. One semester credit. This course should accompany or follow Direct-current Machines I Recitation. Assistant Professor Brenneman.

A series of experiments is outlined which is designed to necessitate careful, accurate measurement. The student is obliged to make all electrical connections with the necessary instruments in the circuit, and to record the required data. From the laboratory records a written report upon each experiment or test must be submitted. The laboratory exercises include tests for armature and field resistance, potential curves, machine characteristics, motor and generator efficiencies. Text: Swenson and Frankenfield's *Testing of Electromagnetic Machinery,* Vol. I.

111. DIRECT-CURRENT MACHINES II RECITATION. Junior year, second semester. Lectures or recitations, two hours. Two semester credits. Prerequisites: Direct-current Machines I, and Electrical Measurements. Assistant Professor Brenneman.

This course is a continuation of Direct-current Machines I. It involves a detailed study of the various types of direct-current machinery with respect to theory and operation. Text: Langsdorf's *Principles of Direct-current Machines.*

The latter part of the course is devoted to a study of the construction and testing of the various types of voltmeters, ammeters, wattmeters, and watt-hour meters. Text: Jansky's *Electrical Meters.*

115. DIRECT-CURRENT MACHINES II LABORATORY. Junior year, second semester. Laboratory work, three hours. One semester credit. This course should accompany or follow Direct-current Machines II Recitation. Associate Professor Kloeffler.

Special attention is given in this course to the different methods of determining generator and motor efficiencies and to the proper tabulation and interpretation of results. The latter part of the course is devoted to the calibration of electrical instruments. Text: Swenson and Frankenfield's *Testing of Electromagnetic Machinery,* Vol. I.

122. ELECTRICAL MEASUREMENTS RECITATION. Junior year, first semester. Lectures and recitations, two hours. Two semester credits. Prerequisites: Calculus I (Math. 113) and Engineering Physics II (Physics 150). Associate Professor Kloeffler.

This course is an extension of the work in electricity in Engineering Physics II. It treats of the various methods for the measurement of resistance, current, electromotive force, capacity, and inductance. Text: A. W. Smith's *Principles of Electrical Measurements.*

126. ELECTRICAL MEASUREMENTS LABORATORY. Junior year, first semester. Laboratory work, three hours. One semester credit. This course should accompany or follow Electrical Measurements Recitation. Associate Professor Kloeffler.

The laboratory course follows the work of the classroom by giving applications of the fundamental principles studied.

130. ELECTRICAL ENGINEERING M-I RECITATION. Senior year, first semester. Lectures or recitations, three hours. Three semester credits. Prerequisites: Engineering Physics II (Physics 150) and Calculus I (Math. 113). Assistant Professor Brenneman.

This course covers the subject of direct-current machines with reference to the fundamental laws of the electric circuit, the principles of direct-current machinery, and the more important commercial tests. Text: Bailey's *Dynamo-Electric Machinery.*

135. ELECTRICAL ENGINEERING M-I LABORATORY. Senior year, first semester. Laboratory, three hours. One semester credit. This course should accompany or follow Electrical Engineering M-I Recitation. Assistant Professor Brenneman.

Practice is given in the proper use of electrical measuring instruments. The experiments include a variety of tests requiring accurate observation, and a knowledge of the theory of dynamo machines. The various standard characteristics and efficiency tests are given. A written report on each test is required.

140. ELECTRICAL ENGINEERING M-II RECITATION. Senior year, second semester. Lectures and recitations, three hours. Three semester credits. Prerequisite: Electrical Engineering M-I. Assistant Professor Brenneman.

The work covers briefly the important principles of alternating-current phenomena. The leading types of alternating-current machinery and apparatus are discussed with reference to their operation and their adaptability to different classes of service. Text: Bailey's *Dynamo-Electric Machinery.*

145. ELECTRICAL ENGINEERING M-II LABORATORY. Senior year, second semester. Laboratory work, three hours. One semester credit. Assistant Professor Brenneman.

This course includes practice in the use of alternating-current instruments; standard tests of alternators, motors, and transformers; and methods of operating the different types of alternating-current machinery.

150. ELECTRICAL MACHINE DESIGN I. Senior year, first semester. Laboratory work, three hours. One semester credit. Prerequisite: Direct-current Machines II. Associate Professor Kloeffler.

The purpose of the course is to acquaint the student with the principles of commercial design of direct-current machinery. Each student is required to make the necessary calculations and drawings for a direct-current generator. Text: Gray's *Electrical Machine Design.*

155. ELECTRICAL MACHINE DESIGN II. Senior year, second semester. Laboratory, six hours. Two semester credits. Prerequisites: Alternating-current Machines II and Electrical Machine Design I. Associate Professor Kloeffler.

This is a continuation of Electrical Machine Design I. Drawings are made from the direct-current generator previously calculated. A study is made of the principles of alternating-current design as applied to transformers, and each student makes the necessary design calculations for a transformer.

160. ELECTRICAL ENGINEERING C RECITATION. Senior year, second semester. Recitations or lectures, two hours. Two semester credits. Prerequisite: College Physics. Mr. Beckwith.

This work is designed to cover briefly the fundamental principles of direct-current and alternating-current electricity. Emphasis is laid upon the proper installation and operation of the different classes of machines and the use of electricity for lighting and power. Text: Bailey's *Dynamo-Electric Machinery*.

165. ELECTRICAL ENGINEERING C LABORATORY. Senior year, second semester. Laboratory work, three hours. One semester credit. Mr. Beckwith.

The laboratory practice is designed to give the student a knowledge of the most important commercial tests. The proper use of electrical instruments is emphasized. A written report of each laboratory test is required. Text: Wilson's *Dynamo Laboratory Outlines*.

170. ELECTRICAL MACHINERY AND CONSTRUCTION. Freshman year, first and second semesters. Laboratory work, six hours. Two semester credits. Professor Reid, Mr. Beckwith and Mr. Palmer.

This is an introductory course in applied electricity. About one-half the time is devoted to acquainting the student with the various modern methods of interior wiring, approved by the National Board of Fire Underwriters, including open, cleat wiring, knob and tube-concealed wiring, flexible and rigid iron-pipe conduit, and metal molding. The wiring "code" is used as a reference in this part of the course, and on its completion the student should be competent to plan, lay out and install the wiring for the usual residence or business building.

The remainder of the time is devoted to the installation, care, operation, and repair of electrical machinery. It includes armature winding of direct- and alternating-current motors and generators; the diagnosis and location of faults—short circuits, open circuits, grounds—and the repair of these various types of electrical-machine troubles. It also includes the installation and connection of motors, generators, meters, compensators, and other of the usual types of electrical apparatus. Texts: Croft's *Wiring for Light and Power*, Timbie's *Essentials of Electricity*.

195. THESIS. Senior year, continuing through both semesters. First semester: three hours; one semester credit. Second semester: six hours; two semester credits. Professor Reid, Associate Professor Kloeffler, Assistant Professor Brenneman, Mr. Beckwith and Mr. Palmer.

The subject for thesis work is selected in consultation with the head of the department, at the beginning of the first semester of the senior year. The work is continued during the second semester. Every opportunity is given the student to work out original ideas as to design and operation of electrical apparatus and machinery.

FOR GRADUATES AND UNDERGRADUATES

201. ALTERNATING-CURRENT MACHINES I RECITATION. Junior year, second semester. Recitations or lectures, two hours. Two semester credits. Prerequisites: Calculus II (Math. 116) and Direct-current Machines I. Professor Reid.

The work consists of a mathematical treatment of alternating-current phenomena. A study is made of the vector method of treating alternating-current problems. The solution of problems involving single and polyphase circuits forms an important part of the course. Text: Timbie and Higbie's *Alternating-current Electricity and Its Application to Industry*.

205. ALTERNATING-CURRENT MACHINES I LABORATORY. Junior year, second semester. Laboratory work, three hours. One semester credit. This course should accompany or follow Alternating-current Machines I Recitation. Mr. Beckwith.

It is the aim of this course to provide a series of experiments illustrating the theoretical work of the lecture room. Practice is given in the accurate measurement of capacity and inductance, and the effect of each upon the circuit. The latter part of the course is devoted to a study of polyphase circuits.

210. ALTERNATING-CURRENT MACHINES II RECITATION. Senior year, first semester. Recitations or lectures, four hours. Four semester credits. Prerequisite: Alternating-current Machines I. Professor Reid.

This is a continuation of Alternating-current Machines I. The course consists of a study of the theory of alternating-current machinery, alternators, synchronous motors, induction motors, transformers, and the various devices used in connection with alternating-current work. A study is also made of the application of the different types of machinery to industrial uses. Text: Franklin and Estey's *Elements of Electrical Engineering,* Vol. II.

215. ALTERNATING-CURRENT MACHINES II LABORATORY. Senior year, first semester. Laboratory work, six hours. Two semester credits. This course should accompany or follow Alternating-current Machines II Recitation. Professor Reid, Mr. Beckwith and Mr. Palmer.

A series of experiments involving special and commercial tests of alternators, synchronous motors, transformers, and the different types of alternating-current machinery and apparatus, are carried out.

220. TELEPHONY RECITATION. Senior year, first semester. Class work, two hours. Two semester credits. Prerequisites: Direct-current Machines I, and Alternating-current Machines II. Associate Professor Kloeffler.

This course covers the principles of telephonic communication. A careful study is made of telephone apparatus and circuits used on magneto, common battery (manual) and automatic systems. Some time is devoted to the general problem of testing, maintenance, construction, and operation of telephone systems.

225. TELEPHONY LABORATORY. Senior year, first semester. Laboratory, three hours. One semester credit. This course should accompany or follow Telephony Recitation. Associate Professor Kloeffler.

This course includes the study and measurement of telephone parts, the actual wiring of telephone circuits on the magneto, common battery and automatic systems, location of line trouble, and transmission efficiency tests on various types of apparatus and circuits.

235, 236. ILLUMINATING ENGINEERING. Senior year, second semester. Lectures and recitation, two hours; laboratory, three hours. Three semester credits. Prerequisites: Calculus II (Math. 116) and Engineering Physics II (Physics 150). Associate Professor Kloeffler.

This course is devoted to a study of photometry light standards, the principles of illumination, and illumination design. Each student is required to design the illumination of some shop, residence, or public building. Texts: Croft's *Practical Electric Illumination,* and bulletins of the National Lamp Works.

240. ELECTRIC RAILWAYS. Senior year, second semester. Recitations or lectures, two hours. Two semester credits. Prerequisite: Alternating-current Machines II. Mr. Palmer.

A study is made of the development of electric traction; traffic conditions and train schedules; speed-time curves; power generation and distribution for electric railways signal systems; types of cars and locomotives in use; various control systems; and adaptability of electric traction to steam road. Text: Harding's *Electric Railway Engineering.*

245. STORAGE BATTERY ENGINEERING. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisites: Chemistry and Physics. Knowledge of generators will be valuable. Assistant Professor Brenneman.

This course includes a study of process of manufacture, molecular and chemical theory of operation, behavior on charge and discharge, rating and life of a battery; battery diseases, their causes, methods of recognition, and remedies; methods of charge and discharge; and features of batteries that determine their adaptability to central stations, farm lighting service and gas and electric vehicles. Attention is given to the features of each application

that are most likely to cause the various troubles. Text: Lyndon's *Storage Battery Engineering,* with other books for reference on automobile practice.

250. COMMERCIAL ENGINEERING. Elective, first or second semester. Class work, two hours. Two semester credits. Prerequisite: Economics. Associate Professor Kloeffler.

This course develops the relation of the engineer to commercial life. It covers the work of the sales engineer and the routine of an order through an industrial concern. It likewise includes the principles of salesmanship as applied to the selling of materials and apparatus, plans and services.

255. ELECTRIC HEATING. Elective, first or second semester. Class work, two hours. Two semester credits. Prerequisite: Direct-current Machines I. Associate Professor Kloeffler.

This course covers the theory and practice of electricity as applied to cooking, room heating, japanning ovens, spot welding, arc welding, and the various types of electric arc and induction furnaces.

260. INDUSTRIAL ELECTRICAL APPLICATIONS. For advanced students in courses other than electrical engineering. Elective, first or second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Electrical Engineering M-II. Professor Reid.

The course comprises a study of the principal types of electrical machinery and apparatus encountered in practice, and the transmission and distribution of electric power for industrial purposes, including electric motor drive, electric lighting and electric heating in industrial plants. Choice of equipment for performing specified duties is discussed.

FOR GRADUATES

306. ADVANCED ELECTRICAL MACHINE DESIGN. Elective, first or second semester. Two or four semester credits. Prerequisites: Alternating-current Machines II and Electrical Machine Design II. Associate Professor Kloeffler and Assistant Professor Brenneman.

The theory and general problems in the design of power transformers for various applications is covered, and two specific power-transformer designs are made by each student. In the induction-motor design attention is given to problems of design introduced by coil spread, coil pitch, slot and tooth proportions, primary and secondary slot members, poles, and frequency, as these affect losses, exciting current, power factor, and maximum torque.

311. SYMBOLIC NOTATION IN ELECTRICITY. Elective, first or second semester. Class work, two hours. Two semester credits. Prerequisite: Alternating-current Machines II. Assistant Professor Brenneman.

In this course use is made of the vector methods in solving alternating-current problems. Single-phase, balanced or unbalanced three-phase problems in net works are solved; computations of real and reactive power on the reverse are handled by symbolic notation. Problems are illustrated by the corresponding vector diagram.

316. TRANSIENT ELECTRICAL PHENOMENA. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisites: Alternating-current Machines II, Symbolic Notation in Electricity, and Differential Equations. Assistant Professor Brenneman.

In this course two phases of electrical phenomena are discussed, namely:

(*a*) Transients in time: Condensers and inductances in direct- and alternating-current circuits at time of make or break of circuit; transient conditions in divided circuits; transient conditions during short circuit of generators; connecting induction motors and transformers to a line.

(*b*) Transients in space: Current and voltage relations along a transmission line; distribution of current density throughout body of magnetic and nonmagnetic conductors; rate of flux penetration.

Text: Steinmetz, *Transient Electrical Phenomena.*

321. ADVANCED TELEPHONY. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Telephony. Associate Professor Kloeffler.

This is an advanced course dealing with some of the most recent phases of telephone engineering. It includes types of equipment, circuits, and methods of trunking in the Strowger automatic and the machine-switching systems, and the theory and application of telephone repeaters and carrier currents used in toll practice.

326. ADVANCED ILLUMINATION. Elective, first or second semester. Class work, two hours. Two semester credits. Prerequisite: Illumination Engineering. Associate Professor Kloeffler.

A study is made of the lighting systems adapted for the illumination of stores, offices, drafting rooms, machine shops, railway shops, hospitals and city streets. Two specific designs are required of each student.

331. GENERATION, TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Alternating-current Machines II. Professor Reid.

This course is designed to cover selection of equipment for power houses and substations, station operation and management, and problems of power transmission and systems of distribution, including electrical, mechanical and economic calculations for low-, medium- and high-potential systems.

336. ELECTRICAL ENGINEERING RESEARCH. Elective, first or second semester. One semester credit for each three hours laboratory. Prerequisite: Alternating-current Machines II. Professor Reid.

An advanced laboratory course intended as an introduction to more elaborate work of special investigation. The course will be adapted to meet the needs and attainments of individual students. Particular problems will be assigned which must be studied by reference to existing literature and by experimental work, and on which completed reports must be submitted.

General Engineering

Dean SEATON

101. ENGINEERING LECTURES. Freshman year, continuing through both semesters. Lectures, one hour a week. Dean Seaton, other members of the engineering faculty, and visiting practicing engineers.

These lectures are designed to acquaint students who are beginning the study of engineering and architecture with the fundamental principles of their profession and to give them a general survey of the field of engineering.

105. SEMINAR. Sophomore, junior, and senior years. Required throughout each year. Lectures, papers, and discussions, one hour a week. Members of the engineering faculty.

This work differs for the various curricula, and as far as possible is conducted by the student branches of the professional engineering societies. In the case of electrical engineering students the work is conducted by the student branch of the American Institute of Electrical Engineers; the student branch of the American Society of Mechanical Engineers has charge of the work for students in mechanical and flour-mill engineering; the Kansas State Agricultural College Civil Engineering Society and the Architects' Club conduct the seminars for students in civil engineering and architecture, respectively; the student branch of the American Society of Agricultural Engineers conducts the work for students in agricultural engineering. Students are required to present abstracts and reviews of articles appearing in the journals of their respective societies or in the technical press of their profession or to prepare original articles. Occasionally these individual groups unite in the general Engineering Society, under whose auspices lectures are given by practicing engineers and by members of the engineering and College Faculty on topics of general interest to engineering students.

Mechanical Engineering

Professor CALDERWOOD
Assistant Professor MACK
Instructor BRADLEY

The object of the instruction in this department is to give to the student the fundamental principles underlying the design, construction, selection, operation and testing of steam boilers; steam engines; and steam turbines; gas producers; gas and petroleum engines; compressed-air and refrigerating machinery; condensers and evaporators. These subjects are developed by courses in engineering thermodynamics and in steam and gas engineering, and are followed in the fourth year by courses in power-plant engineering, in refrigeration, and in heating and ventilation. The classroom instruction of every course consists of lectures and recitations, which are paralleled by work in the drafting-room and laboratory, and supplemented by numerous practical problems, trade catalogues, notes, and inspection trips requiring written reports.

MECHANICAL ENGINEERING LABORATORY

The mechanical-engineering laboratories are well equipped for the testing of boilers, steam engines, gas engines, refrigeration machinery, fuels, lubricants, and other equipment and materials met with in the practice of mechanical engineering. In addition to the equipment installed especially for experimental purposes, all the heating, power, ventilating, and pumping equipment of the College subserves the further purpose of experimental work.

COURSES IN MECHANICAL ENGINEERING

FOR UNDERGRADUATES

101. STEAM AND GAS ENGINEERING I RECITATION. Junior and senior years, first semester. Lectures and recitations, four hours. Four semester credits. Prerequisites: Mechanism (Ap. Mech. 180) and Calculus II (Math. 116). Professor Calderwood, Assistant Professor Mack, and Mr. Bradley.

This is a study of heat-power engineering, including valve gears and thermodynamics. Special stress is put upon the theory of the thermodynamics of gases and vapors, and gas and vapor cycles. Texts: Fessenden's *Valve Gears;* and Moyer, Calderwood, and Potter's *Elements of Engineering Thermodynamics.*

105. STEAM AND GAS ENGINEERING I LABORATORY. Junior and senior years, first semester. Laboratory, three hours. One semester credit. Taken with Steam and Gas Engineering I Recitation. Professor Calderwood, Assistant Professor Mack, and Mr. Bradley.

The study and calibration of steam gauges, indicators, and planimeters; valve-setting and steam-engine operations; study of calorimeters, flow meters, and feed-water heaters; determination of the indicated and brake horsepower, mechanical efficiency, and the steam consumption of high-speed automatic cut-off, Corliss, simple and compound engines; tests of DeLaval, Kerr and Terry steam turbines are included in this course. Text: Carpenter and Diederchs' *Experimental Engineering* is used in this and subsequent laboratory courses.

110. STEAM AND GAS ENGINEERING II RECITATION. Junior and senior years, second semester. Lectures and recitations, three hours. Three semester credits. Prerequisite: Steam and Gas Engineering I. Professor Calderwood, Assistant Professor Mack, and Mr. Bradley.

This is a continuation of the study of heat-power engineering and includes a detailed study of steam engines, steam boilers, steam turbines, internal combustion engines, fuels and combustion, gas producers, and other power-plant equipment. Text: Gebhardt's *Steam Power Plant Engineering.*

115. STEAM AND GAS ENGINEERING II LABORATORY. Junior and senior years, second semester. Laboratory, three hours. One semester credit. Taken with

Steam and Gas Engineering II Recitation. Professor Calderwood, Assistant Professor Mack and Mr. Bradley.

This course involves the approximate analysis of coal; determination of the calorific values of solid, liquid, and gaseous fuels; evaporative tests of steam boilers; testing of internal-combustion engines, including a study of the various auxiliaries for gas and oil engines; tests of compressed-air and refrigerating machinery.

120. STEAM AND GAS ENGINEERING C RECITATION. Junior and senior years, second semester. Lectures and recitations, two hours. Two semester credits. Prerequisites: Engineering Physics (Physics 150) and Calculus II (Math. 116). Mr. Bradley.

A descriptive study is made of steam boilers, steam engines, steam turbines, gas and oil engines, including the various auxiliaries. Text: Allen and Bursley's *Heat Engines*.

125. STEAM AND GAS ENGINEERING C LABORATORY. Junior and senior years, second semester. Laboratory, three hours. One semester credit. Taken with Steam and Gas Engineering C Recitation. Assistant Professor Mack and Mr. Bradley.

The study and calibration of steam gauges, indicators, and planimeters; calorimeters; evaporative tests of steam boilers; determination of the heating value of liquid and gaseous fuels; tests of steam engines; valve setting; tests of steam turbines; tests of internal-combustion engines; operation and testing of refrigerating machines are involved in this course.

130. ELEMENTS OF STEAM AND GAS POWER. Freshman year, both semesters. Lectures, recitations, and laboratory, six hours. Two semester credits. Professor Calderwood, Assistant Professor Mack and Mr. Bradley.

An elementary study is made of steam engines, steam turbines, steam boilers, steam power-plant auxiliaries, gas and oil engines, natural and manufactured gas, gas power-plant auxiliaries, and the elements of automotive engineering. Text: Potter and Calderwood's *Elements of Steam and Gas Power Engineering*.

170. DAIRY REFRIGERATION RECITATION. Elective, first semester. Lectures and recitations, one hour. One semester credit. Mr. Bradley.

The elementary theory and principles of operation of various refrigerating and ice-making machinery and of cold storage, with special reference to the dairy industry, are considered.

175. DAIRY REFRIGERATION LABORATORY. Elective, first semester. Laboratory work, three hours. One semester credit. Mr. Bradley.

Various types of refrigeration systems and their operation are studied; steam-engine operation is studied, and refrigeration machines are tested.

195. THESIS. Senior year, continuing through both semesters. First semester: laboratory, three hours; one semester credit. Second semester: laboratory, six hours; two semester credits. Professor Calderwood.

The laboratories of the department are well furnished with apparatus suitable for experimental and research work in the field of heat-power engineering. The subject of the investigation should be selected in consultation with the head of the department at the beginning of the first semester.

FOR GRADUATES AND UNDERGRADUATES

206. POWER-PLANT ENGINEERING. Senior year, first semester. Laboratory, nine hours. Three semester credits. Prerequisite: Steam and Gas Engineering II. Professor Calderwood, and Assistant Professor Mack.

One-half of the semester is devoted to complete power-plant testing; special investigations of steam-engine performance; operation of gas producers, and advanced laboratory work on internal-combustion engines. The remainder of the time is spent in designing a complete power plant.

210. REFRIGERATION, HEATING, AND VENTILATION RECITATION. Senior year, second semester. Lectures and recitations, two hours. Two semester credits. Prerequisite: Steam and Gas Engineering II. Professor Calderwood.

This course is planned to acquaint the student with the fundamental principles of refrigerating systems, and the application of refrigeration to ice making, cold storage, and the cooling of air, liquids, and solids; also the fundamental principles of heating and ventilation, including the direct and indirect systems, hot-air, hot-water and steam systems of heating. Text: Allen and Walker's *Heating and Ventilation,* and notes on refrigeration.

215. REFRIGERATION, HEATING, AND VENTILATION LABORATORY. Senior year, second semester. Laboratory, three hours. One semester credit. Taken with Refrigeration, Heating and Ventilation Recitation. Professor Calderwood and Assistant Professor Mack.

The laboratory work includes tests of refrigerating machinery and of the thermal conductivity of insulating materials; tests on fans and blowers, radiators and house-heating boilers. The remainder of the time is devoted to the design of heating and ventilating systems for buildings.

220. AERODYNAMICS RECITATION. Elective, senior year, second semester. Lectures and recitations, two hours. Two semester credits. Prerequisite: Steam and Gas Engineering II. Professor Calderwood.

This course is planned to acquaint the student with the fundamental principles of airplane construction and the theory of wind forces. A careful study of aëronautical instruments and current practice in the design of airplanes is included. Text: William's *The Dynamics of the Airplane,* and references to various publications and notes.

225. AERODYNAMICS LABORATORY. Elective, senior year, second semester. Laboratory, three hours. One semester credit. Taken with Aërodynamics Recitation. Professor Calderwood and Assistant Professor Mack.

The laboratory work includes tests of various types and forms of airplane wing models, efficiency tests of propellers, and investigation of theory advanced in Aërodynamics Recitation.

FOR GRADUATES

301. ADVANCED THERMODYNAMICS. Elective, first or second semester. Lectures and recitations, two hours. Two semester credits. Professor Calderwood.

A study is made of the advanced phases of engineering thermodynamics, including research work along fundamental properties of gases and vapors. Reports are made of recent investigations along thermodynamic lines.

305. ENGINEERING RESEARCH. Elective, first or second semester. One semester credit for each three hours of laboratory work. Professor Calderwood and Assistant Professor Mack.

The laboratory work is correlated with the work of the Engineering Experiment Station. Investigations on lubricants, fuels, combustion, internal-combustion engines, steam engines, steam turbines, steam boilers, gas producers, refrigeration, heat insulating materials, heating and ventilation, compressed air and similar subjects are carried on.

Data secured in this course may be used as the basis for a master's thesis.

310. STEAM TURBINES. Elective, first or second semester. Lectures and recitations, two hours. Two semester credits. Professor Calderwood.

A study is made of the theoretical principles involved in the various important types of steam turbines, and the construction and operation of some of the commercial types. The selection of a steam turbine as a prime mover for power plants operating under particular operating conditions, and the effect of factors such as superheat, vacuum and pressure are fully discussed.

Shop Practice

Professor CARLSON
Assistant Professor SELLERS
Assistant Professor JONES
Assistant Professor LYNCH
Assistant Professor DUNN
Instructor GRANT
Instructor BOWHAY
Instructor HANSEN
Instructor STROM
Instructor WINTER
Instructor AIMAN
Instructor GRANELL
Instructor FLAGG
Instructor SLATER
Assistant REYNOLDS

The work in the shops is planned to meet the needs of three classes of students: (1) those in the special courses related to engineering and agriculture who expect to make use of the knowledge gained in their subsequent work in the shops and on the farm; (2) those who are training themselves for teaching and need to secure a general knowledge of the principles underlying shop work, and sufficient skill in the performance of various operations, to be able to instruct others; and (3) those in the courses in engineering whose need is to secure a thorough knowledge of the methods of performing various kinds of shop work; of the machines best suited for the different purposes; of the amount of work that may be expected of the different machines and of the workman under different conditions.

The shop building is a series of connected structures. The wood shop is a room 40 by 90 feet and is devoted entirely to bench work. The pattern shop is 45 by 81 feet and contains modern apparatus for pattern making. The wood machinery room is 35 by 42 feet and contains an excellent assortment of machines used in exemplifying commercial woodworking methods. The machine shop, 40 by 170 feet, is one of the best equipped shops of its kind in the country. The blacksmith shop is 50 by 100 feet and is equipped with forty-five modern down-draft forges, oxyacetylene welding outfits and other important equipment. The iron and brass foundries, 27 by 100 and 24 by 34 feet, respectively, are modern in every respect.

An amphitheater is adjacent to the blacksmith shop and is available for lecture and demonstration work. A locker room of ample capacity is conveniently located in the shops building for the use of students taking work in the department.

COURSES IN SHOP PRACTICE

FOR UNDERGRADUATES

101. ENGINEERING WOODWORK I. Freshman year, both semesters and summer school. Laboratory, three hours. One semester credit. Prerequisite: None. Mr. Aiman.

This is a course for engineering students and is devoted to such work as the selection, installing, and operation of woodworking machines, under as nearly as possible actual factory conditions.

The lecture work which accompanies the course covers problems that are typical of modern woodworking plants, with special emphasis placed on methods of routing, scheduling and handling of material through the shop.

105. WOODWORK I. Elective, first semester. Laboratory, three hours. One semester credit. Prerequisite: None. Mr. Aiman and Mr. Slater.

This beginning course is designed to give practice with the woodworking bench tools on the various common woods, and to teach the proper methods of finishing woods with stains, varnish, paint, etc. Considerable emphasis is placed upon the proper use and care of tools.

110. WOODWORK II. Elective, second semester. Laboratory, three hours. One semester credit. Prerequisite: Woodwork I (Shop 105). Mr. Aiman and Mr. Slater.

This is a continuation of Woodwork I, with practice in the use of the rabbet, router, and matching planes, and with the plow dado and fillister on such work as will give the necessary practice. Considerable emphasis is laid upon the proper use and care of the tools and on the use of wood finishes.

115. Woodwork III. Elective, first semester. Laboratory, three hours. One semester credit. Prerequisite: Woodwork II (Shop 110). Mr. Aiman and Mr. Slater.

In this course in mill work, practice is given on such articles as bring into use all of the woodworking machinery.

120. Woodworking for Grammar Grades. Elective, first semester and summer school. Laboratory, six hours. Two semester credits. Prerequisite: None. Mr. Aiman and Mr. Slater.

This course is designed for those who are preparing to teach manual training. It takes up the beginning work, and the exercises given are such as would be suitable for the grammar grades.

125. Woodworking I for High Schools. Elective, second semester and summer school. Laboratory, six hours. Two semester credits. Prerequisite: Woodworking for Grammar Grades (Shop 120). Mr. Aiman and Mr. Slater.

In this continuation of Woodworking for Grammar Grades, problems suitable for students in the high schools are given. Special attention is given to the study of woods and methods of finishing them, as well as to the use and care of tools.

130. Woodworking II for High Schools. Elective, first semester and summer school. Laboratory, six hours. Two semester credits. Prerequisite: Woodworking I for High Schools (Shop 125). Mr. Aiman and Mr. Slater.

This is a continuation of Woodworking I for High Schools, with advanced work in cabinet construction by the use of woodworking machinery, and such bench work as necessary. Special emphasis is placed upon the quantity as well as the quality of the work, in order that a proper use may be made of time. Assignments are given which cover woodworking machinery, tools, and sharpening, and the drawing up of sketches for a completely equipped woodworking shop.

135. Woodturning. Elective, second semester and summer school. Laboratory, six hours. Two semester credits. Prerequisite: Woodworking II for High Schools (Shop 130). Mr. Aiman and Mr. Slater.

This work is such as will give the student a thorough training in handling a lathe and turning tools. Those taking this work are expected to arrange their assignments so that a portion of the time can be devoted to assisting with the teaching of the more elementary classes in the wood shop. This training will be found valuable to those who have had no teaching experience.

140. Advanced Woodwork. Elective, first semester. Laboratory, six hours, supplemented by lectures. Two semester credits. Prerequisite: Engineering Woodwork I (Shop 101). Mr. Aiman.

Bench and machine work in making some of the most common building details, such as porch newels and rails, and plain and fancy molding cornices, is given. The lecture work consists of a detailed study of the wood finishes, tools, and machines used in building construction.

141. Farm Shop Practice. Elective, summer school. Laboratory, nine hours. Three semester credits. Assistant Professors Sellers and Lynch.

This course is designed for those who wish to prepare themselves for teaching in accordance with the Smith-Hughes act. The course consists of blacksmithing closely related to farm work, babbitting, soldering, gluing belts, belt lacing, thread cutting with hand dies and taps, drilling, drill grinding, and brazing. Valve grinding, timing, ring fitting, adjusting bearings on gas engines and automobiles are also included.

145. Pattern Making. Junior and senior years, both semesters. Laboratory, three hours. One semester credit. Prerequisite: Foundry Practice (Shop 160). Mr. Flagg.

A series of exercises is given embodying the principles governing the construction of plain and split patterns, including core prints and core boxes, after which practical patterns are made of machine parts.

146. FARM WOODWORK. Elective, summer school. Laboratory, nine hours. Three semester credits. Mr. Aiman and Mr. Slater.

This practical course is designed for the training of teachers to handle problems in connection with carpenter work on the farm. It consists of rafter cutting and erection, studding and siding work, making window and door frames, hanging doors, and similar building operations on full-size construction work. Bills of materials will be made in all cases before each exercise is started. Exercises are given in saw filing, tool sharpening, and the general care and upkeep of tools.

150. FORGING I. Freshman year, both semesters and summer school. Laboratory, three hours. One semester credit. Prerequisite: None. Assistant Professor Lynch, Mr. Granell and Mr. Reynolds.

This course in the forging of iron and steel is designed to teach the principles and operations of drawing, bending, upsetting, welding, twisting, splitting, and punching, and the proper methods of making forgings and tools. Tools required: a two-foot rule and a pair of five-inch outside calipers, a center punch, and ball pein hammer weighing with handle about two pounds.

155. FORGING II. Sophomore year, both semesters and summer school. Laboratory, three hours. One semester credit. Prerequisite: Forging I (Shop 150). Assistant Professor Lynch, Mr. Grannell and Mr. Reynolds.

Advanced work in the forging of iron and in the manufacture of steel tools is given, including instruction in hardening, tempering, casehardening, and annealing, heat treating, and testing of tool steels. Tools required: Same as in Forging I.

160. FOUNDRY PRACTICE. Sophomore year, both semesters. Laboratory, three hours. One semester credit. Prerequisite: None. Mr. Grant.

Practice is given in floor, bench, and machine molding, in core making, and in casting in iron, copper, brass, and special alloys. A study is also made of modern foundry construction, equipment, materials, and methods.

165. METALLURGY. Sophomore year, both semesters and summer school. Lectures and recitations, two hours. Two semester credits. Prerequisites: Chemistry E-I (Chem. 107); and Chemistry E-II, or may be taken with Chemistry E-II. Assistant Professor Sellers.

This course deals with the manufacture and use of iron, steel, copper, and their alloys, as well as their proper selection and use in the manufacturing industries.

170. MACHINE TOOL WORK I. Junior year, both semesters and summer school. Laboratory, six hours. Two semester credits. Prerequisite: Foundry Practice (Shop 160). Assistant Professor Jones, Mr. Bowhay and Mr. Hansen.

Practice is given in chipping, filing, shaper and planer work, scraping, drilling and turning on the lathe. Tools required: A four-inch scale, one nine-inch combination square, one pair five-inch outside calipers, one pair five-inch inside calipers, one center drill, and one B. & S. center gauge.

180. ADVANCED PATTERN MAKING. Elective, both semesters. Laboratory, three hours. One semester credit. Prerequisite: Pattern Making (Shop 145). Professor Carlson and Mr. Flagg.

This is a continuation of Pattern Making, with more advanced work, including match-board work, patterns for molding machines, and general pattern work.

183. ADVANCED FOUNDRY PRACTICE. Elective, both semesters. Laboratory, three hours. One semester credit. Prerequisite: Foundry Practice (Shop 160). Professor Carlson and Mr. Grant.

This is a continuation of Foundry Practice, including green and dry sand and loam molding. A study is also made of the different mixtures of iron, of handling the cupola and brass furnace, of difficult molding and core work, and of making steel castings.

186. FORGING III. Elective, both semesters. Laboratory, three hours. One semester credit. Prerequisite: Forging II (Shop 155). Assistant Professor Lynch, Mr. Granell and Mr. Reynolds.

More advanced work is given in the working of iron and steel and in studying the effect of the different heat treatments upon steel. Opportunity will be given for work with the oxyacetylene and thermit processes of welding.

189. FORGING IV. Elective, both semesters. Laboratory, three hours. One semester credit. Prerequisite: Forging III (Shop 186). Professor Carlson and Assistant Professor Lynch.

Opportunity is offered for work in steel and iron, oxyacetylene welding, steam hammer work, drop forge work, and other lines, depending upon the object in view and the previous training of the student.

192. MACHINE TOOL WORK II. Junior year, both semesters and summer school. Laboratory, six hours. Two semester credits. Prerequisite: Machine Tool Work I (Shop 170). Assistant Professor Jones, Mr. Bowhay and Mr. Hansen.

Progressive problems are given in turning and calipering, in boring, in reaming and taper turning and in threading on the lathe with exercises in chucking, the use of forming tools, and gear cutting. A study is made of cutting edges and tool adjustments best suited to the different metals, and of cutting speeds and feeds. Tools required: same as for Machine Tool Work I.

193. MACHINE TOOL WORK III. Senior year, both semesters and summer school. Laboratory, three hours. One semester credit. Prerequisite: Machine Tool Work II (Shop 192). Assistant Professor Sellers, Assistant Professor Jones, Mr. Bowhay and Mr. Hansen.

This course takes up work on the turret lathe, boring mill, screw machines, automatic screw machines, and grinder. Practical work is also given with the jigs and templets and a study is made of the rapid production of duplicate parts, of belts, lacings, and other methods of belt connection, and of compound and differential indexing.

195. THESIS. Senior year, continuing through both semesters. First semester: laboratory, three hours; one semester credit. Second semester: laboratory, six hours; two semester credits. Professor Carlson and Assistant Professor Sellers.

A thesis gives an opportunity for the student to work out problems of interest and value to himself under his own initiative, but subject to the supervision of the instructors. The shops have ample facilities for carrying on work of this character, of a constructive or investigative nature, and every possible aid is given those who select theses along this line.

196, 197. AUTOMOTIVE ENGINEERING. Elective, second semester. Lectures and recitations, one hour; laboratory, three hours. Two semester credits. Prerequisites: Strength of Materials, Machine Design II.

This course deals with the construction and operation of the various parts of the automobile, and is especially adapted to the needs of those who expect to follow some phase of automobile work or to take up employment in automobile factories.

FOR GRADUATES AND UNDERGRADUATES

235. MACHINE TOOL WORK IV. Elective, both semesters. Laboratory, three hours. One semester credit. Prerequisite: Machine Tool Work III (Shop 230). Assistant Professors Sellers and Jones.

The time of this course is devoted to the shop phases of efficiency engineering, including time studies and routing of materials. Complete machines and machine parts are constructed from drawings and blue prints. A study is made of the different machine tools from assigned catalogue work, with regard to the economical and efficient production of different classes of products.

240. MACHINE TOOL WORK V. Elective, both semesters. Laboratory, three hours. One semester credit. Prerequisite: Machine Tool Work IV (Shop 235). Assistant Professors Sellers and Jones.

This course is devoted entirely to a systematic study to determine the various time elements that are required in the efficient production of standard machine parts which are being made in the shops.

245, 250. FACTORY ENGINEERING. Senior year, first semester. Lectures and recitations, one hour; drafting-room, three hours. Two semester credits. Prerequisite: Strength of Materials (Ap. Mech. 110). Professor Carlson.

This course deals with the problems of the factory executive, such as the selection, installation, and arrangement of direct and indirect equipment, the standardization of machines and tools, stock and store methods, production orders, routing and dispatching, time study and rate setting, instruction and operation cards, wage systems, cost systems, and the various factors that have to do with the design and control of factories.

255. FACTORY DESIGN. Senior year, second semester. Drafting, six hours. Two semester credits. Prerequisite: Factory Engineering (Shop 245, 250). Professor Carlson.

The knowledge gained in the shops and laboratories and in the course in factory engineering is used in the design of a complete factory.

260. ADVANCED SHOP PRACTICE. Elective, first semester. Laboratory, nine hours. Three semester credits. Professor Carlson and assistants.

Opportunity is offered those having the necessary preliminary training to specialize to a limited degree along certain lines of Shop Practice, such as the heat treatment of steel, oxyacetylene welding, jig and die work, cutting speeds and feeds, shop management, and systems.

265. SHOP-PRACTICE RESEARCH. Elective, both semesters. Laboratory, nine hours. Three semester credits. Professor Carlson and Assistant Professor Sellers.

Those who wish to investigate some phase of shop-practice work in which they are greatly interested are given opportunity to do so. The wonderful improvements in the methods of present-day production amply justify investigative work along this line, and every possible aid will be accorded those wishing to take this work.

Engineering in the Summer School

In order to encourage the introduction of manual training and industrial drawing in the common schools and high schools of the state, and to improve the quality of work now being given, the College offers summer courses in mechanical drawing, manual training, and shop practice for high-school and grade teachers.

In addition various courses required in the several engineering curricula are offered in the Summer School. This enables teachers who wish to take an engineering curriculum to get a considerable start on the work during their summer vacations, and also enables College students who are irregular to make up their back courses.

For full information in regard to the courses offered, a special circular giving details concerning the Summer School may be had upon application to the vice president of the College.

Special Courses Related to Engineering

Special short courses dealing with automobile repair, tractor operation, carpentry, machine-shop work, foundry practice, blacksmithing, and electrical repair work are grouped with other special courses in another part of this catalogue, and are there described in detail. Reference should be made to the general index in the back of this book. A special circular describing this work may be had on application to the vice president of the College.

The Division of Home Economics

HELEN BISHOP THOMPSON, *Dean*

Modern research in the sciences and present-day development of the industries, arts, and professions have brought a recognition of the value of technical training as a part of the preparation for life's work. An educational plan which combines industrial, technical, and scientific subjects with the older general studies results to the student in the power to express, in everyday activities, the knowledge acquired in the classroom. It increases the capacity for productive work and develops the desire to realize in practical form the theories and principles studied. The aim of a collegiate course in home economics is not merely to increase the student's stock of information, but to stimulate interest in continued study or research, to train in accuracy in detail, to teach discrimination with regard to criteria by which to interpret results of work, and to cultivate an attitude of economic and social responsibility.

The course as outlined below is arranged to meet the needs of the following groups of students: those who wish to teach, those who wish to enter graduate courses leading to technical or professional work, and those who wish to apply their knowledge to various problems of home life or in fields of industry and social service in which an understanding of home-economics subjects is essential to intelligent action. While emphasis is laid on the material and practical side of life, the training does not stop here. The young women are constantly reminded that life is not drudgery; that technical knowledge and scientific skill even fail to include the full meaning of education in its highest sense. They are taught that any training that fails to develop harmoniously body, mind, and spirit is inadequate and incomplete. They are brought face to face with ideals as well as with actualities, and are made to see that, while skillful labor gives dignity to life, grace, refinement, and self-poise are the highest requisites for true service.

The training given is as varied as it is broad. It includes a knowledge of the laws of health, an understanding of the sanitary requirements of the home; the study of values, both absolute and relative, of the various articles used in the home; the wise expenditure of money, time, and energy; the scientific principles underlying the selection and preparation of food; the right care of children; and the ability to secure efficient service from others. Instruction is methodical and thorough, and is suited to the circumstances of the students. Experience shows that such training teaches contentment, industry, order, and cleanliness, and fosters a woman's independence and feeling of responsibility.

The work in home economics includes:

A four-year curriculum, leading to the degree of Bachelor of Science.

A five-year curriculum leading to the degree of Bachelor of Science and a diploma in nursing.

A three-year curriculum in the School of Agriculture.

A one-year curriculum in lunch-room management, for which a certificate is granted.

A housekeepers' course, about fifteen weeks in length, for which a certificate of proficiency is granted.

CURRICULUM IN HOME ECONOMICS

The training in the four-year curriculum is both general and specific. Since scientific training is fundamental in the intelligent and successful administration of the home, strong courses in the sciences are given as a foundation for the special training in home economics. To the end that well-rounded culture

may be attained, courses in English, history, economics, sociology, and psychology receive due prominence. The time of the student is about equally divided among the purely technical subjects, the fundamental sciences, and studies of general interest. The courses in the related subjects are given in the different departments of the College, while the technical courses are given by the home economics departments. In the junior and senior years opportunity is given for choice of electives, which makes it possible for students to specialize in some chosen line. To this end electives are to be chosen in groups combined logically in courses approved by the Faculty or by the student's dean.

The four-year curriculum is recommended for all who desire to teach home economics, or to enter any professional field in which home economics may be applied.

The five-year curriculum, offered in affiliation with the Charlotte Swift Hospital of Manhattan, enables the student wishing to take the Bachelor of Science degree and the full professional training in nursing to complete this work in five years. The first two years are spent at the College. A modified home economics curriculum is followed, including the sciences upon which nursing is based and omitting the subjects marked with an asterisk. The third and fourth years are spent at the Nursing School of the hospital, where both theoretical and practical training in nursing is given. During the fifth year required courses for the Bachelor of Science degree are completed at the College and electives are chosen which will prepare the student for the field of nursing in which she is most interested.

The demand for trained women to fill administrative and teaching positions in schools of nursing and to enter the various branches of public-health nursing is greater than the supply and offers a growing and attractive field of work for the college graduate.

Before entering upon this curriculum the student must have her plan of study approved by the dean of the Division of Home Economics.

Further information concerning the work at the hospital may be obtained from the director of the Training School for Nurses of the Charlotte Swift Hospital, Manhattan.

The College does not assume the responsibility of insuring employment to graduates, but the latter rarely experience difficulty in obtaining remunerative positions.

Curriculum in Home Economics

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester	
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Chemistry I Chem. 101	5(3-6)	Chemistry II Chem. 102	5(3-6)
Design *or* Design A* Ap. Art. 101 *or* 106	3(1-6)	Household Physics Physics 101	4(3-3)
Foods I* Food and Nut. 101	3(1-6)*or*	Clothing I* Clo. and Text. 101	2(1-3)*or*
Elem. Hygiene and Home Nursing† Hshld. Econ. 103	3(3-0)	House Furnishings*‡ Ap. Art. 108	2(1-3)
Library Methods Lib. Ec. 101	1(1-0)	Costume Design I* Clo. and Text. 106	2(0-6)
Current History Hist. 126	1(1-0)	Physical Education W-II Phys. Ed. 152A	1(0-3)
Physical Education W-I Phys. Ed. 151A	1(0-3)		

SOPHOMORE

First Semester		Second Semester	
Organic Chemistry HE Chem. 121	5(3-6)	Foods II Food and Nut. 106	5(3-6)
English Literature HE-I Engl. 177	3(3-0)	English Literature HE-II Engl. 180	3(3-0)
General Zoölogy Zoöl. 105	5(3-6)	Embryology and Physiology Zoöl. 108	5(3-6)
Clothing II* Clo. and Text. 111	3(1-6)	Gardening* Hort. 122	3(3-0)
Physical Education W-III Phys. Ed. 153	1(0-3)	Physical Education W-IV Phys. Ed. 154	1(0-3)

JUNIOR

First Semester		Second Semester	
German I† Mod. Lang. 101	3(3-0)*or*	German II† Mod. Lang. 102	3(3-0)*or*
French I† Mod. Lang. 151	3(3-0)	French II† Mod. Lang. 152	3(3-0)
Human Nutrition Food and Nut. 112	3(3-0)	Household Management* Hshld. Econ. 106	2(2-0)
Household Microbiology* Bact. 121	5(3-6)	Textiles* Clo. and Text. 116	3(2-3)
Economics Econ. 101	3(3-0)	Psychology C Educ. 103	3(3-0)
Elective	3(-)	Elective	6(-)

SENIOR

First Semester		Second Semester	
German Readings Mod. Lang. 111	3(3-0)*or*	American Government Hist. 151	3(3-0)
French Readings Mod. Lang. 161	3(3-0)	Sanitation and Public Health Hshld. Econ. 211	3(3-0)
American History I Hist. 101	3(3-0)	Elective	11(-)
Dietetics Food and Nut. 201	5(3-6)		
Elective	6(-)		

Groups of Electives for Students in the Division of Home Economics

The groups given below are selected with a view to training students for the vocations in which home economics may be directly applied.

A sufficient number of hours may be chosen from any group to fill the elective requirement, or a smaller number of hours may be taken from a group and, for the remaining elective hours, advanced courses of related subject matter may be chosen.

Music may be added to any group.

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* These subjects are omitted in the modified curriculum, which gives the Bachelor of Science degree and full professional training in nursing in five years. See the preceding page.

† Students who have offered French or German for entrance should take advanced courses in modern language, the courses which they take depending upon their preparation. Students who under these circumstances take less than nine semester credits in modern language are required to take additional elective hours, so that their total requirement is the same as for other students.

‡ The substitution of these courses for the courses in Foods I and Clothing I must first have the approval of the dean of the division.

Advertising, Buying and Salesmanship

First Semester		Second Semester	
Design A App. Art 106	3(1-6)	Principles of Advertising Ind. Jour. 179	3(3-0)
Clothing Salesmanship Clo. and Text. 130	2(2-0)	Written and Oral Salesmanship Engl. 123	3(3-0)
Commercial Correspondence Engl. 122	3(3-0)	Applied Psychology Educ. 215	2(2-0)
Oral English I Engl. 128	3(3-0)	Accounting Practice I Math. 140	3(3-0)
Industrial Feature Writing I Ind. Jour. 167	2(2-0)	Business Management Econ. 126	2(2-0)
Technical Writing Engl. 207	2(2-0)		

Certificate Requirements for Vocational Home Economics Teaching

Educational Administration A *or* B Educ. 105 *or* 106	3(3-0)	Educational Sociology A *or* B Educ. 118 or 119	3(3-0)
Special Methods in the Teaching of Home Economics Educ. 132	3(3-0)	Home Economics Education Educ. 122	3(3-0)
Child Welfare Hshld. Econ. 203	3(3-0)	Supervised Observation and Teaching in Home Economics Educ. 160	3(-)
		Practice Course in Household Management Hshld. Econ. 116	3(-)
		Electives	5(-)

Clothing and Textile Work

Household Entomology Ent. 106	2(2-0)	Principles of Art and their Application Ap. Art. 124	3(3-0)
Problems in Household Economics Hshld. Econ. 243	2(2-0)	Labor Problems Econ. 111	2(2-0)
Clothing Salesmanship Clo. and Text. 130	2(2-0)	Clothing Economics Clo. and Text. 237	2(2-0)
Problems in Hygiene of Clothing Clo. and Text. 240	2 to 4	Social Problems Econ. 257	2(2-0)
American Industrial History Hist. 105	3(3-0)		

Designing and Decorating

Free-hand Drawing I Arch. 111	2(0-6)	Free-hand Drawing II Arch. 114	2(0-6)
Woodwork I Shop 105	1(0-3)	Woodwork II Shop 110	1(0-3)
Photography Physics 120	2(1-3)	Principles of Art and their Application Ap. Art 124	3(3-0)
Landscape Gardening I Hort. 126	2(1-3)	Landscape Gardening II Hort. 238	3(0-9)
Principles of Topography I Ind. Jour. 101	3(2-3)	Principles of Topography II Ind. Jour. 104	3(2-3)
		Handicraft Ap. Art 112	2(0-6)
		Interior Decoration and Furnishing Ap. Art 114	3(1-6)
		The Arts and Crafts Movement Engl. 295	2(2-0)

Food and Nutrition

(Research Hospital Dietetics; Public Health Work; Specialized Teaching)

Physical Chemistry
Chem. 206 ..... 5(3-6)
Microchemical Methods of Analysis
Chem. 245 ..... 1(0-3)
Anatomy and Physiology
Anat. 131 ..... 3(2-3)
Hygienic Bacteriology
Bact. 206 ..... 4(2-6)
Problems in Food Economics and Nutrition I
Food and Nut. 248 ..... 2 to 5
Food Economics and Nutrition Seminar I
Food and Nut. 251 ..... 2(2-0)
Field Work in Nutrition
Food and Nut. 215..... 1 to 3
Physiological Chemistry
Chem. 231 ..... 5(3-6)
Biochemical Preparation
Chem. 234 ..... 5(0-15)
Quantitative Analysis
Chem. 241 ..... 5(1-12)
Food Analysis
Chem. 257 ..... 3(0-9)
Household Chemistry
Chem. 265 ..... 3(1-6)
Histology I
Path. 101 ..... 3(1-6)
Food Economics and Nutrition Seminar II
Food and Nut. 252..... 2(2-0)
Dietetics for Abnormal Conditions
Food and Nut. 204..... 2(2-0)

Homemaking

Child Welfare
Hshld. Econ. 203 ..... 3(3-0)
Home Nursing
Hshld. Econ. 109 ..... 1(0-3)
The Modern Family
Hshld. Econ. 231 ..... 2(2-0)
Household Entomology
Ent. 106 ..... 2(2-0)
Sociology
Econ. 151 ..... 3(3-0)
Interior Decoration and Furnishing
Ap. Art 114 ..... 3(1-6)
Principles of Art and their Application
Ap. Art 124 ..... 3(3-0)
History of the Home
Hist. 225 ..... 3(3-0)
Household Chemistry
Chem. 265 ..... 3(1-6)
Rural Sociology
Econ. 156 ..... 3(3-0)
Rural Leadership
Econ. 261 ..... 1(1-0)
Clothing III
Clo. and Text. 125..... 2(0-6)

Homemaking

(Special Rural Problems)

Poultry Bacteriology
Bact. 216 ..... 3(1-6)
Rural Sociology
Econ. 156 ..... 3(3-0)
Home Nursing
Hshld. Econ. 109..... 1(0-3)
Rural Organization
Econ. 264 ..... 2(2-0)
Rural Leadership
Econ. 261 ..... 1(1-0)
Plant Propagation
Hort. 101 ..... 3(2-3)
Orcharding
Hort. 107 ..... 2(1-3)
Small Fruits
Hort. 110 ..... 2(2-0)
Market Gardening
Hort. 210 ..... 3(2-3)
Home Dairying
Dairy Husb. 112..... 1½(2-3)
Home Poultrying
Poult. Husb. 102..... 1½(3-0)
Dairy Bacteriology
Bact. 211 ..... 3(1-6)
Apiculture
Ent. 111 ..... 3(2-3)
Farm Sanitation and Water Supply
Ag. Engr. 119 ..... 2(2-0)

Institutional Management

Institutional Management I
Hshld. Econ. 221..... 3(1-6)
Commercial Correspondence
Engl. 122 ..... 3(3-0)
Oral English I
Engl. 128 ..... 3(3-0)
Business Management
Econ. 126 ..... 2(2-0)
Technical Writing
Engl. 207 ..... 2(2-0)
Institutional Management II
Hshld. Econ. 226..... 4(3-3)
Problems in Institutional Administration
Hshld. Econ. 247..... 1 to 5
Institutional Furnishings
Ap. Art 116 ..... 3(1-6)
Institutional Accounting
Math. 131 ..... 3(3-0)
Written and Oral Salesmanship
Engl. 123 ..... 3(3-0)
Applied Psychology
Educ. 215 ..... 2(2-0)
Labor Problems
Econ. 111 ..... 2(2-0)

Lecturing and Demonstrating

Oral English I
Engl. 128 ..... 3(3-0)
Public Speaking I
Pub. Spk. 101..... 2(2-0)
Extempore Speech I
Pub. Spk. 106..... 2(2-0)
Sociology
Econ. 151 ..... 3(3-0)
Technical Writing
Engl. 207 ..... 2(2-0)
Practice in Food Demonstrations
Food and Nut. 117..... 1(0-3)
Oral English II
Engl. 131 ..... 3(3-0)
Public Speaking II
Pub. Spk. 102..... 2(2-0)
Extempore Speech II
Pub. Spk. 108..... 2(2-0)
Applied Psychology
Educ. 215 ..... 2(2-0)
Rural Sociology
Econ. 156 ..... 3(3-0)
Rural Leadership
Econ. 261 ..... 1(1-0)

Nursing

(For a diploma in nursing and the Bachelor of Science degree, the five-year curriculum must be chosen, replacing twenty-six required credits and fifteen elective credits of the four-year curriculum with nursing training. See page 133).

Materia Medica
Surg. and Med. 157..... 4(4-0)
First year at Hospital to replace first semester
Junior year .....17(-)
Electives ..... 4(-)
General Microbiology
Bact. 101 ..... 3(1-6)
Second year at Hospital to replace second semester
Junior year .....17(-)
Electives ..... 7(-)

Sanitary Science; Food and Market Inspection

Hygienic Bacteriology
Bact. 206 ..... 4(2-6)
Quantitative Analysis I
Chem. 150 ..... 2(0-6)
Dairy Chemistry
Chem. 254 ..... 3(1-6)
Chemistry of Meats
Chem. 255 ..... 3(1-6)
Food Analysis
Chem. 257 ..... 3(0-9)
Pathogenic Bacteriology I
Bact. 111 ..... 4(2-6)
Meat Inspection
Path. 216 ..... 2(2-0)

Social Welfare Work

Child Welfare
Hshld. Econ. 203..... 3(3-0)
Home Nursing
Hshld. Econ. 109..... 1(0-3)
The Modern Family
Hshld. Econ. 231..... 2(2-0)
Problems in Household Economics
Hshld. Econ. 243..... 1 to 5
Sociology
Econ. 151 ..... 3(3-0)
Pan-America
Hist. 207 ..... 2(2-0)
Rural Organization
Econ. 264 ..... 2(2-0)
Rural Leadership
Econ. 261 ..... 1(1-0)
Field Work in Nutrition
Food and Nut. 215..... 1 to 3
Labor Problems
Econ. 111 ..... 2(2-0)
Current Economic Problems
Econ. 225 ..... 2(2-0)
Rural Sociology
Econ. 156 ..... 3(3-0)
Social Problems
Econ. 257 ..... 2(2-0)
Rural Leadership
Econ. 261 ..... 1(1-0)
Modern Europe
Hist. 223 ..... 3(3-0)
Immigration and International Relations
Hist. 228 ..... 2(2-0)
Problems in Child Welfare
Hshld. Econ. 253 ..... 1 to 5
Social Case Work with Families
Hshld. Econ. 235..... 2 to 4

State Certificate Requirements for General Teaching

Educational Administration A *or* B
Educ. 105 *or* 106..... 3(3-0)
Educational Psychology
Educ. 109 ..... 3(3-0)*or*
Educational Sociology A *or* B
Educ. 118 *or* 119..... 3(3-0)
Additional Educational Courses..... 9(9-0)

(NOTE.—Home Economics Education (3 hrs.) and Special Methods in the Teaching of Home Economics (3 hrs.) should be included by students who wish to teach home economics. Modern Europe or Advanced English should be added by those expecting to teach these subjects. Additional courses may be chosen in the line of the student's interests.)

Applied Art

Professor HOLMAN
Instructor EVERHARDY
Assistant EVANS*
Assistant ARNOLD

Taste is cultivated through the impressions received in everyday surroundings and not through the occasional visits to art galleries. We are not so sensitive to discords in color and line as we are to discords in sound, because we have not trained our eyes as we have our ears. "The study of design furnishes a means of exercising and thus developing good taste in connection with the things which make up environment of everyday life and of awakening appreciation in nature and in art." Home decoration is a study of the factors which produce beautiful surroundings that make for enjoyment and peace. Each course consists of lectures, studio laboratory work, field observation work, and reading.

COURSES IN APPLIED ART

FOR UNDERGRADUATES

101. DESIGN. Freshman year, first semester. Class work, one hour; studio, six hours. Three semester credits. Professor Holman and Misses Everhardy and Arnold.

A study is made of the principles which control the use of color and the selection and arrangement of elements in the production of objects themselves and in their uses as parts of a whole. Many exercises are given in which clothing and home furnishings are scored as to design. A natural motif is adapted to material, function and form.

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* Resigned December 21, 1921.

106. DESIGN A. Freshman year, first semester. Class work, one hour; studio, six hours. Three semester credits. To be taken as a substitute for Design by students who have had color and design work acceptable to the department. Professor Holman and Miss Everhardy.

A further study is made of harmonies, adaptation of natural motifs, and design as applied to fabrics and other materials. Art masterpieces and articles of common use are studied according to the principles of design and color.

108. HOUSE FURNISHINGS. Freshman year, second semester. Class work, one hour; studio, three hours. Two semester credits. Prerequisite: Design or Design A. Professor Holman.

Design is the selection and arrangement of materials for the making of useful and beautiful things. The decorative phase of design is studied in the solving of problems which occur in the furnishings of the house.

112. HANDICRAFT. Elective, second semester. Studio, six hours. Two semester credits. Prerequisite: Design A. Miss Everhardy.

Both constructive and decorative designs are studied in handicraft work. Original designs are carried out in the following mediums: leather, clay, metal, reeds, and other materials.

114. INTERIOR DECORATION AND FURNISHING. Elective, second semester. Class work, one hour; studio, six hours. Three semester credits. Prerequisite: Design or Design A. Professor Holman.

This is a study of color, form and arrangement of home furnishings. Wall coverings, carpets, pictures, furniture, etc., are discussed and studied so that the student may recognize and appreciate what is appropriate and beautiful. A study is made of fine arts, of handicrafts, and of the history of furnishings. Problems in spacing and coloring of side walls are discussed and are developed in water color and decorating materials.

116. INSTITUTIONAL FURNISHINGS. Elective, second semester. Class work, one hour; studio, six hours. Three semester credits. Prerequisite: Design or Design A. Miss Everhardy.

A study is made of the fundamental principles of design, including color, form, and arrangement. These principles are applied to problems involving the selection and use of the following: wall, floors, furniture, finishes, coverings, linen, china, and silver.

120. SKETCHING. Elective, second semester. Studio, six hours. Two semester credits. Prerequisite: Design or Design A. Professor Holman.

Objects are sketched singly and in groups in the studio and out of doors. The media employed are pencil, charcoal, and brush. The aim is to train the student to see forms in perspective and to represent them with sufficient accuracy to apply in illustrating the more practical problems in the other courses in the department.

124. PRINCIPLES OF ART AND THEIR APPLICATION. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Design or Design A. Professor Holman.

A general survey is made of art periods as an index to what the art quality is. An examination is made of the religious, political, and social aspects of art expression. Architecture, furniture, textiles, sculpture, pictures, and the lesser art objects are compared as to their art quality. The modern fields of landscape, architecture, furnishings, clothing, advertising, etc., are surveyed. The principles controlling art expression are applied to these modern fields of life.

Clothing and Textiles

Professor GLANTON
Associate Professor COWLES
Instructor FECHT
Instructor WORCESTER
Instructor SCHELL
Assistant POLSON

Clothing is an important factor in both the physiological and psychological well-being of the individual and of the family. The wise selection of the clothing requires a high degree of skill in the application of hygienic, economic, and æsthetic principles. The preservation and care of clothing are based upon a practical knowledge of chemistry, entomology, and bacteriology. In the construction of garments, art, applied art, and technic are presented in their proper relations in order to train students in fundamental principles and enable them to utilize these principles in their everyday practices. In this department advanced courses are offered for students who wish electives which lead to vocational, professional, and business positions.

COURSES IN CLOTHING AND TEXTILES

FOR UNDERGRADUATES

101. CLOTHING I. Freshman year, second semester. Class work, one hour; laboratory, three hours. Two semester credits. Associate Professor Cowles, Miss Fecht, Miss Worcester, and Miss Polson.

The aim of this course is to train for efficiency in handling sewing equipment and materials. Attention and adaptation of commercial patterns, kinds, qualities, and quantities of materials are discussed. Emphasis is laid on principles of hygiene and sanitation as applied to clothing.

Laboratory.—The planning and construction of garments, including infants' wear, and simple problems in millinery are taken up in the laboratory. Rapid construction and labor-saving methods are emphasized.

106. COSTUME DESIGN I. Freshman year, second semester. Laboratory, six hours. Two semester credits. Prerequisite: Design (Ap. Art 101) or Design A (Ap. Art. 106). Miss Schell and Miss Polson.

This course treats of art in dress and comprises the application of the principles of color, harmony, and design; individual requirements in color and line; original problems in designs for decoration of costumes and for costumes in pencil, pen and ink, and water colors. This course is directly related to the construction of garments. The aim is to develop good taste in dress.

108. COSTUME DESIGN II. Elective, first semester. Laboratory, six hours. Two semester credits. Prerequisite: Costume Design I. Miss Schell.

Historic costume in its relationship to the present-day mode and to costumes for amateur performances or pageants, is studied in this course. Opportunity is offered for draping materials from original designs. Considerable attention is given to color and to the finishing touches of artistry necessary to complete a charming and appropriate costume.

111. CLOTHING II. Sophomore year, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Clothing I or its equivalent. Associate Professor Cowles, Miss Fecht, and Miss Worcester.

This course considers the manufacture and selection of clothing; clothing industries and clothing standards in their relation to the economic and social life of the community; comparison of home- and factory-made garments; standardization of dress, its advantages and disadvantages; clothing budgets for individuals and family groups. Economics of clothing is emphasized.

Laboratory.—The laboratory exercises consist of group work in making entire outfits of clothing for individuals of different ages or the planning and making of garments required in the wardrobe of a family.

116. TEXTILES. Junior year, first and second semesters. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Organic Chemistry. Miss Fecht.

This course considers the social and economic development of the textile industry, from the "industrial revolution" to the present time. The combination of art, science, and mechanics that makes possible the elaborateness of modern textiles is given due attention. The principal aim of the course is the development of a clear and sound judgment in the selection of textile fabrics for household and personal use.

Laboratory.—Chemical, physical, microscopic tests on textile fibers, yarns, and fabrics form a large part of the laboratory work. These include the simple tests that may be performed in any home, as well as technical, scientific tests requiring elaborate equipment. Laundry processes are studied and compared.

117. HISTORY OF TEXTILES. Elective, first semester. Class work, two hours. Two semester credits. Miss Fecht.

This course is planned for students interested in the early development of the textile industry from primitive ages up to the "industrial revolution" and the inauguration of the factory system. The growth and production of the four principal fibers of commerce are studied, together with unusual characteristics of the other fibers not so important.

125. CLOTHING III. Elective, second semester. Laboratory, six hours. Two semester credits. Prerequisites: Clothing I, or its equivalent, and Costume Design. Open to seniors and others upon consultation with the instructor. Miss Polson.

The course deals with the æsthetic and modish adaptation of materials to the individual, and aims to teach self-expression through dress. Several original designs in dressmaking and millinery are carried out in materials approved by the instructor. Students are allowed much freedom in the selection and execution of the problems.

127. PRACTICE IN CLOTHING DEMONSTRATIONS. Elective, first semester. Laboratory, three hours. One semester credit. Prerequisite or parallel: Clothing III. Professor Glanton and others.

This course is designed to meet the needs of those who plan to go into extension service or similar work as clothing specialists. Instruction is given in the technic of clothing demonstrations, and in the preparation and exhibition of necessary materials and equipment. Each student is required to give one or more practice demonstrations.

130. CLOTHING SALESMANSHIP. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Costume Design I. Open to students upon consultation with the instructor. Professor Glanton.

This course provides an introduction to the problems which present themselves to those preparing for positions as executives in department stores, service managers in factories, or teachers of salesmanship in high schools. Study of department-store policies and systems, the psychology of selling, the responsibility of the sales person to the customer. Conferences and reports are required. Actual practice in department stores is very desirable for all students.

FOR GRADUATES AND UNDERGRADUATES

237. CLOTHING ECONOMICS. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Economics. Professor Glanton.

This course includes a study of the organization of the clothing trades and industries; of wholesale and retail clothing markets; of wages and standards of efficiency in workmanship; conditions of work in the textile and clothing industries; standardization of fabrics; study of the budget for clothing and household textiles. Topics are assigned for reading and investigation and written reports are required.

240. PROBLEMS IN HYGIENE OF CLOTHING. Elective, first semester. From two to four semester credits. Prerequisites: Textiles, Embryology and Physiology, and Microbiology. Professor Glanton.

Students are assigned special problems for investigation of clothing in relation to health and its effect upon anatomical form, muscular development and physiological functions.

FOR GRADUATES

301. RESEARCH IN CLOTHING AND TEXTILES. Elective, both semesters. Credit as arranged. Prerequisites: consult instructors. Professor Glanton and Associate Professor Cowles.

A research problem in the hygienic or economic aspects of clothing or an investigation of textiles may be chosen as the basis of a thesis for the master's degree.

Food Economics and Nutrition

Professor BOGERT
Associate Professor PITTMAN
Assistant Professor RUBY
Instructor TACKABERRY
Instructor PEINE
Instructor HUDSON
Assistant TRAIL
Fellow KIRKPATRICK

Food is one of the determining factors in the health of the individual and of the family. The selection of wholesome and economical food requires the constant application of chemistry and of sanitary science. The preparation and preservation of food involve processes dependent upon physics, chemistry, and bacteriology. In the modern science of nutrition and dietetics, the student learns the chemical and physiological principles involved in the nutritive processes of the body and the quantitative application of these principles in planning food for the individual and the group. Science, applied science, and practice are presented in their proper relations in order to train the student in fundamental principles and to enable her to gain by experience methods of translating these principles into her everyday household practices. Advanced courses in this department provide for vocational and professional positions.

COURSES IN FOOD ECONOMICS AND NUTRITION

FOR UNDERGRADUATES

101. FOODS I. Freshman year, both semesters. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: entrance Physics; parallel, Chemistry I. Miss Tackaberry, Miss Hudson, Miss Trail, and Miss Kirkpatrick.

The class work includes a brief survey of the history and development of cookery and cooking utensils, consideration of the principles involved in the different methods of cooking and in the preservation of foods.

Laboratory.—Experimental work and practical cookery, illustrating the various methods of preparing foods, form the basis of the laboratory work, which also includes the study of stoves, fuels, food preservation, and simple meal planning.

104. ELEMENTARY FOODS AND NUTRITION. Elective, second semester. Class work, one hour. One semester credit. Professor Bogert.

This course consists of lectures and demonstrations offered for students in divisions other than the Division of Home Economics, who desire to obtain a popular knowledge of the composition of food and the principles involved in selecting food for the individual or the family group. It will not be given for a class of fewer than fifteen students.

106. FOODS II. Sophomore year, second semester. Class work, three hours; laboratory, six hours. Five semester credits. Prerequisites: Organic Chemis-

try, Foods I or its equivalent. Associate Professor Pittman, Miss Trail, Miss Hudson and Miss Tackaberry.

This course emphasizes the classification, composition, occurrence, and general properties of foodstuffs. Food values in relation to cost are considered, together with the legal and sanitary aspects of food products handled in commerce.

Laboratory.—Food products are handled in experiments which demonstrate the presence of the proximate principles and the various inorganic constituents, the changes they undergo in cooking, and their nutritive value as affected by admixture with other food materials. Recipes are compiled. Practice is given in judging food preparations.

112. HUMAN NUTRITION. Junior year, both semesters. Lectures and recitations, three hours. Three semester credits. Prerequisites: Organic Chemistry, Embryology and Physiology, and Foods II.* Dean Thompson and Professor Bogert.

This course comprises a study of the special characteristics and nutritive functions of the food constituents; the methods of investigation which have established the quantitative basis in dietetics; the digestive and metabolic processes and products with emphasis upon energy relations; the quantitative relations of the ash constituents; nitrogen and mineral balances; comparative economy in nutrition and growth of different types of food materials.

117. PRACTICE IN FOOD DEMONSTRATIONS. Elective, first semester. Laboratory, three hours. One semester credit. Prerequisite: Foods II. Associate Professor Pittman, with the assistance of other members of the departmental faculty.

This course is designed to meet the needs of those who plan to enter extension work, to become commercial demonstrators of food products, or to teach food study. Instruction is given in the technic of food demonstrations, and each student is allowed opportunity for practice work in various types of demonstrations.

FOR GRADUATES AND UNDERGRADUATES

201. DIETETICS. Senior year, both semesters. Class work, three hours; laboratory, six hours. Five semester credits. Prerequisites: Human Nutrition and Foods II. Assistant Professor Ruby, Mrs. Peine.

This course deals with the application of the principles of human nutrition to the practical feeding problems of the individual and the group. The following topics receive attention: daily food requirements for the normal individual throughout infancy, childhood, adolescence, adult life, and old age; typical dietaries for each period of life; milk formulæ; the problem of satisfying the diverse requirements in families and other groups.

Laboratory.—Studies in weight measures and cost of some of the common food materials; calculations and quantitative preparation of standard portions and combinations of foods; analyses of recipes; computation and scoring of dietaries with special regard to nutritive requirements for varying physiologic, economic, and social conditions; practice in marketing and serving, comprise the work in the laboratory. (Graduate students are required to do an assigned problem in place of the practice in marketing and serving included in the laboratory for undergraduates.)

204. DIETETICS FOR ABNORMAL CONDITIONS. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Dietetics. Assistant Professor Ruby.

Students who expect to qualify as professional dietitians, either in hospital work or elsewhere, should elect this course. A study is made of the varying dietetic requirements in different pathological conditions, such as diabetes, nephritis, gout, gastric ulcer, etc. Attention is given to the special foods used in such conditions, and dietaries are computed and scored.

* Students from other divisions desiring to elect Human Nutrition may substitute an equivalent number of hours in other sciences for Embryology and Physiology, and Foods II.

215. FIELD WORK IN NUTRITION. Elective, first semester. From one to three semester credits. Hours to be arranged. Prerequisites: Human Nutrition, and Dietetics. Assistant Professor Ruby.

This course comprises survey work along nutritional lines and corrective work with malnourished individuals, either separately or in groups.

243. PROBLEMS IN FOODS I. Elective, first semester. From one to three semester credits. Hours to be arranged. Prerequisites: Foods II and Human Nutrition. Associate Professor Pittman.

Special problems are assigned to students for individual consideration.

244. PROBLEMS IN FOODS II. Elective, second semester. From one to three semester credits. Hours to be arranged. Prerequisites: Foods II, and Human Nutrition. Associate Professor Pittman.

This course may be taken as a continuation of course 243 or may be elected independently.

248. PROBLEMS IN FOOD ECONOMICS AND NUTRITION I. Elective, first semester. From two to five semester credits, depending upon the nature of the problem. Conferences, laboratory work, and reports. Open to senior and graduate students. Dean Thompson and Professor Bogert.

The work of this course may consist of an assigned problem in the nutritive value of foods; a feeding experiment; dietary studies; or practice in the methods commonly used in the simpler experiments in nutrition.

249. PROBLEMS IN FOOD ECONOMICS AND NUTRITION II. Elective, second semester. From two to five semester credits, depending upon the nature of the problem. Conferences, laboratory work, and reports. Open to senior and graduate students. Dean Thompson and Professor Bogert.

This course may be taken as a continuation of course 248 or may be elected independently.

251. FOOD ECONOMICS AND NUTRITION SEMINAR I. Elective, first semester. Class work, two hours. One or two semester credits. Prerequisite: Human Nutrition. Professor Bogert.

This is a course of assigned reading and discussion of topics in the fields of food economics and nutrition. Special attention is given to recent literature, which bears upon problems in dietetics, in both normal and pathological conditions; upon growth and upon normal and subnormal nutrition in infancy and childhood. Feeding experiments are compared and discussed. A reading knowledge of modern languages, while not a fixed requirement, is urged as of especial advantage in this course.

252. FOOD ECONOMICS AND NUTRITION SEMINAR II. Elective, second semester. Class work, two hours. One or two semester credits. Prerequisite: Human Nutrition. Professor Bogert.

This course may be taken as a continuation of course 251 or may be elected independently.

FOR GRADUATES

305. RESEARCH IN FOOD ECONOMICS AND NUTRITION. Elective, both semesters. Credit as arranged. Prerequisites: Consult instructors. Dean Thompson and Professor Bogert.

Individual research problems are assigned, which may form the basis for the thesis submitted for a master's degree.

Household Economics

Professor KNEELAND
Assistant Professor LEAZENBY
Assistant Professor CARP
Instructor SPAFFORD †
Instructor ———*
Assistant KRAMER
Fellow KAUCHER

The successful administration of the home, whether it be for the family or for the larger institutional group, depends upon the wise expenditure of time, money, and effort, the maintenance of healthful and comfortable home conditions, and an appreciation of the importance of the family and the home and their relation to the rest of society. Through the courses in this department, therefore, training is given in household administration, in standards of living and the use of the family income, in institutional administration, in home nursing and sanitation, and in family and child welfare.

Students who wish to prepare themselves as social workers, directors of residence, cafeteria or lunch-room managers, hospital managers or dietitians, or teachers or demonstrators in home economics, will find suitable electives among the courses offered by this department.

COURSES IN HOUSEHOLD ECONOMICS

FOR UNDERGRADUATES

103. ELEMENTARY HYGIENE AND HOME NURSING.‡ Freshman year, first semester. Class work, three hours. Three semester credits. Miss Spafford.

Emphasis is placed upon personal hygiene as a means of maintaining and improving health in the home. Practical methods in the home care of the sick and the treatment of emergencies are studied and demonstrated.

106. HOUSEHOLD MANAGEMENT. Junior year, both semesters. Class work, two hours. Two semester credits. Prerequisites: Household Physics, Foods II, Clothing II. Professor Kneeland.

This course includes a study of the organization and simplification of housework through efficiency in house planning and construction, in the selection and arrangement of equipment, and in methods of housekeeping; standards of living and family expenditures, budgets, and accounts; problems of household service; experiments in coöperative laundering, cooking, etc.; the amount of time necessary for housework; and the use of leisure time.

109. HOME NURSING. Elective, both semesters. Laboratory, three hours. One semester credit. Prerequisite: Household Microbiology, Embryology and Physiology. Miss Spafford.

Training is given, through class discussions and demonstrations and through laboratory practice by the student, in the home care of the sick and the treatment of injuries, wounds, and other emergencies.

116. PRACTICE COURSE IN HOUSEHOLD MANAGEMENT. Elective, both semesters. Required of students who wish to qualify as home economics teachers under the Smith-Hughes requirement for vocational high schools. Three semester credits. Prerequisites: Household Physics, and Foods II. Prerequisite or parallel: Household Management. Consult instructor. Assistant Professor Leazenby.

This course is conducted in the practice house. The students live in a group and perform the usual household tasks, including marketing, planning, cooking and serving meals, caring for the rooms, planning the household budget, and keeping the accounts.

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* In charge of correspondence work in Household Economics, Home Study Service, Division of College Extension.

† Resigned January 1, 1922.

‡ This course may be taken in place of Foods I, with the approval of the dean of the division.

FOR GRADUATES AND UNDERGRADUATES

203. CHILD WELFARE. Elective, both semesters. Required of students who wish to qualify as home economics teachers under the Smith-Hughes requirement for vocational high schools. Class work, three hours. Three semester credits. Prerequisites: Embryology and Physiology, Household Microbiology, Psychology, Human Nutrition, Clothing II, and Textiles. Assistant Professor Leazenby.

A study is made of the needs of the child and of the methods of meeting these needs through the care of the child in the home and through community and child-welfare activities. The topics considered include the health problems of mother and child, child mentality and management, play and recreation, child labor, juvenile delinquency, and the special needs of defective and dependent children.

211. SANITATION AND PUBLIC HEALTH. Senior year, both semesters. Class work, three hours. Three semester credits. Prerequisites: Household Physics, Embryology and Physiology, Household Microbiology. Assistant Professor Leazenby and Miss Spafford.

This course deals with the household as a factor in health conservation, emphasis being placed upon the interrelation of home and community health. It includes a study of the influence upon health of the location, ventilation, heating, lighting, and water supply of the house; the sanitary disposal of sewage and other wastes; housing conditions and their control; vital statistics; the prevention and control of communicable and noncommunicable diseases; mental hygiene; public health activities and administration in relation to the home.

221. INSTITUTIONAL MANAGEMENT I. Elective, both semesters. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Foods II; prerequisite or parallel: Human Nutrition. Assistant Professor Carp and Miss Kramer.

This course deals with food problems of institutions, and includes the study of marketing, preparation of food, arrangement of menus, and cost of service for different types of institutions.

Laboratory.—The laboratory work is carried on in the College cafeteria, where food in large quantities is prepared for serving.

226. INSTITUTIONAL MANAGEMENT II. Elective, both semesters. Class work, three hours; laboratory, three hours. Four semester credits. Prerequisite: Institutional Management I. Assistant Professor Carp.

This course includes a study of the various types of institutions; the qualifications and duties of the manager; the planning, equipping, and general care of buildings and rooms; the organization of work; the management of employees; institutional accounting; office management.

Laboratory.—The laboratory work consists of practice in the various phases of institutional management in the College cafeteria. Opportunity is given for a visit to representative types of institutions in Kansas City.

231. THE MODERN FAMILY. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: senior or graduate standing. Consult instructor. Professor Kneeland.

A study is made of the functions of the modern family, based upon a brief survey of the historical background, and of the various problems which confront it, such as marriage rates and marriage laws, birth rates, the influence of the death or illness of parents, of low wages, unemployment and bad housing, the employment of mothers, family neglect, desertion, and divorce. Special emphasis is placed on the conditions met by the social case worker and on social programs for the maintenance and improvement of family welfare.

235. SOCIAL CASE WORK WITH FAMILIES. Elective, both semesters. Class work, one hour. Field work, three, six, or nine hours. Two to four semester credits. Prerequisites: Household Management, Clothing II. Prerequisite or

parallel: Sanitation and Public Health, Dietetics, Child Welfare, The Modern Family, and Sociology or Rural Sociology. Consult instructor. Professor Kneeland.

The class work consists of a study of the methods of social case work and their application to families in need of special care. The problems of investigation, weighing of evidence, sources of aid, plans of action, and follow-up work are considered. The rest of the time is spent in supervised field work with local social agencies.

243. PROBLEMS IN HOUSEHOLD ECONOMICS. Elective, both semesters. One to five semester credits. Prerequisite: Household Management. Consult instructor. Professor Kneeland.

Special problems are selected for individual investigation in standards of living and family expenditures, housing, household equipment, organization and methods of housework, use of time freed from housework, or social aspects of the household and of the family. Conferences are held and reports are made at hours arranged by appointment.

247. PROBLEMS IN INSTITUTIONAL ADMINISTRATION. Elective, both semesters. One to five semester credits. Prerequisite: Institutional Management I. Prerequisite or parallel: Institutional Management II. Consult instructor. Assistant Professor Carp.

Special problems in the administration of cafeteria, lunch and tea rooms, dining halls, dormitories, clubs, and other institutions, are selected for individual investigation. Conferences are held and reports are made at hours arranged by appointment.

253. PROBLEMS IN CHILD WELFARE. Elective, both semesters. One to five semester credits. Prerequisite: Child Welfare. Consult instructor. Assistant Professor Leazenby.

A special problem in some phase of child welfare is selected for individual investigation. Conferences are held and reports are made at hours arranged by appointment.

FOR GRADUATES

301. RESEARCH IN HOUSEHOLD ECONOMICS I. Elective, first semester. Two to ten semester credits. Prerequisites: Consult instructors. Professor Kneeland, and Assistant Professors Leazenby and Carp.

An individual research problem is investigated in the field of household administration, institutional administration, child welfare, or family welfare. The work of the course may form part or all of the basis for the master's thesis.

306. RESEARCH IN HOUSEHOLD ECONOMICS II. Elective, second semester. Two to ten semester credits. Prerequisites: Consult instructors. Professor Kneeland, and Assistant Professors Leazenby and Carp.

This course may be taken as a continuation of course 301, or may be elected independently. The work of the course may form part or all of the basis for a master's thesis.

Home Economics in the Summer School

In addition to instruction in various branches of home economics available to teachers during the regular College year, the College offers several courses in this subject in the Summer School. Instruction in these courses is intended to present correctly that which may be introduced successfully into graded schools and high schools. Students will be enrolled upon presentation of a teacher's certificate, or of a certified statement showing that two years' high-school work or its equivalent has been completed.

A special circular giving in detail the courses offered in the Summer School may be had by applying to the vice president of the College. See, also, the article on Summer School in this catalogue.

Special Courses in Home Economics

The housekeepers' course, which is completed in fifteen weeks or less and is given each semester, and the one-year curriculum in lunch-room management are to be found grouped and described with other special courses in another part of this catalogue. They may be found by reference to the general index in the back of this book.

The Division of General Science

JULIUS TERRASS WILLARD, *Dean*

In the class of colleges to which this institution belongs the classical studies of the older type of college are replaced by work in the sciences and in vocational subjects. A sound basis for technical training includes thorough training in mathematics, physical science, and biological science. It is believed also that education should include some preparation for the discharge of one's duties to the state and to the community in which he lives. It should afford him that discipline and culture which alone can give him a grasp of the relations among persons and activities, peoples and events, with breadth of view and tolerance of attitude, and hence an influence over his associates and fellow citizens of every station in life.

It is the province of the departments grouped in this division of the College to give this basic, scientific, cultural and disciplinary training. Their work is not only foundational, but it penetrates through all of the characteristic vocational courses of the institution, as the structural steel of the modern skyscraper penetrates the entire building and forms a secure framework and support for the more readily visible, and evidently important parts. These departments thus give unity to all of the four-year curricula, although presenting but few curricula that are distinctive of their own work. These, however, by means of electives and options, are susceptible of manifold modification and application.

CURRICULUM IN GENERAL SCIENCE

The curriculum in general science includes the fundamental training in English, mathematics, science, history, economics, military science, and physical training required in the several specialized vocational courses now offered by the College and chosen by the great body of our students. Its required subjects constitute the central educational basis of the institution. By means of a number of groups of electives, it gives an opportunity to students to advance themselves still further in these fundamental lines and to give special attention to some, instead of taking the technical subjects characterizing other courses. This opportunity meets the needs of several types of young people, among whom are: (1) Those who have not yet fully decided as to their vocation, but who wish an education that is strong and well balanced in respect to modern science and cultural subjects, as a foundation for further education or as a preparation for sound citizenship and intellectual satisfaction in life. (2) Those who are looking forward to teaching in the high schools of the state. The electives offered allow one to give special attention to mathematics, physical science, biological science, agriculture, home economics, history, economics, English, journalism, music, professional educational subjects, and several other lines. (3) Those who are fitting themselves for research work in the sciences, especially as applied to agriculture, engineering, and other industries.

The elective groups offered in this curriculum are to a considerable extent made up of studies required in one or more of the specialized curricula. They provide also, however, advanced work not included in other curricula. The scientific work in connection with the Agricultural and Engineering Experiment Stations, and several fields of state investigation and service, calls for the operation of unusually well-equipped departments in the sciences, and excellent facilities for practical training in this work are thus afforded.

While the curriculum in general science offers a wide choice of electives, these may not be selected aimlessly, or with the idea of choosing the easiest,

or of obtaining credit for miscellaneous subjects taken elsewhere or in other curricula. The studies of the freshman and sophomore years are basic and are required of all, without exception. They insure a broad and adequate foundation for subsequent work in the several lines of electives. The electives are to be chosen in groups, approved by the Faculty or by the dean of the Division of General Science, and in such manner as to give logical coherence to the curriculum as a whole. The elective portion of the curriculum, as thus made up, consists for the most part of several groups of two or more full studies or their equivalent. It is possible to include some single subjects that may be advantageously taken without others. Special combinations in sewing, cooking, and shop work have been planned to meet the needs of prospective teachers of manual training. Students changing from other curricula to that in general science receive credit for work done in the other curricula in so far as it can be fitted into the general plan of this one.

The curriculum in general science is thus many in one. Such various combinations of groups are possible that it is not practicable to print all of them in extended form. There are, therefore, formally presented here the required subjects of the curriculum in their specified order by years and semesters, together with a considerable number of groups of electives.

CURRICULUM IN INDUSTRIAL JOURNALISM

Knowledge is power only as it comes into the possession of those who can use it; it gives pleasure in direct proportion to the extent of its diffusion. A discovery is of but little value as long as the discoverer is the only one who knows of its existence, and the printed page is by far the most effective means of extending knowledge concerning it. Magazines and newspapers never sleep, nor do they take vacations, and their power to elevate mankind is incalculable. But printed knowledge becomes effective only as it is read, and to be widely read in this day it must stand out from the great mass of other matter and gain the attention and hold the interest of the reader. To do this its points must be sharp and easily seen, and the style must be attractive. On the other hand, if the presentation is not essentially true, the more attractive it is the worse it is, and the greater the harm that follows wide reading of it.

The curriculum in industrial journalism endeavors to give young men and women training which will enable them to write both truthfully and effectively, particularly upon industrial subjects. To such subjects the modern newspaper and the general magazine are giving constantly more attention, while there are also 500 agricultural publications and a greater number of class and trade publications which are largely or exclusively concerned with matters relating to industrial life. The training given by the College has enabled a goodly number of alumni to do successful work upon these publications.

The aim of the curriculum is to present such subjects as will enable the writer to see his work in proper perspective, to obtain authoritative knowledge of some field of industrial activity, and to write acceptably. The curriculum consequently offers, in the first place, fundamental studies of literary, social, and scientific character. Because of the materials with which journalism deals, it is highly desirable that the student obtain a clear knowledge of the social sciences and be able to read at least one current foreign language. Every student in the course is strongly urged to elect Spanish, French or German. In the second place, the student is required to elect subjects in agriculture, mechanic arts, applied science, or home economics, depending on the portion of the field of industrial journalism which he desires to enter, it being expected that every student graduated from the curriculum shall have special knowledge of some prominent line of industry. In the third place, the theory and practice of journalism are presented in a series of courses extending throughout the sophomore, junior, and senior years, and opportunity is offered for taking additional electives in journalism simultaneously with the required courses.

The College thus affords preparation for work in a wide and inviting field.

Our unprecedented industrial achievements have been made by the application of discoveries in physical and biological science. Much of discovery and much of application are yet to come, and one who can write truthfully and attractively of that which is, and of that which comes, will find ample reward.

CURRICULA IN APPLIED CHEMISTRY

The facilities for instruction in chemistry are ample, and the demand of students for curricula planned especially to give chemical training is such that formulations have been made to meet the needs of those desiring to specialize in agricultural chemistry, biochemistry, or industrial chemistry. By suitable modifications of the curriculum in industrial chemistry the needs of students interested in chemical engineering are met. The instructional facilities of the Department of Chemistry reinforced by opportunities for practical work in connection with the researches of the experiment stations are such as to provide amply for this specialized training.

CURRICULUM IN RURAL COMMERCE

The commercial prosperity of Kansas depends primarily upon the business success of its farming population. The success of the farmer is determined to a large extent by his relations with those who handle his products or furnish him with goods and services. The towns of the state and the strictly rural districts about them constitute an economic unit, the members of which are mutually dependent. A knowledge of the economic, financial, social, and business principles affecting the country and the towns in themselves and in their interrelations is of the greatest importance. The curriculum in rural commerce is designed primarily to train men and women for citizenship and business service in these communities.

The completion of this curriculum should not only enable one to conduct his own business more successfully, but give him an insight into the problems of others in their occupations. A general diffusion of such knowledge promotes tolerance, consideration for the general public with which each deals, and social unity.

Choice of electives is rather free in this curriculum, and any agricultural, industrial, commercial or social subjects of study will be approved if they are chosen in such relationships as to give promise of usefulness.

CURRICULA IN MUSIC

A knowledge of music contributes to the satisfaction in life of practically all cultivated people. This College throughout its history has maintained a department of music for the purpose of affording culture in this art to any of its students. In recent years the excellence of the instruction offered has created a demand for music curricula.

A two-year curriculum is now offered in public-school music, which leads to a certificate, and four-year curricula in voice, piano or violin lead to the degree of bachelor of music. Students completing three years of one of the four-year curricula may be awarded a certificate in applied music. More detailed information concerning these curricula will be found in connection with the exposition of the work of the Department of Music.

Curriculum in General Science

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester.	
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Chemistry I Chem. 101	5(3-6)	Chemistry II Chem. 102	5(3-6)
Plane Trigonometry* Math. 101	3(3-0)	College Algebra* Math. 104	3(3-0)
General Botany I Bot. 101	3(1-4, 2)	General Botany II Bot. 105	3(1-4, 2)
Current History Hist. 126	1(1-0)	Current History Hist. 126	1(1-0)
Library Methods Lib. Ec. 101	1(1-0)	Elective †	2(-)
Infantry I (Men) Mil. Tr. 101	1(0-4)	Infantry II (Men) Mil. Tr. 102	1(0-4)
Physical Education M-I Phys. Ed. 103	R(0-2) *or*	Physical Education M-II Phys. Ed. 104	R(0-2) *or*
Physical Education W-I Phys. Ed. 151A	1(0-3)	Physical Education W-II Phys. Ed. 152A	1(0-3)

SOPHOMORE

First Semester		Second Semester.	
English Literature I Engl. 171	4(4-0)	English Literature II Engl. 174	4(4-0)
English History Hist. 121	3(3-0)	Modern Europe Hist. 223	3(3-0)
General Physics I Physics 135	4(3-3)	General Physics II Physics 140	4(3-3)
General Zoölogy Zoöl. 105	5(3-6)	Elective†	6(-)
Infantry III (Men) Mil. Tr. 103	1(0-4)	Infantry IV (Men) Mil. Tr. 104	1(0-4)
Physical Education M-III (Men) Phys. Ed. 105	R(0-2) *or*	Physical Education M-IV (Men) Phys. Ed. 106	R(0-2) *or*
Physical Education W-III (Women) Phys. Ed. 153	1(0-3)	Physical Education W-IV (Women) Phys. Ed. 154	1(0-3)

JUNIOR

First Semester		Second Semester.	
American Government Hist. 151	3(3-0)	American History I Hist. 101	3(3-0)
Psychology C Educ. 103	3(3-0)	Economics Econ. 101	3(3-0)
Extempore Speech I Pub. Spk. 106	2(2-0)	General Microbiology Bact. 101	3(1-6)
Elective †	8(-)	Elective†	8(-)

SENIOR

First Semester		Second Semester.	
Elective †	16(-)	Elective †	16(-)

* Students who offer but one unit of Algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing trigonometry, current history, and library methods until the second semester. The additional credits are applied against electives.

† Electives are to be chosen, with the advice and approval of the dean, in groups of not less than eight semester credits, or in courses which extend fields already entered in the required work.

Curriculum in Industrial Journalism

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester.	
College Rhetoric I		College Rhetoric II	
Engl. 101	3(3-0)	Engl. 104	3(3-0)
Chemistry I		Chemistry II	
Chem. 101	5(3-6)	Chem. 102	5(3-6)
Principles of Typography I		Principles of Typography II	
Ind. Jour. 101	3(2-3)	Ind. Jour. 104	3(2-3)
Library Methods		Current History	
Lib. Ec. 101	1(1-0)	Hist. 126	1(1-0)
Current History			
Hist. 126	1(1-0)		
Options*	3(-)	Options*	5(-)
Industrial Journalism Lecture	R	Industrial Journalism Lecture	R
Infantry I (Men)		Infantry II (Men)	
Mil. Tr. 101	1(0-4)	Mil. Tr. 102	1(0-4)
Physical Education M-I		Physical Education M-II	
Phys. Ed. 103	R(0-2) *or*	Phys. Ed. 104	R(0-2)*or*
Physical Education W-I		Physical Education W-II	
Phys. Ed. 151A	1(0-3)	Phys. Ed. 152A	1(0-3)

SOPHOMORE

First Semester		Second Semester.	
English Literature I		English Literature II	
Engl. 171	4(4-0)	Engl. 14	4(4-0)
General Zoölogy		General Botany II	
Zoöl. 105	5(3-6) *or*	Bot. 105	3(1-4, 2) *or*
General Botany I		General Microbiology	
Bot. 101	3(1-4, 2)	Bact. 101	3(1-6) *if*
		General Botany I is chosen the first semester.	
Elementary Journalism		Industrial Writing	
Ind. Jour. 151	2(2-0)	Ind. Jour. 157	2(2-0)
Journalism Practice I		Journalism Practice II	
Ind. Jour. 154	2(0-6)	Ind. Jour. 160	2(0-6)
French I		French II	
Mod. Lang. 151	3(3-0) *or*	Mod. Lang. 152	3(3-0) *or*
Spanish I		Spanish II	
Mod. Lang. 176	3(3-0)	Mod. Lang. 177	3(3-0)
Options*	1 or 3(-)	Options*	6 or 3(-)
Industrial Journalism Lectures	R	Industrial Journalism Lectures	R
Infantry III (Men)		Infantry IV (Men)	
Mil. Tr. 103	1(0-4)	Mil. Tr. 104	1(0-4)
Physical Education M-III (Men)		Physical Education M-IV (Men)	
Phys. Ed. 105	R(0-2) *or*	Phys. Ed. 106	R(0-2) *or*
Physical Training W-III (Women)		Physical Training W-IV (Women)	
Phys. Ed. 154	1(0-3)	Phys. Ed. 154	1(0-3)

* The options and electives are chosen with the advice and approval of the dean. The options are in two general groups, of eighteen semester credits each: (1) social science, and (2) courses related to an industry or applied science. In the tabulated presentation of electives for students in the Division of General Science, groups may be found that will be accepted as the required option and electives. Group 31 (applied science), group 32 (home economics), group 35 (agriculture), group 36 (architecture), or group 37 (manual training), may be chosen in satisfaction of the eighteen hours required related to an industry or applied science. From group 30, eighteen hours are to be chosen in satisfaction of the social science option. The options taken in the freshman year, and a large part of those in the sophomore year, must be those related to an industry or applied science.

The electives are to be chosen in groups of usually not fewer than eight semester credits. unless they are courses which extend fields already entered through the required subjects or the options.

JUNIOR

First Semester		Second Semester.	
Industrial Feature Writing I		Industrial Feature Writing II	
Ind. Jour. 167	2(2-0)	Ind. Jour. 171	2(2-0)
Journalism Practice III		Journalism Practice IV	
Ind. Jour. 175	2(0-6)	Ind. Jour. 183	2(0-6)
Extempore Speech I		Principles of Advertising	
Pub. Spk. 106	2(2-0)	Ind. Jour. 179	3(3-0)
Options and Electives*	10(-)	Options and Electives*	9(-)
Industrial Journalism Lectures	R	Industrial Journalism Lectures	R

SENIOR

First Semester		Second Semester.	
Circulation and Advertising Promotion		Editorial Practice	
Ind. Jour. 251	3(3-0)	Ind. Jour. 257	2(2-0)
Copy Reading		Ethics of Journalism	
Ind. Jour. 254	2(0-6)	Ind. Jour. 260	2(2-0)
Electives and Options*	11(-)	Electives and Options*	11(-)
Industrial Journalism Lectures	R	Industrial Journalism Lectures	R

Curriculum in Agricultural Chemistry

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester.	
College Rhetoric I		College Rhetoric II	
Engl. 101	3(0-3)	Engl. 104	3(3-0)
Chemistry I		Chemistry II	
Chem. 101	5(3-6)	Chem. 102	5(3-6)
Plane Trigonometry*		College Algebra*	
Math. 101	3(3-0)	Math. 104	3(3-0)
General Zoölogy I		General Botany I	
Zoöl. 105	5(3-6)	Bot. 101	3(1-4, 2)
Library Methods		Engineering Drawing	
Lib. Ec. 101	1(1-0)	Ap. Mech. 155	2(0-6)
Infantry I (Men)		Infantry II (Men)	
Mil. Tr. 101	1(0-4)	Mil. Tr. 102	1(0-4)
Physical Education M-I		Physical Education M-II	
Phys. Ed. 103	R(0-2) *or*	Phys. Ed. 104	R(0-2) *or*
Physical Education W-I		Physical Education W-II	
Phys. Ed. 151A	1(0-3)	Phys. Ed. 152A	1(0-3)

SOPHOMORE

First Semester		Second Semester.	
Organic Chemistry I		Organic Chemistry II	
Chem. 218	4(2-6)	Chem. 219	4(2-6)
Plane Analytical Geometry		Calculus	
Math. 110	4(4-0)	Math. 119	3(3-0)
Engineering Physics I		Engineering Physics II	
Physics 145	5(4-3)	Physics 150	5(4-3)
General Botany II		Quantitative Analysis	
Bot. 105	3(1-4, 2)	Chem. 241	5(1-12)
Business Law I			
Hist. 163	1(1-0)		
Infantry III (Men)		Infantry IV (Men)	
Mil. Tr. 103	1(0-4)	Mil. Tr. 104	1(0-4)
Physical Education M-III (Men)		Physical Education M-IV (Men)	
Phys. Ed. 105	R(0-2) *or*	Phys. Ed. 106	R(0-2) *or*
Physical Education W-III (Women)		Physical Education W-IV (Women)	
Phys. Ed. 153	1(0-3)	Phys. Ed. 154	1(0-3)

* See footnote on previous page.

* See footnote under Curriculum in General Science.

JUNIOR

First Semester		Second Semester.	
German I Mod. Lang. 101	3(3-0)	German II Mod. Lang. 102	3(3-0)
Inorganic Preparations Chem. 202	2(0-6)	History of Chemistry Chem. 208	1(1-0)
		Food Analysis Chem. 257	3(0-9)
Physical Chemistry Chem. 206	5(3-6)	Soil Fertility Agron. 132	3(2-3)
		American Government Hist. 151	3(3-0)
Agricultural Microbiology Bact. 106	3(1-6)		
Soils Agron. 131	4(3-3)	Elective†	4(-)

SENIOR

First Semester		Second Semester.	
Comparative Physiology I Anat. 121	5(4-3)	Economics Econ. 101	3(3-0)
Chem. of Soils and Fertilizers Chem. 252	3(1-6)	Chemistry of Crops Chem. 253	3(1-6)
Scientific German I Mod. Lang. 237	4(4-0)		
Electives †	4(-)	Electives †	10(-)
Thesis	R	Thesis	R

Curriculum in Biochemistry

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester.	
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Chemistry I Chem. 101	5(3-6)	Chemistry II Chem. 102	5(3-6)
Plane Trigonometry* Math. 101	3(3-0)	College Algebra* Math. 104	3(3-0)
General Zoölogy I Zoöl. 105	5(3-6)	General Botany I Bot. 101	3(1-4, 2)
Library Methods Lib. Ec. 101	1(1-0)	Engineering Drawing Ap. Mech. 155	2(0-6)
Infantry I (Men) Mil. Tr. 101	1(0-4)	Infantry II (Men) Mil. Tr. 102	1(0-4)
Physical Education M-I Phys. Ed. 103	R(0-2) *or*	Physical Education M-II Phys. Ed. 104	R(0-2) *or*
Physical Education W-I Phys. Ed. 151A	1(0-3)	Physical Education W-II Phys. Ed. 152A	1(0-3)

* Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing trigonometry, current history, and library methods until the second semester. The additional credits are applied against electives.

† Electives are to be chosen, with the advice and approval of the dean, in groups of not less than eight semester credits, or in courses which extend fields already entered in the required work.

SOPHOMORE

First Semester		Second Semester.	
Organic Chemistry I Chem. 218	4(2-6)	Organic Chemistry II Chem. 219	4(2-6)
Plane Analytical Geometry Math. 110	4(4-0)	Calculus Math. 119	3(3-0)
Engineering Physics I Physics 145	5(4-3)	Engineering Physics II Physics 150	5(4-3)
General Botany II Bot. 105	3(1-4, 2)	Quantitative Analysis Chem. 241	5(1-12)
Business Law I Hist. 163	1(1-0)		
Infantry III (Men) Mil. Tr. 103	1(0-4)	Infantry IV (Men) Mil. Tr. 104	1(0-4)
Physical Education M-III (Men) Phys. Ed. 105	R(0-2) *or*	Physical Education M-IV (Men) Phys. Ed. 106	R(0-2) *or*
Physical Education W-III (Women) Phys. Ed. 153	1(0-3)	Physical Education W-IV (Women) Phys. Ed. 154	1(0-3)

JUNIOR

First Semester		Second Semester	
German I Mod. Lang. 101	3(3-0)	German II Mod. Lang. 102	3(3-0)
Inorganic Preparations Chem. 202	2(0-6)	History of Chemistry Chem. 208	1(1-0)
Physical Chemistry Chem. 206	5(3-6)	General Microbiology Bact. 101	3(1-6)
Histology Path. 101	3(1-6)	American Government Hist. 151	3(3-0)
Comparative Physiology I Anat. 121	5(4-3)	Elective†	5(-)

SENIOR

First Semester		Second Semester	
Physiological Chemistry I Chem. 232	5(3-6)	Physiological Chemistry II Chem. 233	5(3-6)
Organic Preparations Chem. 223	5(0-15)	Biochemical Preparations Chem. 234	5(0-15)
Economics Econ. 101	3(3-0)	Pathogenic Bacteriology I Bact. 111	4(2-6)
Scientific German I Mod. Lang. 237	4(4-0)	Elective†	2(-)
Thesis	R	Thesis	R

Curriculum in Industrial Chemistry

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester	
College Rhetoric I		College Rhetoric II	
Engl. 101	3(3-0)	Engl. 104	3(3-0)
Chemistry I		Chemistry II	
Chem. 101	5(3-6)	Chem. 102	5(3-6)
Plane Trigonometry*		College Algebra*	
Math. 101	3(3-0)	Math. 104	3(3-0)
Engineering Drawing		Descriptive Geometry	
Ap. Mech. 155	2(0-6)	Ap. Mech. 158	2(0-6)
Library Methods		Mechanical Drawing I	
Lib. Ec. 101	1(1-0)	Ap. Mech. 161	2(0-6)
Engineering Woodwork I		Business Law I	
Shop 101	1(0-3)	Hist. 163	1(1-0)
Forging I			
Shop 150	1(0-3)		
Infantry I (Men)		Infantry II (Men)	
Mil. Tr. 101	1(0-4)	Mil. Tr. 102	1(0-4)
Physical Education M-I		Physical Education M-II	
Phys. Ed. 103	R(0-2) *or*	Phys. Ed. 104	R(0-2) *or*
Physical Education W-I		Physical Education W-II	
Phys. Ed. 151A	1(0-3)	Phys. Ed. 152A	1(0-3)

SOPHOMORE

First Semester		Second Semester	
Organic Chemistry I		Organic Chemistry II	
Chem. 218	4(2-6)	Chem. 219	4(2-6)
Plane Analytical Geometry		Calculus	
Math. 110	4(4-0)	Math. 119	3(3-0)
Engineering Physics I		Engineering Physics II	
Physics 145	5(4-3)	Physics 150	5(4-3)
Adv. Inorg. Chemistry		Quantitative Analysis	
Chem. 207	3(3-0)	Chem. 241	5(1-12)
Infantry III (Men)		Infantry IV (Men)	
Mil. Tr. 103	1(0-4)	Mil. Tr. 104	1(0-4)
Physical Education M-III (Men)		Physical Educatiòn M-IV (Men)	
Phys. Ed. 105	R(0-2) *or*	Phys. Ed. 106	R(0-2) *or*
Physical Education W-III (Women)		Physcial Education W-IV (Women)	
Phys. Ed. 153	1(0-3)	Phys. Ed. 154	1(0-3)

* Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing trigonometry, current history, and library methods until the second semester. The additional credits are applied against electives.

† Electives are to be chosen, with the advice and approval of the dean, in groups of not less than eight semester credits, or in courses which extend fields already entered in the required work.

JUNIOR

First Semester		Second Semester	
German I Mod. Lang. 101	3(3-0)	German II Mod. Lang. 102	3(3-0)
Inorganic Preparations Chem. 202	2(0-6)		
Physical Chemistry Chem. 206	5(3-6)		
		History of Chemistry Chem. 208	1(1-0)
Fire Assaying Chem. 242	2(0-6)	Industrial Electrochemistry Chem. 205	2(2-0)
Gas Analysis Chem. 243	1(0-3)	Electrical Engineering C Elect. Engr. 160, 165	3(2-2, 1)
Elective †	3(-)	Elective †	7(-)

SENIOR

First Semester		Second Semester	
American Government Hist. 151	3(3-0)	Economics Econ. 101	3(3-0)
Industrial Chemistry I Chem. 203	5(3-6)	Industrial Chemistry II Chem. 204	5(3-6)
Scientific German I Mod. Lang. 237	4(4-0)		
Electives †	4(-)	Electives †	8(-)
Thesis	R	Thesis	R

Curriculum in Public School Music

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FIRST YEAR

First Semester		Second Semester	
Voice A-I Mus. 161A	2(1-6)	Voice A-II Mus. 161B	2(1-6)
Piano B-I Mus. 174A	1(½-6)	Piano B-II Mus. 174B	1(½-6)
School Music Methods I Mus. 120	2(2-0)	School Music Methods II Mus. 121	2(2-0)
Harmony I Mus. 101	2(2-0)	Harmony II Mus. 102	2(2-0)
Ear Training and Sight Singing I Mus. 105	2(2-0)	Ear Training and Sight Singing II Mus. 106	2(2-0)
Psychology B Educ. 102	3(3-0)	Methods of Teaching Educ. 111	3(3-0)
Choral Society I Mus. 190A	1(1-0)	Choral Society II Mus. 190B	1(1-0)
Musical Appreciation I Mus. 115	R(0-1)	Musical Appreciation II Mus. 116	R(0-1)
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Infantry I (Men) Mil. Tr. 101	1(0-4)	Infantry II (Men) Mil. Tr. 102	1(0-4)
Physical Education M-I Phys. Ed. 103	R(0-2) *or*	Physical Education M-II (Men) Phys. Ed. 104	R(0-2) *or*
Physical Education W-I Phys. Ed. 151A	1(0-3)	Physical Education W-II (Women) Phys. Ed. 152A	1(0-3)

SECOND YEAR

First Semester		Second Semester	
Voice A-III		Voice A-IV	
Mus. 161C	2(1-6)	Mus. 161D	2(1-6)
Piano B-III		Piano B-IV	
Mus. 174C	1(½-6)	Mus. 174D	1(½-6)
School Music Methods III		School Music Methods IV	
Mus. 122	2(2-0)	Mus. 123	2(2-0)
Harmony III		Harmony IV	
Mus. 103	2(2-0)	Mus. 104	2(2-0)
Choral Society III		Choral Society IV	
Mus. 190C	1(1-0)	Mus. 190D	1(1-0)
History of Music I		History of Music II	
Mus. 110	2(2-0)	Mus. 111	2(2-0)
Educational Administration		American Literature	
Educ. 105	3(3-0)	Educ. 280	3(3-0)
Instrumentation		Conducting	
Mus. 130	2(2-0)	Mus. 117	1(1-0)
Infantry III (Men)		Infantry IV (Men)	
Mil. Tr. 103	1(0-4)	Mil. Tr. 104	1(0-4)
Physical Education M-III (Men)		Physical Education M-IV (Men)	
Phys. Ed. 105	R(0-2) *or*	Phys. Ed. 106	R(0-2) *or*
Physical Education W-III (Women)		Physical Education W-IV (Women)	
Phys. Ed. 153	1(0-3)	Phys. Ed. 154	1(0-3)

Curriculum in Voice

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours of recitation each week; the second shows the number of hours to be spent in laboratory work each week; and the third, where there is one, indicates the number of hours of outside work in connection with the laboratory required each week.

FRESHMAN

First Semester		Second Semester	
Voice I		Voice II	
Mus. 160A	4(1-12)	Mus. 160B	4(1-12)
Piano A-I		Piano A-II	
Mus. 172A	2(1-6)	Mus. 172B	2(1-6)
Harmony I		Harmony II	
Mus. 101	2(2-0)	Mus. 102	2(2-0)
Ear Training and Sight Singing I		Ear Training and Sight Singing II	
Mus. 105	2(2-0)	Mus. 106	2(2-0)
Musical Appreciation I		Musical Appreciation II	
Mus. 115	R(0-1)	Mus. 116	R(0-1)
Ensemble I		Ensemble II	
Mus. 190A, 193A, *or* 196A,	1(1-0)	Mus. 190B, 193B, *or* 196B,	1(1-0)
College Rhetoric I		College Rhetoric II	
Engl. 101	3(3-0)	Engl. 104	3(3-0)
		Harmonics	
		Physics 222	2(2-0)
Infantry I (Men)		Infantry II (Men)	
Mil. Tr. 101	1(0-4)	Mil. Tr. 102	1(0-4)
Physical Education M-I		Physical Education M-II	
Phys. Ed. 103	R(0-2) *or*	Phys. Ed. 104	R(0-2) *or*
Physical Education W-I		Physical Education W-II	
Phys. Ed. 151A	1(0-3)	Phys. Ed. 152A	1(0-3)

SOPHOMORE

First Semester		Second Semester	
Voice III Mus. 160C	4(1-12)	Voice IV Mus. 160D	4(1-12)
Piano A-III Mus. 172C	2(1-6)	Piano A-IV Mus. 172D	2(1-6)
Harmony III Mus. 103	2(2-0)	Harmony IV Mus. 104	2(2-0)
History of Music I Mus. 110	2(2-0)	History of Music II Mus. 111	2(2-0)
Ensemble III Mus. 190C, 193C, *or* 196C,	1(1-0)	Ensemble IV Mus. 190D, 193D, *or* 196D,	1(1-0)
Recital I Mus. 184A	1(0-0)	Recital II Mus. 184B	1(0-0)
German I Mod. Lang. 101	3(3-0)	German II Mod. Lang. 102	3(3-0)
Infantry III (Men) Mil. Tr. 103	1(0-4)	Infantry IV (Men) Mil. Tr. 104	1(0-4)
Physical Education M-III (Men) Phys. Ed. 105	R(0-2)*or*	Physical Education M-IV (Men) Phys. Ed. 106	R(0-2)*or*
Physical Education W-III (Women) Phys. Ed. 153	1(0-3)	Physical Education W-IV (Women) Phys. Ed. 154	1(0-3)

JUNIOR

First Semester		Second Semester	
Voice V Mus. 160E	4(1-12)	Voice VI Mus. 160F	4(1-12)
Repertoire I Mus. 186A	2(2-0)	Repertoire II Mus. 186B	2(2-0)
Counterpoint Mus. 107	2(2-0)	Musical Form and Analysis Mus. 109	2(2-0)
Ensemble V Mus. 190E, 193E, *or* 196E,	1(1-0)	Ensemble VI Mus. 190F, 193F, *or* 196F,	1(1-0)
Recital III Mus. 184C	1(0-0)	Recital IV Mus. 184D	2(2-0)
Psychology B Educ. 102	3(3-0)	Educational Psychology Educ. 109	3(3-0)
Conducting Mus. 117	1(1-0)	Practice Teaching	2(2-0)
Electives	2(2-0)	Electives	2(2-0)

SENIOR

First Semester		Second Semester	
Voice VII Mus. 160G	4(1-12)	Voice VIII Mus. 160H	4(1-12)
Instrumentation Mus. 130	2(2-0)	Orchestration Mus. 133	2(2-0)
Ensemble VII Mus. 190G, 193G *or* 196 G,	1(1-0)	Ensemble VIII Mus. 190H, 193H, *or* 196H,	1(1-0)
Recital V Mus. 184E	1(0-0)	Recital VI Mus. 184F	2(2-0)
English Lit. I Eng. 171	4(4-0)		
French I Mod. Lang. 151	3(3-0)	French II Mod. Lang. 151	3(3-0)
Repertoire III Mus. 186C	2(2-0)	Repertoire IV Mus. 186D	2(2-0)

Curriculum in Piano

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester	
Piano I		Piano II	
Mus. 170A	6(1-24)	Mus. 170B	6(1-24)
Harmony I		Harmony II	
Mus. 101	2(2-0)	Mus. 102	2(2-0)
Ear Training and Sight Singing I		Ear Training and Sight Singing II	
Mus. 105	2(2-0)	Mus. 106	2(2-0)
Musical Appreciation I		Musical Appreciation II	
Mus. 115	R(0-1)	Mus. 116	R(0-1)
Ensemble I		Ensemble II	
Mus. 190A, 193A, *or* 196A,	1(1-0)	Mus. 190B, 193B, *or* 196B,	1(1-0)
College Rhetoric I		College Rhetoric II	
Eng. 101	3(3-0)	Eng. 104	3(3-0)
		Harmonics	
		Physics 222	2(2-0)
Piano Ensemble I		Piano Ensemble II	
Mus. 174A	R(1-0)	Mus. 174B	R(1-0)
Infantry I (Men)		Infantry II (Men)	
Mil. Tr. 101	1(0-4)	Mil. Tr. 102	1(0-4)
Physical Education M-I (Men)		Physical Education M-II (Men)	
Phys. Ed. 103	R(0-2)*or*	Phys. Ed. 104	R(0-2)*or*
Physical Education W-I (Women)		Physical Education W-II (Women)	
Phys. Ed. 151A	1(0-3)	Phys. Ed. 152A	1(0-3)

SOPHOMORE

First Semester		Second Semester	
Piano III		Piano IV	
Mus. 170C	6(1-24)	Mus. 170D	6(1-24)
Harmony III		Harmony IV	
Mus. 103	2(2-0)	Mus. 104	2(2-0)
History of Music I		History of Music II	
Mus. 110	2(2-0)	Mus. 111	2(2-0)
Ensemble III		Ensemble IV	
Mus. 190C, 193C, *or* 196C,	1(1-0)	Mus. 190D, 193D, *or* 196D,	1(1-0)
Recital I		Recital II	
Mus. 184A	1(0-0)	Mus. 184B	1(0-0)
German I		German II	
Mod. Lang. 101	3(3-0)	Mod. Lang. 102	3(3-0)
Piano Ensemble III		Piano Ensemble IV	
Mus. 174C	R(1-0)	Mus. 174D	R(1-0)
Infantry III (Men)		Infantry IV (Men)	
Mil. Tr. 103	1(0-4)	Mil. Tr. 104	1(0-4)
Physical Education M-III (Men)		Physical Education M-IV (Men)	
Phys. Ed. 105	R(0-2)*or*	Phys. Ed. 106	R(0-2)
Physical Education W-III (Women)		Physical Education W-IV (Women)	
Phys. Ed. 153	1(0-3)	Phys. Ed. 154	1(0-3)

JUNIOR

First Semester		Second Semester	
Piano V		Piano VI	
Mus. 170E	6(1-24)	Mus. 170F	6(1-24)
Counterpoint		Musical Form and Analysis	
Mus. 107	2(2-0)	Mus. 109	2(2-0)
Ensemble V		Ensemble VI	
Mus. 190E, 193E, *or* 196E,	1(1-0)	Mus. 190F, 193F, *or* 196F,	1(1-0)
Recital III		Recital IV	
Mus. 184C	1(0-0)	Mus. 184D	2(2-0)
Psychology B		Educational Psychology	
Educ. 102	3(3-0)	Educ. 109	3(3-0)
Normal Piano Methods		Practice Teaching	2(2-0)
Mus. 142	2(2-0)		
Piano Ensemble V		Piano Ensemble VI	
Mus. 174E	R(1-0)	Mus. 174F	R(1-0)
Conducting		Electives	2(2-0)
Mus. 117	1(1-0)		

SENIOR

First Semester		Second Semester	
Piano VII		Piano VIII	
Mus. 170G	6(1-24)	Mus. 170H	6(1-24)
Instrumentation		Orchestration	
Mus. 130	2(2-0)	Mus. 133	2(2-0)
Ensemble VII		Ensemble VIII	
Mus. 190G, 193G, *or* 196G,	1(1-0)	Mus. 190H, 193H, *or* 196H,	1(1-0)
Recital V		Recital VI	
Mus. 184E	1(1-0)	Mus. 184F	2(2-0)
English Literature I			
Eng. 171	4(4-0)		
French I		French II	
Mod. Lang. 151	3(3-0)	Mod. Lang. 152	3(3-0)
Piano Ensemble VII		Piano Ensemble VIII	
Mus. 174G	R(1-0)	Mus. 174H	R(1-0)

Curriculum in Violin

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester	
Violin I		Violin II	
Mus. 165A	4(1-12)	Mus. 165B	4(1-12)
Piano A-I		Piano A-II	
Mus. 172A	2(1-6)	Mus. 172B	2(1-6)
Harmony I		Harmony II	
Mus. 101	2(2-0)	Mus. 102	2(2-0)
Ear Training and Sight Singing I		Ear Training and Sight Singing II	
Mus. 105	2(2-0)	Mus. 106	2(2-0)
Musical Appreciation I		Musical Appreciation II	
Mus. 115	R(0-1)	Mus. 116	R(0-1)
Ensemble I		Ensemble II	
Mus. 190A, 193A, *or* 196A,	1(1-0)	Mus. 190B, 193B, *or* 196B,	1(1-0)
College Rhetoric I		College Rhetoric II	
Engl. 101	3(3-0)	Engl. 104	3(3-0)
		Harmonics	
		Physics 222	2(2-0)
Infantry I (Men)		Infantry II (Men)	
Mil. Tr. 101	1(0-4)	Mil. Tr. 102	1(0-4)
Physical Education M-I (Men)		Physical Education M-II (Men)	
Phys. Ed. 103	R(0-2)*or*	Phys. Ed. 104	R(0-2)*or*
Physical Education W-I (Women)		Physical Education W-II (Women)	
Phys. Ed. 151A	1(0-3)	Phys. Ed. 152A	1(0-3)

SOPHOMORE

First Semester

Violin III
Mus. 165C ..... 4(1-12)
Piano A-III
Mus. 172C ..... 2(1-6)
Harmony III
Mus. 103 ..... 2(2-0)
History of Music I
Mus. 110 ..... 2(2-0)
Ensemble III
Mus. 190C, 193C, *or* 196C, 1(1-0)
Recital I
Mus. 184A ..... 1(0-0)
German I
Mod. Lang. 101 ..... 3(3-0)
Infantry III (Men)
Mil. Tr. 103 ..... 1(0-4)
Physical Education M-III (Men)
Phys. Ed. 105..... R(0-2)
Physical Education W-III (Women)
Phys. Ed. 153 ..... 1(0-3)

Second Semester

Violin IV
Mus. 165D ..... 4(1-12)
Piano A-IV
Mus. 172D ..... 2(1-6)
Harmony IV
Mus. 104 ..... 2(2-0)
History of Music II
Mus. 111 ..... 2(2-0)
Ensemble IV
Mus. 190D, 193D, *or* 196D, 1(1-0)
Recital II
Mus. 184B ..... 1(0-0)
German II
Mod. Lang. 102 ..... 3(3-0)
Infantry IV (Men)
Mil. Tr. 104..... 1(0-4)
Physical Education M-IV (Men)
Phys. Ed. 106..... R(0-2)
Physical Education W-IV (Women)
Phys. Ed. 154 ..... 1(0-3)

JUNIOR

First Semester

Violin V
Mus. 165E ..... 6(1-24)
Counterpoint
Mus. 107 ..... 2(2-0)
Ensemble V
Mus. 190E, 193E, *or* 196E, 1(1-0)
Recital III
Mus. 184C ..... 1(1-0)
Psychology B
Educ. 102 ..... 3(3-0)
Violin Ensemble I
Mus. 168A ..... 2(2-0)
Conducting
Mus. 117 ..... 1(1-0)
Elective ..... 1(1-0)

Second Semester

Violin VI
Mus. 165F ..... 6(1-24)
Musical Form and Analysis
Mus. 109 ..... 2(2-0)
Ensemble VI
Mus. 190F, 193F, *or* 196F, 1(1-0)
Recital IV
Mus. 184D ..... 2(2-0)
Educational Psychology
Educ. 109 ..... 3(3-0)
Violin Ensemble II
Mus. 168B ..... 2(2-0)
Elective ..... 1(1-0)

SENIOR

First Semester

Violin VII
Mus. 165G ..... 6(1-24)
Instrumentation
Mus. 130 ..... 2(2-0)
Ensemble VII
Mus. 190G, 193G, *or* 196G, 1(1-0)
Recital V
Mus. 184E ..... 1(0-0)
English Literature I
Engl. 171 ..... 4(4-0)
French I
Mod. Lang. 151 ..... 3(3-0)

Second Semester

Violin VIII
Mus. 165H ..... 6(1-24)
Orchestration
Mus. 133 ..... 2(2-0)
Ensemble VIII
Mus. 190H, 193H, *or* 196H, 1(1-0)
Recital VI
Mus. 184F ..... 2(2-0)

French II
Mod. Lang. 152 ..... 3(3-0)

Curriculum in Rural Commerce

The Arabic numeral immediately following the name of a subject indicates the number of semester credits; the first numeral within the parentheses indicates the number of hours a week of recitation; the second shows the number of hours a week to be spent at the laboratory exercise; and the third, where there is such, indicates the number of hours a week required for outside work in connection with the laboratory.

FRESHMAN

First Semester		Second Semester	
College Rhetoric I Engl. 101	3(3-0)	College Rhetoric II Engl. 104	3(3-0)
Physical or Biological Science* 5(-) *or* 3(-)		Physical or Biological Science* 3(-) *or* 5(-)	
Modern Language*	3(3-0)	Modern Language*	3(3-0)
Plane Trigonometry* Math. 101	3(3-0)	College Algebra* Math. 104	3(3-0)
Accounting Practice I* Math. 140	3(3-0)	Accounting Practice II Math. 143	3(3-0)
Library Methods Lib. Ec. 101	1(1-0)		
Infantry I (Men) Mil. Tr. 101	1(0-4)	Infantry II (Men) Mil. Tr. 102	1(0-4)
Physical Education M-I Phys. Ed. 103	R(0-2)*or*	Physical Education M-II Phys. Ed. 104	R(0-2)*or*
Physical Education W-I Phys. Ed. 151A	1(0-3)	Physical Education W-II Phys. Ed. 152A	1(0-3)

SOPHOMORE

First Semester		Second Semester	
Commercial Correspondence Engl. 122	3(3-0)	Salesmanship, Oral and Written Engl. 123	3(3-0)
Modern Language	3(3-0)	Analysis of Statistics Math. 125	3(3-0)
Economics Econ. 101	3(3-0)*or*	Business Management Econ. 126	2(2-0)
Agl. Economics Ag. Econ. 101	3(3-0)	Business Law I-II Hist. 163, 168	2(2-0)
Psychology D Educ. 104	3(3-0)	Applied Psychology Educ. 215	2(2-0)
Extempore Speech I Pub. Spkg. 106	2(2-0)	Extempore Speech II Pub. Spkg. 108	2(2-0)
Current History Hist. 126	1(1-0)	Current History Hist. 126	1(1-0)
Electives	3(-)	Elective	3(-)
Infantry III (Men) Mil. Tr. 103	1(0-4)	Infantry IV (Men) Mil. Tr. 104	1(0-4)
Physical Education M-III (Men) Phys. Ed. 105	R(0-2)*or*	Physical Education M-IV (Men) Phys. Ed. 106	R(0-2)*or*
Physical Education W-III (Women) Phys. Ed. 153	1(0-3)	Physical Education W-IV (Women) Phys. Ed. 154	1(0-3)

* Eight hours of physical or biological science are to be elected in this curriculum, if possible in the freshman year. Subject to any prerequisites, chemistry, physics, botany, zoölogy and geology are available. In one modern language a student must attain the proficiency given by nine semester hours of College work. If the language has been studied in high school, elementary work may be avoided in College, and the time saved used for elective studies. Students who have had only one year of high-school algebra are not assigned to trigonometry, but are assigned to a five-credit course in College Algebra, Math. 107, the first semester, postponing trigonometry and library methods to the second semester. Accounting practice requires the previous study of elementary bookkeeping. Students who have not had a course in bookkeeping will be assigned to Accounting, Math. 137, for which they will be allowed credit on electives. Because of the various contingencies and elective possibilities in the sciences and modern languages, the proper planning of the work of the freshman year requires great care and foresight.

JUNIOR

First Semester		Second Semester	
Principles of Advertising Engl. 201	3(3-0)	Cost Accounting Econ. 131	2(2-0)*or*
English Literature I Engl. 171	4(4-0)	Farm Cost Accounting Ag. Econ. 111	3(3-0)
Money and Banking Econ. 116	2(2-0)	Public Finance Econ. 213	2(2-0)
Sociology Econ. 151	3(3-0)	Labor Problems Econ. 111	2(2-0)
		American Government Hist. 151	3(3-0)
Electives	3(-)	Electives	7 *or* 6(-)

SENIOR

First Semester		Second Semester	
Economic Geography Econ. 121	3(3-0)	Current Economic Problems Econ. 225	2(2-0)
Am. Industrial History Hist. 105	3(3-0) *or*	Pan America Hist. 207	2(2-0)
Am. Agricultural History Hist. 204	3(3-0)		
Elective	9(-)	Elective	11(-)

Groups of Electives and Options for Students in the Division of General Science

In addition to the courses included in the following groups, others will be found described in the exposition of the work of the respective departments. From any group elected a sufficient number of courses to constitute an effective block of knowledge must be taken. At least eight semester credits in any new field are usually required, but a smaller number will be honored if in a field already entered upon. In a modern language a student must reach a point equivalent to that obtained by college courses aggregating eight or nine semester hours.

1. English Language

First Semester		Second Semester	
Advanced Composition Engl. 113	2(2-0)	Advanced Composition II Engl. 116	2(2-0)
Commercial Correspondence Engl. 122	3(3-0)	Written and Oral Salesmanship Engl. 123	3(3-0)
Oral English I Engl. 128	3(3-0)	Oral English II Engl. 131	3(3-0)
Argumentation and Debate Engl. 119	3(3-0)	Methods of Teaching English Engl. 134	3(3-0)
The Short Story I Engl. 251	3(3-0)	The Short Story II Engl. 252	3(3-0)
		Community English Engl. 254	2(2-0)

2. English Literature

The English Bible I Engl. 271	3(3-0)	The English Bible II Engl. 272	3(3-0)
The Shaksperean Drama I Engl. 273	3(3-0)	The Shaksperean Drama II Engl. 274	3(3-0)
Nineteenth Century Literature Engl. 277	3(3-0)	American Literature Engl. 280	3(3-0)
Current Literature Engl. 282	2(2-0)	The Novel I Engl. 286	3(3-0)
English Survey I Engl. 288	2(2-0)	English Survey II Engl. 290	2(2-0)
Browning Engl. 292	3(3-0)	The Arts and Crafts Movement Engl. 295	2(2-0)

† Electives are to be chosen, with the advice and approval of the dean, in groups of not less than eight semester credits, or in courses which extend fields already entered in the required work.

3. German

First Semester		Second Semester	
German I Mod. Lang. 101	3(3-0)	German II Mod. Lang. 102	3(3-0)
German Readings Mod. Lang. 111	3(3-0)	German Short Stories Mod. Lang. 201	3(3-0)
Scientific German I Mod. Lang. 237	4(4-0)	Scientific German II Mod. Lang. 241	3(3-0)

4. French and Spanish

French I Mod. Lang. 151	3(3-0)	French II Mod. Lang. 152	3(3-0)
French Readings Mod. Lang. 161	3(3-0)	French Short Stories Mod. Lang. 251	3(3-0)
Spanish I Mod. Lang. 176	3(3-0)	Spanish II Mod. Lang. 177	3(3-0)
Spanish Readings Mod. Lang. 180	3(3-0)	Commercial Spanish Mod. Lang. 183	3(3-0)

5. Mathematics

Plane Analytical Geometry Math. 110	4(4-0)	Calculus Math. 119	3(3-0)
Calculus I Math. 113	5(5-0)	Calculus II Math. 116	3(3-0)
Analysis of Statistics Math. 125	3(3-0)	Institutional Accounting Math. 131	3(3-0)
Differential Equations Math. 201	3(3-0)	Special Methods in the Teaching of Mathematics Math. 122	3(3-0)

6. Inorganic Chemistry

Advanced Inorganic Chemistry Chem. 207	3(3-0)	Industrial Electrochemistry Chem. 205	2(2-0)
Inorganic Preparations Chem. 202	2(0-6) to 4(0-12)	Physical Chemistry Chem. 206	5(3-6)
Industrial Chemistry I Chem. 203	5(3-6)	Industrial Chemistry II Chem. 204	5(3-6)

7. Organic Chemistry

Organic Chemistry Chem. 120	3(2-3)	Organic Chemistry HE Chem. 121	5(3-6)
Organic Chemistry I Chem. 218	4(2-6)	Organic Chemistry II Chem. 219	4(2-6)
Organic Preparations Chem. 223	5(0-15)	Stereoisomeric and Tautomeric Compounds Chem. 225	2(2-0)
Qualitative Org. Analysis Chem. 224	2(0-6)	Carbocyclic and Heterocyclic Compounds Chem. 226	2(2-0)
Physiological Chemistry I Chem. 232	5(3-6)	Physiological Chemistry II Chem. 233	5(3-6)
Pathological Chemistry Chem. 235	2(2-0)	Physiological Chemistry Chem. 231	5(3-6)

8. Analytical Chemistry

Quantitative Analysis I Chem. 150	2(0-6)	Quantitative Analysis I Chem. 150	2(0-6)
Quantitative Analysis II Chem. 250	3(1-6)	Quantitative Analysis III Chem. 251	3(1-6)
Advanced Qualitative Analysis Chem. 240	3(1-6)	Household Chemistry Chem. 265	3(1-6)

9. Physics

First Semester		Second Semester	
Household Physics Physics 101	4(3-3)	Agricultural Physics Physics 111	3(3-0)
Photography Physics 120	2(1-3)	Harmonics Physics 222	2(2-0)
Molecular Physics and Heat Physics 221	4(3-3)	Special Methods in the Teaching of Physics Physics 224	3(2-3)
Wireless Telegraphy Physics 130	2(1-3)	Radioactivity and Electron Theory Physics 233	3(3-0)
Spectroscopy Physics 230	3(1-6)	Meteorology Physics 138	2(2-0)
Storage Batteries Physics 235	2(1-3)		

10. Microbiology

Agricultural Microbiology Bact. 106	3(1-6)	Soil Microbiology Bact. 201	3(1-6)
Hygienic Bacteriology Bact. 206	4(2-6)	Pathogenic Bacteriology I Bact. 111	4(2-6)
Pathogenic Bacteriology II Bact. 116	4(2-6)	Dairy Bacteriology Bact. 211	3(1-6)
Poultry Bacteriology Bact. 216	3(1-6)		

11. Botany

General Botany I Bot. 101	3(1-4, 2)		
Plant Pathology I Bot. 116	3(1-4, 2)	Plant Histology Bot. 215	2(0-6)
Mycology Bot. 204	4(2-4, 2)	Ecology Bot. 228	2(2-0)
Plant Physiology I Bot. 208	3(3-0)	Taxonomic Botany of the Flowering Plants Bot. 225	3(1-4, 2)
Fruit Crop Diseases Bot. 202	2(1-2, 1)	Field Crop and Vegetable Diseases Bot. 203	2(1-2, 1)
Botanical Problems Bot. 232	3(1-4)	Botanical Problems Bot. 232	3(1-4)

12. Zoology

Cytology Zoöl. 214	4(2-6)	Comparative Morphology of Vertebrates Zoöl. 204	5(3-6)
Parasitology Zoöl. 124	3(2-3)	Animal Ecology Zoöl. 211	3(1-6)
		Ornithology Zoöl. 127	2(1-3)
		Advanced Embryology Zoöl. 221	4(2-6)
		Embryology Zoöl. 117	3(2-3)
Heredity and Eugenics Zoöl. 216	2(2-0)	Parasites and Public Health Zoöl. 218	3(3-0)
Zoölogical Problems Zoöl. 203	1 or 2(-)	Zoölogical Problems Zoöl. 203	1 or 2(-)
Zoölogical Technic Zoöl. 206	1 or 2(-)	Zoölogical Technic Zoöl. 206	1 or 2(-)

13. Geology

		Historical Geology Geol. 201	2(2-0)
		Engineering Geology Geol. 102	4(2-6)
		General Geology Geol. 103	3(3-0)

14. Entomology

First Semester		Second Semester	
General Entomology Ent. 101	3(2-3)	General Economic Entomology Ent. 206	3(2-3)
Insect Morphology I Ent. 211	3(1-6)	Apiculture Ent. 111	3(2-3)
Advanced General Entomology Ent. 221	3(3-0)	Principles of Taxonomy Ent. 216	1(1-0)
Advanced Apiculture Ent. 228	3(2-3)	Taxonomy of Insects I Ent. 217	2(0-6)

15. History and Civics

American History II Hist. 202	3(3-0)	American History III Hist. 203	3(3-0)
American Industrial History Hist. 105	3(3-0)		
Pan-America Hist. 207	2(2-0)	Immigration and International Relations Hist. 228	2(2-0)
Modern England and the British Empire Hist. 226A	2(2-0)	Comparative Government Hist. 252	2(2-0)
American Political History Hist. 206	2(2-0)	History of the Home Hist. 225	3(3-0)

16. Law

Business Law I Hist. 153	1(1-0)	Business Law II Hist. 168	1(1-0)
		Farm Law Hist. 175	2(2-0)

17. Economics and Sociology

Economics Econ. 101	3(3-0)	Agricultural Economics Ag. Ec. 101	3(3-0)
Sociology Econ. 151	3(3-0)	Marketing of Farm Products Ag. Ec. 202	3(3-0)
Business Organization Econ. 106	1(1-0)	Money and Banking Econ. 116	2(2-0)
Labor Problems Econ. 111	2(2-0)	Public Finance Econ. 213	2(2-0)

18. Education

Educational Administration A *or* B Educ. 105 *or* 106	3(3-0)	Methods of Teaching Educ. 111	3(3-0)
History of Education A Educ. 113	3(3-0)	Educational Sociology A *or* B Educ. 118 *or* 119	3(3-0)
Rural Education Educ. 201	3(3-0)		
Psychology A, B, C *or* D Educ. 101-104	3(3-0)	Educational Psychology Educ. 109	3(3-0)
Mental Measurements Educ. 211	3(3-0)	Abnormal Psychology Educ. 213	3(3-0)
Applied Psychology Educ. 215	2(2-0)	Advanced Systematic Psychology Educ. 216	3(3-0)

19. Vocational Education

First Semester		Second Semester	
Agricultural Education Educ. 126	3(3-0)	Special Methods in the Teaching of Agriculture Educ. 136	3(3-0)
		Supervised Observation and Teaching in Agriculture Educ. 161	3(0-9)
Home Economics Education Educ. 122	3(3-0)	Special Methods in the Teaching of Home Economics Educ. 132	3(3-0)
		Supervised Observation and Teaching in Home Economics Educ. 160	3(0-9)
Industrial Education Educ. 130	3(3-0)	Special Methods in the Teaching of Industrial Arts Subjects Educ. 140	3(3-0)
		Supervised Observation and Teaching in Industrial Arts Educ. 162	3(0-9)

20. Industrial Journalism.

Elementary Journalism Ind. Jour. 151	2(2-0)	Industrial Writing Ind. Jour. 157	2(2-0)
Journalism Practice I Ind. Jour. 154	2(0-6)	Journalism Practice II Ind. Jour. 160	2(0-6)
Industrial Feature Writing I Ind. Jour. 167	2(2-0)	Industrial Feature Writing II Ind. Jour. 171	2(2-0)
Journalism Practice III Ind. Jour. 175	2(0-6)	Journalism Practice IV Ind. Jour. 183	2(0-6)
Materials of Journalism Ind. Jour. 265	2(2-0)	Magazine Features Ind. Jour. 270	2(2-0)
History of Journalism Ind. Jour. 274	2(2-0)	Journalism Surveys Ind. Jour. 278	2(0-6)

23. Music

Voice A (Music 161A to 161D)

Two private lessons a week. Two semester credits per semester.

Piano A (Music 172A to 172D)

Two private lessons a week. Two semester credits per semester.

Violin A (Music 166)

Two private lessons a week. Two semester credits per semester.

Wind Instruments (Music 182)

Two private lessons a week. Two semester credits per semester.

Harmony I Music 101	2(2-0)	Harmony II Music 102	2(2-0)
Harmony III Music 103	2(2-0)	Harmony IV Music 104	2(2-0)
Counterpoint Music 107	2(2-0)	Musical Form and Analysis Music 109	2(2-0)
History of Music I Music 110	2(2-0)	History of Music II Music 111	2(2-0)
School Music Methods I Music 120	2(-)	School Music Methods II Music 121	2(-)
School Music Methods III Music 122	2(-)	School Music Methods IV Music 123	2(-)
Choral Society Music 190A to 190H	1(1-0)	Choral Society Music 190A to 190H	1(1-0)
Orchestra Music 193A to 193H	1(1-0)	Orchestra Music 193A to 193H	1(1-0)
College Band Music 196A to 196H	1(1-0)	College Band Music 196A to 196H	1(1-0)

24. Rural Leadership

(a) For all; (b) for those preparing for work in agricultural extension; (c) for adult special students; (d) for those preparing for home economics extension.

First Semester		Second Semester	
(a) Rural Sociology Econ. 156	3(3-0)	(a) Rural Organization Econ. 264	2(2-0)
(a) Agricultural Economics Ag. Ec. 101	3(3-0)	(a) Rural Leadership Econ. 261	1(1-0)
(a) Rural Education Educ. 201	3(3-0)	(b, c) Marketing of Farm Products Ag. Ec. 202	3(3-0)
		(b, c) Agricultural Industries Ag. Ec. 211	2(2-0)
(c) Farm Advertising Engl. 201	3(3-0)	(c) Farm Bulletins Engl. 204	2(2-0)
(c) Agricultural Journalism Ind. Jour. 164	1(1-0)	(c) Adv. Public Speaking Pub. Spk. 110	1(1-0)
(c, d) Social Problems Econ. 257	2(2-0)	(c, d) Sanitation and Public Health Hshld. Ec. 211	3(3-0)
(d) Child Welfare Hshld. Ec. 203	3(3-0)	(d) Home Nursing Hshld. Ec. 109	1(0-3)

30. Social Science

American History I Hist. 101	3(3-0)	American History II *or* III Hist. 202 *or* 203	3(3-0)
American Government Hist. 151	3(3-0)		
Pan-America Hist. 207	2(2-0)		
English History Hist. 121	3(3-0)	Modern Europe Hist. 223	3(3-0)
Economics Econ. 101	3(3-0)	Agricultural Economics Ag. Ec. 101	3(3-0)
Business Organization Econ. 106	1(1-0)	Money and Banking Econ. 116	2(2-0)
Labor Problems Econ. 111	2(2-0)	Public Finance Econ. 213	2(2-0)
Sociology Econ. 151	3(3-0)	Marketing of Farm Products Ag. Ec. 202	2(2-0)
History of Journalism Ind. Jour. 274	2(2-0)	Agricultural Land Problems Ag. Ec. 218	3(3-0)

31. Applied Science

First Semester		Second Semester	
General Botany I Bot. 101	3(1-4, 2)	General Botany II Bot. 105	3(1-4, 2)
Plant Pathology I Bot. 116	3(1-4, 2)	Field Crops and Vegetable Diseases Bot. 203	2(1-2, 1)
Fruit Crop Diseases Bot. 202	2(1-2, 1)	Seed Identification and Weed Control Agron. 105	2(1-3)
Farm Forestry Hort. 113	4(3-3)	Plant Propagation Hort. 101	3(2-2, 1)
		Gardening Hort. 122	3(3-0)
		Landscape Gardening I Hort. 126	2(1-3)
General Zoölogy Zoöl. 105	5(3-6)	General Zoölogy II Zoöl. 102	3(2-3)
Parasitology Zoöl. 124	3(2-3)	Economic Zoölogy Zoöl 126	3(1-6)
Embryology and Physiology (Vet.) Zoöl. 109	5(3-6)	General Microbiology Bact. 101	3(1-6)
Hygienic Bacteriology Bact. 206	4(2-6)		
General Entomology Ent. 101	3(2-3)	General Economic Entomology Ent. 206	3(2-3)
Horticultural Entomology Ent. 201	2(2-0)	Apiculture Ent. 111	3(2-3)
Organic Chemistry (Agr.) Chem. 120	3(2-3)		
Quantitative Analysis I Chem. 150	2(0-6)		
Chemistry of Soils and Fertilizers Chem. 252	3(1-6)	Dairy Chemistry Chem. 254	3(1-6)
Chemistry of Crops Chem. 253	3(1-6)	Chemistry of Meats Chem. 255	3(1-6)
Human Nutrition Food and Nut. 112	3(3-0)	Household Chemistry Chem. 265	3(1-6)
Household Physics Physics 101	4(3-3)		
Photography Physics 120	2(1-3)	Wireless Telegraphy Physics 130	2(1-3)

32. Home Economics

Household Physics Physics 101	4(3-3)	Foods I Food and Nut. 101	3(1-6)
Organic Chemistry HE Chem. 121	5(3-6)	Household Microbiology Bact. 121	5(3-6)
Foods II Food and Nut. 106	5(3-6)	Dietetics Food and Nut. 201	5(3-6)
Human Nutrition Food and Nut. 112	3(3-0)		
Design Ap. Art. 101	3(1-6)	Clothing I Clo. and Text. 101	2(1-3)
Clothing II Clo. and Text. 111	3(1-6)	Costume Design I Clo. and Text. 106	2(0-6)
Interior Decoration and Furnishing Ap. Art. 114	3(1-6)	Textiles Clo. and Text. 116	3(2-3)
		Principles of Art and Their Application Ap. Art. 124	3(3-0)

35. Agriculture

First Semester		Second Semester	
General Botany I Bot. 101	3(1-4, 2)	General Botany II Bot. 105	3(1-4, 2)
Judging Market Live Stock An. Husb. 132	2(0-6)	Plant Propagation Hort. 101	3(2-2, 1)
Grain Crop Production Agron. 101	3(2-2, 1)	Forage Crop Production Agron. 102	3(2-2, 1)
Elements of Dairying Dairy Husb. 101	3(2-3)	Dairy Judging Dairy Husb. 104	1(0-3)
Organic Chemistry (Agr.) Chem. 120	3(2-3)	Farm Poultry Production Poult. Husb. 101	2(1-2, 1)
Plant Pathology I Bot. 116	3(1-4, 2)	Principles of Feeding An. Husb. 152	3(3-0)
Soils Agron. 131	4(3-3)	Orcharding Hort. 107	2(1-2, 1)
Quantitative Analysis I Chem. 150	2(0-6)	Soil Fertility Agron. 132	3(2-2, 1)

36. Architecture

Engineering Drawing Ap. Mech. 155	2(0-6)	Descriptive Geometry Ap. Mech. 158	2(0-6)
Architectural Drawing I Arch. 108	2(0-6)	Architectural Drawing II Arch. 109	2(0-6)
Free-hand Drawing I Arch. 111	2(0-6)	Shades and Shadows Arch. 131	1(0-3)
Design I Arch. 142	3(0-9)	Free-hand Drawing II Arch. 114	2(0-6)
		Design II Arch. 144	3(0-9)
Perspective Arch. 128	1(0-3)		

37. Manual Training

Wood Working for Grammar Grades Shop 120	2(0-6)	Wood Working I for High Schools Shop 125	2(0-6)
Wood Working II for High Schools Shop 130	2(0-6)	Wood Turning Shop 135	2(0-6)
Forging I Shop 150	1(0-3)	Forging II Shop 155	1(0-3)
Forging III Shop 186	1(0-3)	Forging IV Shop 189	1(0-3)
Foundry Practice Shop 160	1(0-3)	Pattern Making Shop 145	1(0-3)
Machine Tool Work I Shop 170	2(0-6)	Machine Tool Work II Shop 192	2(0-6)
Machine Tool Work III Shop 193	1(0-3)	Metallurgy Shop 165	2(2-0)
Farm Motors Ag. Engr. 125, 126	3(2-3)	Farm Buildings Ag. Engr. 103	3(1-6)
Mechanical Drawing I Ap. Mech. 161	2(0-6)	Surveying I Civ. Engr. 102	2(0-6)

45. Milling Industry

Organic Chemistry (Agr.) Chem. 120	3(1-6)	Quantitative Analysis III Chem. 251	3(1-6)
Quantitative Analysis II Chem. 250	3(2-3)	Principles of Milling Mill. Ind. 101	1(0-3)
Grain Crop Production Agron. 101	3(2-2, 1)	Milling Practice I Mill. Ind. 109	3(1-6)
Grain Marketing Mill. Ind. 102	3(3-0)	Grain Products Mill. Ind. 103	2(2-0)
Wheat and Flour Testing Mill. Ind. 203	4(1-9)	Experimental Baking A Mill. Ind. 204	2(0-6)
		Milling Practice II Mill. Ind. 110	2(0-6)

Bacteriology

Professor BUSHNELL
Associate Professor GAINEY
Instructor BEAUDETTE
Instructor FAY
Assistant BAKER
Fellow TUNNICLIFF

The Department of Bacteriology occupies parts of the first and second floors of Veterinary Hall. The space is divided into offices and private laboratories, an experiment station and research laboratory, a large general laboratory, incubator or temperature room, preparation room, and stock room. The laboratories are well lighted and equipped with gas, lockers, ice chests, sterilizers, wall cases, microscopes, and other modern facilities necessary for bacteriological work.

The instruction consists of lectures, recitations, demonstrations, and laboratory practice. Printed synopses of lectures and printed laboratory directions are furnished the students in some of the courses; in others textbooks are required. The department library contains textbooks on bacteriology and allied subjects, also the current files of the important technical periodicals relating to bacteriology. These are at the constant disposal of the students for reference. To those who desire graduate work the department offers excellent facilities.

Bacteriology is presented to the students as a biological science and as a practical factor in everyday life. In this subject only the simplest forms of life, consisting almost invariably of one-celled organisms, are studied. It is now possible to study these microscopical forms with ease and accuracy, thus paving the way for a more complete study and better understanding of cells in the aggregate. The second point of view from which this subject is approached is that of its practical application in agriculture, medicine, domestic science, and sanitation.

COURSES IN BACTERIOLOGY

FOR UNDERGRADUATES

101. GENERAL MICROBIOLOGY. Sophomore or junior year, second semester. Lectures, one hour; laboratory, six hours. Three semester credits. Prerequisite: Chemistry II. Professor Bushnell and Mr. Baker.

This general introductory course consists of lectures, recitations and demonstrations covering the morphological and biological characters, the classification and the distribution of bacteria, factors necessary for the development of bacteria, culture media, cultural features, staining values, and fundamental principles of applied bacteriology.

Laboratory.—The student prepares culture media and becomes familiar with principles of sterilization and incubation, and with general laboratory technic. During the last half of the semester, organisms representing the different families and genera are studied microscopically and culturally. Also preliminary quantitative and qualitative examinations are made of milk, water, soil, etc.

106. AGRICULTURAL MICROBIOLOGY. Junior year, both semesters. Lectures, one hour; laboratory, six hours. Three semester credits. Prerequisite: Organic Chemistry. Associate Professor Gainey and Mr. Fay.

This is a general course consisting of lectures, recitations and demonstrations. The relation of microörganisms to agriculture is particularly emphasized. First, information is given concerning the nature of microörganisms; their biological characteristics, classification and distribution in nature; their influence upon the plant food in the soil; their relation to certain fermentations, etc. Later some emphasis is placed upon the relation of microörganisms to disease; sources and modes of infection; use of germicidal agents and general hygienic measures.

Laboratory.—In the laboratory, the student becomes familiar with methods of cultivating and studying bacteria, yeasts and molds. Various known forms are studied; methods for the quantitative and qualitative analysis of water, milk, etc., are given some attention. Some time is given to methods of sterilization and the use of germicidal agents. The aim of this course is to give the student a general working knowledge of the subject and to point out its relation to agriculture and the problems of everyday life.

111. PATHOGENIC BACTERIOLOGY I. Sophomore year, second semester. Lectures, two hours; laboratory, six hours. Four semester credits. Prerequisite: Chemistry II. Doctor Beaudette.

This is primarily a general introductory course, consisting of lectures, demonstrations and recitations covering the distribution, the morphological and biochemical features of microörganisms; factors necessary for the development and cultivation of bacteria and the fundamental principles of the science as applied to veterinary medicine.

Laboratory.—The student first becomes acquainted with the general laboratory technic, comprising the preparation of media, methods of sterilization, incubation, inoculation, plating, isolating, and staining of bacteria. Different cultures of microörganisms are studied morphologically, culturally and biochemically. Quantitative and qualitative examinations of milk and of water are made in the latter part of the semester.

116. PATHOGENIC BACTERIOLOGY II. Junior year, first semester. Lectures, two hours; laboratory, six hours. Four semester credits. Prerequisite: Pathogenic Bacteriology I. Doctor Beaudette.

A study is made of the morphology, powers of resistanee, pathogenesis, distribution, channels of infection, and means of dissemination of pathogenic bacteria, especially those related to the specific infectious diseases of animals; epizoötic and epidemic diseases of unknown etiology are further treated. A detailed study is made of the manufacture, standardization, preparation for the market and use of vaccines, antitoxins, and other biological products related to the diagnosis, prevention, and treatment of specific infectious diseases; of susceptibility, immunity, and infection; of theories of immunity; of anaphylaxis, opsonins, precipitins, bacteriolysins, and agglutinins.

Laboratory.—A study is made of the microscopical and cultural character of pathogenic microörganisms; of laboratory animal inoculations, autopsy, and diagnosis; prevention and treatment of specific infectious diseases. Experimental production of opsonins, antitoxins, agglutinins, precipitins, and cytolysins; experiments showing the constitutions and mode of action of these antibodies; production of active and passive anaphylaxis, and of anaphylatoxin; methods for the production and standardization of biological products, such as diphtheria and tetanus antitoxin, bacterine, etc.; the application of the various phenomena of immunity in the diagnosis of infectious diseases; the identification of animal and vegetable proteins; complement fixation tests for glanders, opsonic technic, etc., comprise the laboratory work.

121. HOUSEHOLD MICROBIOLOGY. Junior year, both semesters. Lectures, three hours; laboratory, six hours. Five semester credits. Prerequisite: Elementary Organic Chemistry. Professor Bushnell and Mr. Baker.

This course consists of lectures, recitations and demonstrations relating to the classification, distribution, and the relative importance of bacteria. The morphological and biochemical characters of microörganisms are considered, together with a study of those factors necessary for the proper development of bacteria, and the fundamental principles of the science as applied to household economics. It is designed to give the student a more thorough knowledge of those microörganisms which are of importance in the household. The significance of microbial findings in the analysis of water, milk, and foods, also consideration of the conditions which tend to increase or decrease the bacterial content of food substances, are studied in detail. Some time is given to the principles of sanitation as applied to public-health problems. The class work

is a more theoretical consideration of the problems undertaken in the laboratory.

Laboratory.—General laboratory technic is first taken up consisting of preparation of media, methods and principles of sterilization, incubation, plating, isolating and staining of microörganisms. Studies consisting of the morphological, cultural, and biochemical characteristics of different organisms are made. A study of microörganisms and their activities, both beneficial and harmful, in their relation to household economy; bacteriological study of water, milk, and foods; the determination of the potability of water; milk contamination, the effect of cooling upon the bacterial content of milk, pasteurization of milk, etc.; microscopical study of yeasts and molds; the spoilage of canned vegetables and fruits; methods of food preservation; the manufacture of vinegar; study of activities of various species of microörganisms, thermal death point, the germicidal action of various disinfectants, etc., are topics taken up in the laboratory work.

FOR GRADUATES AND UNDERGRADUATES

201. Soil Microbiology. Elective, second semester. Lectures, one hour; laboratory, six hours. Three semester credits. Prerequisite: Course 101 or 106. Associate Professor Gainey.

This is an introductory course covering the principles of soil microbiology as defined at the present time, and fitting the student for independent research on microbial investigations of soil, including the influence of microbial flora, of depth and character of soil, temperature, moisture, chemical reaction, aëration, and other factors; activities of soil microörganisms, ammonification, nitrification, denitrification, symbiotic and nonsymbiotic nitrogen fixation. Various texts are recommended as reference books.

Laboratory.—The laboratory work comprises the preparation of various special culture media and reagents necessary to conduct bacteriological analyses of the soil; qualitative analysis and the laboratory study of ammonification, nitrification, denitrification, symbiotic and nonsymbiotic nitrogen fixation; plot experiments and field work illustrating the influence of various factors upon the bacterial flora, and the inoculation of soil with symbiotic nitrogen-fixing bacteria.

206. Hygienic Bacteriology. Elective, first semester. Lectures, two hours; laboratory, six hours. Four semester credits. Prerequisite: General, Agricultural, or Household Microbiology. Professor Bushnell.

Pathogenic bacteria, especially those related to disease of man; channels of infection, and means of dissemination of pathogenic bacteria; epidemics, their cause and control; isolation, disinfection, and quarantine; prophylaxis against specific infectious diseases and important precautions necessary in the control of communicable diseases are studied. Various books are recommended as textbooks.

Laboratory.—The laboratory work comprises microscopical and cultural study of pathogenic bacteria; technic involved in the diagnosis of *Bacterium tuberculosis* in sputum; the culture of pathogenic anærobic bacteria; the isolation and identification of pathogenic bacteria from animal tissues, from pus and exudates; bacteriological examination of air, water, milk, sewage; interpretation of results, etc.

211. Dairy Bacteriology. Elective, second semester. Lectures, one hour; laboratory, six hours. Three semester credits. Prerequisite: General, Agricultural, or Household Microbiology. Mr. Fay.

Consideration is given to the bacterial flora of milk, butter, and cheese; to infectious diseases conveyed through dairy products; to bacterial contamination of milk by air, water, utensils, etc.; to normal and abnormal fermentations in milk, their significance and control.

Laboratory.—The preparation of culture media necessary for dairy bacteriological work; milk contamination; quantitative and qualitative bacteriological

analyses of milk; the microscopical and cultural characters of the types of microörganisms representing the flora of milk, butter, and cheese; types of milk-fermenting organisms; the examination of cream, wash water, and separator slime; the effect of temperature on the growth of milk bacteria; pasteurization of milk; examination of milk for the presence of *Bacterium tuberculosis,* leucocytes and streptococci are taken up in the laboratory work. Various texts are recommended as reference books.

216. POULTRY BACTERIOLOGY. Elective, first semester. Lectures, one hour; laboratory, six hours. Three semester credits. Prerequisite: General or Agricultural Microbiology. Doctor Beaudette.

Consideration is given to the various microbial diseases of poultry; etiology, sources, and modes of infection; prevention and cure; to the microbial content of freshly-laid eggs, cold-storage eggs, and egg products, with conditions tending toward increase or decrease of this microbial content.

Laboratory.—Microörganisms pathogenic for poultry; artificial production, diagnosis, and control of poultry diseases; microbial content of eggs and egg preparations produced and handled under various conditions, form the subject matter of the laboratory work.

217. POULTRY DISEASES. Senior year, first semester. Lectures, two hours. Two semester credits. Prerequisites: Pathogenic Bacteriology I and II, and Therapeutics. Doctor Beaudette.

This course is designed particularly to meet the needs of the veterinarian. A brief study is first made of the anatomy of the fowl. This is followed by a study of poultry sanitation and hygiene, and a complete systematic study of the infectious diseases of all classes of domestic fowls. In this the following points are emphasized: etiology, pathogenicity, prognosis, symptoms, morbid anatomy, treatment, immunity, and prevention. Some time is given to general diseases of a noninfectious nature. A review is also made of the external and internal parasites of domestic fowls. Minor surgical operations are also considered. From time to time the student is given the opportunity to make a complete study of the various specimens that are sent into the laboratory for diagnosis.

226. BACTERIOLOGICAL PROBLEMS. Elective, both semesters and summer school. One to four semester credits. Prerequisites: Course 101, 106, 111, or 121. Professor Bushnell, Associate Professor Gainey.

Students are assigned to special problems in the various phases of the subject. The credit obtained will depend upon the amount and quality of work done.

FOR GRADUATES

301. RESEARCH BACTERIOLOGY. Elective, both semesters. Credit to be arranged. Prerequisite: At least two of the outlined courses offered by the department. Professor Bushnell, Associate Professor Gainey.

Advanced students showing sufficient training, ability and interest in original research are admitted to this course, upon approval of the head of the department. The student is under the direct supervision of a faculty member of the department, and in consultation with him the subject for investigation is chosen and outlined.

Students showing the proper interest and ability are given an opportunity to do experiment-station and advanced research work, during vacation periods, under the direct supervision of a faculty member of the department.

Students desiring to take work leading to an advanced degree are given individual research problems. After the proper completion of such an investigation, the results are presented to the graduate faculty in the form of a thesis. Such a thesis, when accepted by the faculty, fulfills part of the requirements for a Master of Science degree.

Botany and Plant Pathology

Professor MELCHERS
Professor MILLER
Associate Professor DAVIS
Assistant Professor GATES
Assistant Professor HAYMAKER
Instructor DALBEY
Instructor CASHEN
Coöperative Assistant JOHNSTON
Assistant WHITE

The instruction given in the Department of Botany and Plant Pathology has a threefold purpose:

First, to give a training in botany for the general broadening of the student's knowledge.

Second, to give the student a training in the knowledge of plants that will serve as a foundation for his further College courses in agricultural subjects.

Third, to instruct and direct those students who desire to investigate such problems in plant life as affect agriculture. Investigations may be undertaken in plant pathology, plant physiology, taxonomy, and ecology of plants.

In the general courses each student is supplied with a compound microscope and with all the other accessories of a modern well-equipped botanical laboratory.

The laboratory for advanced study is provided with the general equipment for investigational work, and additional facilities are readily available for those who desire to pursue special lines of research.

The department has an excellent herbarium especially complete for Kansas and a botanical library containing the usual standard texts and the principal botanical journals.

COURSES IN BOTANY

FOR UNDERGRADUATES

101. GENERAL BOTANY I. Freshman year, first semester. Class work, one hour; laboratory, six hours.* Three semester credits. Professor Miller, Associate Professor Davis, Assistant Professors Gates and Haymaker, Miss Dalbey, Miss Cashen, and Mr. White.

This is a course of lectures, combined with special study of a required text, with reference reading. The principal life functions of plants, response of plants, such as photosynthesis, digestion, respiration, transpiration, and growth, and the responses of plants to environmental conditions and physical stimuli, are studied. The anatomy of the plant, in so far as it relates to the functions concerned, is studied in some detail. In this course the student gains a general introductory knowledge of the functions and reactions of plants, and learns to regard them from the dynamic standpoint as working organisms. Text: *A Textbook of Botany for Colleges,* by Ganong.

Laboratory.—A series of typical experiments is followed out in the laboratory and in the greenhouse. Each student is furnished with a set of the necessary apparatus, and learns to apply quantitative methods to the study of functions. Laboratory outlines are furnished by the department.

105. GENERAL BOTANY II. Freshman and sophomore years, second semester. Class work, one hour; laboratory, six hours.* Three semester credits. Prerequisite: General Botany I. Associate Professor Davis, Assistant Professors Gates and Haymaker, Miss Dalbey, Miss Cashen, and Mr. White.

A careful study is made of the morphology of the chief great groups of plants, of their physiology and ecology, of the classification and geographic distribution of the plant kingdom, and its economic relation to man. The latter part of the course is devoted to a systematic study of some of the more

* Two of the required laboratory hours are employed in lecture and laboratory quizzes and reviews.

important plant families in which their floral structures are considered. Some time is given to the tracing out of unknown plants by means of a key.

Laboratory.—The aim of the laboratory in this course is to give as thorough a study as may be of the morphology of the chief important groups in the plant kingdom, taken in the order of their relative complexity, and of their probable relations to one another as parts of an evolutionary series. Laboratory outlines are furnished by the department. Text: *A Textbook of Botany for Colleges,* by Ganong.

116. PLANT PATHOLOGY I. Sophomore and junior years, first semester. Class work, one hour; laboratory, six hours.* Three semester credits. Prerequisite: General Botany II. Professor Melchers, Assistant Professor Haymaker, and Mr. White.

The diseases affecting the chief economic crops of field, orchard, and garden are studied in considerable detail. The etiology of the various diseases and their most evident symptoms are considered. The student learns to recognize at sight the principal plant diseases he is likely to encounter on the farm, in the nursery, and in market-garden work. Nonparasitic and bacterial diseases are considered to some extent, but the time is devoted chiefly to the more important diseases caused by the fungi, the life histories of which are studied in some detail. Preventive measures are considered in each case. An extensive collection of preserved pathological material is available.

Laboratory.—Practical work in the recognition of all the more common plant diseases of the farm, orchard, and garden is accompanied by detailed microscopic studies of diseased tissues and identification of the fungous pathogenes which cause them. Complete laboratory outlines, which likewise serve as a text in this course, are furnished by the department.

126. MEDICAL BOTANY. Sophomore year, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: High-school Botany or its equivalent. Assistant Professor Gates.

This is a lecture, laboratory, and reading course dealing with poisonous plants. The lecture includes a study of the principal stock-poisoning plants of the range; losses due to native poisonous plants, methods of identification, habitat, poisonous properties and methods of control and elimination.

Laboratory.—The laboratory work follows the work presented in the lectures, and consists chiefly of a study of the native poisonous plants of the West, and the indentification of these plants by means of a descriptive key.

FOR GRADUATES AND UNDERGRADUATES

202. FRUIT CROP DISEASES. Elective, first semester. Class work, one hour; laboratory, three hours.† Two semester credits. Prerequisite: Plant Pathology I. Assistant Professor Haymaker.

The class work consists of a series of lectures dealing with diseases affecting fruit crops of all kinds. Special emphasis is laid on measures and methods for controlling these diseases by means of spraying, sanitation, and varietal resistance. The preparation and practical application of the standard sprays are considered. Text: *Manual of Fruit Diseases,* by Hesler and Whetzel.

Laboratory.—This consists of a detailed study of each disease affecting the major fruit crops, together with a detailed microscopic study of the organisms causing the disease. The course is especially valuable for those studying horticulture or those expecting to specialize in plant pathology.

203. FIELD CROP AND VEGETABLE DISEASES. Elective, second semester. Class work, one hour; laboratory, three hours.† Two semester credits. Prerequisite: Plant Pathology I. Professor Melchers.

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* Two of the required laboratory hours are employed in lecture and laboratory quizzes and reviews.

† One of the required laboratory hours is employed in lecture and laboratory quizzes and reviews.

This class work consists of a series of lectures dealing with the historical development of phytopathology, with special emphasis on literature pertaining to field-crop and vegetable diseases. The field symptoms are discussed, varietal susceptibility and resistance are considered, and control measures are advised.

Laboratory.—This consists of a detailed microscopic study of the plant diseases attacking field crops and vegetables, and is of value to those who wish to pursue agronomic or horticultural work, and is especially designed for those students who expect to specialize in plant pathology.

204. MYCOLOGY. Elective, first semester. Class work, two hours; laboratory, six hours.* Four semester credits. Prerequisite: Plant Pathology I. Mr. White.

The class work consists of a series of lectures on the classification of fungi, their relationship to one another, and their morphology. Special emphasis is laid on those fungi which cause plant diseases. Some attention is given also to the physiology of fungi, infection, isolation, pure culture methods, etc. This course is designed to train those who wish to become more familiar with the classification of fungi and their morphology and physiology. It is essential for those who wish to follow plant pathological work professionally.

Laboratory.—The laboratory work runs parallel with the class work and consists of a detailed study of the genera of fungi. Considerable outside reading is expected. A reading knowledge of French and German is of help in this connection, but is not required.

208. PLANT PHYSIOLOGY I. Sophomore year and elective, first semester. Class work, three hours. Three semester credits. Prerequisite: General Botany II. Professor Miller.

This course consists of a series of lectures on the more important phases of plant physiology. Such subjects as the root systems of plants, absorption, wilting coefficient, resistance to drought, transpiration, water requirement, photosynthesis, respiration, digestion, and growth are discussed in detail. The subject matter of plant physiology that pertains to agriculture is especially emphasized. The course is designed to give students a broad knowledge of the functions of plants and the more important factors which influence them. The work is supplemented by discussions, reference readings, and special reports.

215. PLANT HISTOLOGY. Elective, second semester. Laboratory, six hours. Two semester credits. Prerequisite: General Botany II. Miss Dalbey.

This course is planned to provide a thorough training in the principles and practice of microtechnical methods in botany, including the killing, fixing, and embedding of plant material, microtome work, and the staining and mounting, by various methods, of a tolerably complete and characteristic series of permanent slides, representing the vegetative and reproductive tissues of typical plants, taken from all the principal groups. Time will be devoted to a careful microscopic study of the slides prepared during the course. Text: Chamberlain's Plant Histology.

220. BOTANICAL SEMINAR. Elective, both semesters. One hour session each week. One semester credit. For prerequisites, consult professor in charge.

The subject matter is outlined at the beginning of each semester and consists of the presentation of investigational work in botany, including the important branches of plant pathology, plant physiology, plant ecology, taxonomy, morphology, and genetics. Fundamental papers along botanical lines are reviewed and a digest is presented. It is expected that graduate students who are taking major or minor work in the Department of Botany will attend these sessions and take part in its programs.

225. TAXONOMIC BOTANY OF THE FLOWERING PLANTS. Elective, first or second semester. Class work, one hour; laboratory, six hours.* Three semester credits. Prerequisite: General Botany II. Assistant Professor Gates.

* Two of the required laboratory hours are employed in lecture and laboratory quizzes and reviews.

The class work consists of a series of lectures dealing with the terms employed, the development of the more important systems of classification, and a consideration of families of plants.

Laboratory.—Selected flower types representing the principal orders and families of plants are studied and plants are identified in the field and in the laboratory.

228. PLANT ECOLOGY. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: General Botany II. Assistant Professor Gates.

The class work consists of a series of lectures dealing with the structure and dynamics of vegetation.

Laboratory.—With the opening of vegetation in the spring, field trips are taken to selected places.

230. PHYSIOLOGICAL PHENOMENA IN THE GERMINATION OF SEEDS. Elective, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: General Botany II. Associate Professor Davis.

This is a course in plant physiology in which the seed is used as the basis of the work in the laboratory. A study is made of the different factors in germination, as to water requirement, temperature, oxygen supply, light, permeability of seed coats by water, solutes, and gases; dormancy, agencies in so-called after-ripening, enzymes, etc. This course is of special interest to students in agronomy, or those who expect to take up work in connection with grain mills, seedhouses, etc.

232. BOTANICAL PROBLEMS. Elective, both semesters. From one to three semester credits. Prerequisites: General Botany II, and approval by the head of the department. Professors Melchers and Miller, Associate Professor Davis, Assistant Professors Haymaker and Gates, Miss Dalbey, Miss Cashen, Mr. White.

In some instances a student may wish to pursue a special field of work which is not listed definitely in one of the undergraduate elective courses. Such a course may be arranged for upon consultation with the instructor.

FOR GRADUATES

301. PLANT PATHOLOGY III. Elective, second semester. Laboratory, nine hours.* Three semester credits. Prerequisite: Mycology. Professor Melchers, Mr. White.

This course is a continuation of Plant Pathology II. Its purpose is to give the advanced student an opportunity for making a closer and more extended study of the pathogenic organisms which cause plant disease. The course includes a somewhat detailed study of the cryptogamic herbarium. Considerable attention is devoted to the growing of pure cultures of pathogenic fungi, the making of inoculations, isolations of fungi, etc. The preparation of media of various kinds for the growing of fungi receives considerable attention. The course is especially designed for those who intend to pursue plant pathology as investigators in experiment stations.

302. PLANT PATHOLOGY IV. Elective, first and second semesters. Laboratory, nine hours.* Three semester credits. Prerequisite: Plant Pathology III. Professor Melchers, Mr. White.

This course involves original research. Problems are chosen by the student along some lines in which he is interested. A carefully worked-out report which summarizes the investigation undertaken, is required at the end of the semester.

308. INVESTIGATIONS IN PLANT TAXONOMY AND PLANT ECOLOGY. Elective, first and second semesters. Laboratory work, including conferences and field

* Two of the required laboratory hours are employed in lecture and laboratory quizzes and reviews.

work, from six to twenty-four hours. From two to eight semester credits. Assistant Professor Gates.

Open to graduate students and especially qualified undergraduates upon approval of application. This course involves original research in a problem, chosen by or assigned to the student. The results are embodied in a written report presented at the end of the course.

310. RESEARCH IN BOTANY. Elective, both semesters. From three to twelve semester credits. Professors Melchers and Miller, Associate Professor Davis, Assistant Professors Haymaker and Gates, Miss Dalbey, Mr. White.

Research problems in the various fields of botany may be outlined. A member of the department staff, acting as major instructor, is in charge. Upon completion of the work it may be submitted in part or as a whole toward a thesis.

Chemistry

Professor KING
Dean WILLARD
Professor SWANSON
Professor HUGHES
Associate Professor NEWMAN
Associate Professor BRUBAKER
Associate Professor COLVER
Assistant Professor TAGUE
Assistant Professor LATSHAW
Instructor WEST
Instructor HARRISS
Instructor KEITH
Instructor BRUNER
Instructor WILKIN
Instructor WATKINS
Instructor SELLERS
Instructor BEATTIE
Associate Food Analyst DE ROSE

All of the industries are becoming more and more dependent for their highest success upon intelligent application of the sciences, and the social sciences are making their greatest progress by tracing their phenomena back to the physical and chemical changes that accompany them. A study of chemistry and physics is therefore essential to any understanding of the processes of nature or of human industry. In the instruction in chemistry the aim is to insist upon a mastery of the chief concepts of the pure science through the agency of textbook drill, accompanied by demonstrations in the lecture room, and experimental observation by the student himself in the laboratory. As the course proceeds, illustrations of chemical principles are drawn from the industrial processes of the chemical, agricultural, domestic, and other arts, thus impressing upon the mind the practical nature of the study. The ultimate object of instruction in this science is to develop in the student the power to form independent judgments upon the manifold problems of daily life in which chemistry plays a part.

The lecture rooms are amply equipped for experiments and demonstrations, and the laboratories are designed to accommodate 936 students each semester in freshman work and qualitative analysis. The laboratories for more advanced work provide space for 324 students, and are well supplied with general and special facilities. The state work in foods, feeding stuffs, and fertilizers, and the chemical investigations of the Experiment Station in soils, crops, animal nutrition, etc., afford unusually good opportunities for students to obtain experience in practical chemistry. In all of the laboratory work the student is required to give the designated amount of time, and at least a certain amount of work must be satisfactorily performed in order to obtain credit.

COURSES IN CHEMISTRY

FOR UNDERGRADUATES

101. CHEMISTRY I. Freshman year, both semesters and summer school. Lectures and recitations, three hours; laboratory, six hours. Five semester credits. Prerequisite: High-school physics. Professor King, Associate Professor Newman, Mr. West, Miss Harriss, Mr. Keith, Miss Bruner, Mr. Wilkin, Mr. Watkins, Mr. Sellers, and Mr. Beattie.

This work begins the study of general chemistry, and is designed, with that of the succeeding semesters, to give the student a knowledge of the fundamental principles of chemistry. As all subsequent progress in this science requires a working knowledge of its principal theoretical conceptions, the principles of nomenclature, the significance of formulas, chemical equations, etc., much attention is given to these, while at the same time the practical uses of the substances, and the processes used in metallurgy, engineering, agriculture, and other arts are emphasized. McPherson and Henderson's *A Course in General Chemistry* is used as a textbook, this semester's work covering the first 331 pages. The text is supplemented by lectures and is amply illustrated by experimental demonstrations.

Laboratory.—As far as time permits, the student performs independently experiments touching the preparation and properties of the more important substances. Preference is given to those operations which illustrate important principles, and the student is required, as far as possible, to study experiments in that light. In this, as in all other laboratory work in chemistry, the objects are to illustrate chemical phenomena, and to teach care in manipulation, attentive observation, logical deduction, and discrimination and accuracy in recording results and conclusions. The student is required to give the designated amount of time, and a minimum amount of work must be satisfactorily performed in order to obtain credit. *Laboratory Exercises in Elementary Chemistry,* by William McPherson, is used as the laboratory guide.

102. CHEMISTRY II. Freshman year, both semesters and summer school. Lectures and recitations, three hours; laboratory, six hours. Five semester credits. Prerequisite: Chemistry I. Teachers same as for Chemistry I.

The work in this course for the first half of the semester is a completion of the study of general chemistry begun the preceding semester. The second half of the semester is devoted to the study of the general principles of qualitative analysis as outlined in an *Elementary Treatise on Qualitative Analysis,* by William McPherson.

Laboratory.—In the laboratory the student studies the ordinary methods of separation and detection of the more common metals, nonmetals, acids, bases, and salts. The teaching of analysis as such is a secondary object, although the student is held to the exact observation and careful reasoning required in ascertaining the composition of single substances and mixtures. The effect of the course is to broaden, strengthen, and unify the student's ideas of general chemistry.

105. CHEMISTRY V-I. Freshman year, both semesters. Lectures and recitations, three hours; laboratory, six hours. Five semester credits. Mr. West.

This course deals with the fundamental laws and theories of chemistry, the elements and their inorganic compounds, and lays emphasis on the application of chemistry to the arts and industries. Both the metals and nonmetals are studied, but the treatment is less detailed than in Chemistry I and II.

Laboratory.—The laboratory work is intended to give the student training in manipulation and first-hand knowledge of the important laws of chemistry and the properties of substances studied, by use of appropriate experiments which the student himself performs.

106. ORGANIC CHEMISTRY (VET.). Freshman year, second semester. Lectures and recitations, three hours; laboratory, six hours. Five semester credits. Prerequisite: Chemistry V-I. Mr. West.

This course is open only to students in the Division of Veterinary Medicine. It includes a brief study of some of the important classes of organic compounds and a more detailed study of one or more representative members of several classes. Some attention is given to the physiological and toxicological effects of certain organic compounds. Text: Witthaus and Scott, *Textbook of Chemistry.*

Laboratory.—In the laboratory the student prepares a few typical organic compounds and studies their physical and chemical properties. The laboratory

directions which are used have been prepared and are supplied by the department.

107 and 108. CHEMISTRY E-I and E-II. Freshman year, first and second semesters, respectively. Lectures and recitations, three hours; laboratory, three hours. Four semester credits each. Prerequisites and teachers same as for Chemistry I and II.

These courses cover the work of general chemistry and qualitative analysis. The relative amount of time spent upon these subjects is the same as in Chemistry I and II with the exception of the laboratory. Instead of spending six hours a week in laboratory, students in these courses spend three hours. Throughout all the work in these courses emphasis is placed upon those phases of chemistry which have a special bearing upon engineering materials. Texts: Same as for Chemistry I and II.

120. ORGANIC CHEMISTRY (AGR.). Sophomore year, both semesters. Lectures and recitations, two hours; laboratory, three hours. Three semester credits. Prerequisite: Chemistry II. Associate Professor Colver and Mr. West.

This course is given for the students in the Division of Agriculture, and includes a careful study of the aliphatic series of hydrocarbons, alcohols, ethers, aldehydes, ketones, organic acids, esters, fats, waxes, carbohydrates, and proteins. Attention is directed to the characteristic properties and relationships of these various classes of compounds and typical members of each group are studied particularly from the standpoint of structure, laboratory preparation and chemical properties as shown by their reactions. Emphasis is placed upon the work bearing upon agricultural pursuits. Text: Norris, *Organic Chemistry,* in part, accompanied by lectures.

Laboratory.—The laboratory work is arranged to parallel the study in the classroom, and includes the preparation of a limited number of organic compounds and a study of their properties and reactions. The experiments include work with fats, carbohydrates, and proteins. The laboratory directions which are used have been prepared and are supplied by the department.

121. ORGANIC CHEMISTRY (HE). Sophomore year, both semesters. Lectures and recitations, three hours; laboratory, six hours. Five semester credits. Prerequisite: Chemistry II. Associate Professor Colver and Mr. West.

This course is for students in the Division of Home Economics and is outlined to give a firm foundation for advanced work in foods and nutrition. A systematic study is made of the more important classes of organic compounds, particularly the aliphatic hydrocarbons, alcohols, ethers, aldehydes, ketones, organic acids, fats, soaps, sugars, starch, and proteins. In addition to a study of aliphatic compounds a brief consideration is also given to several series of aromatic compounds. Especial attention is given to those organic compounds which are used for clothing, fuel, light, antiseptics, disinfectants, anæsthetics, medicine, solvents, in the commercial manufacture of other important products, as well as to many other compounds which contribute to a fuller understanding of the systematic relations existing among all organic compounds. Text: Norris, *Organic Chemistry,* in part, accompanied by lectures.

Laboratory.—In the laboratory the student prepares one or more representative examples of most of the classes of compounds taken up in the classroom. A study is made of their physical properties and their chemical properties as shown by typical reactions. The experiments include work with fats, carbohydrates, and proteins. The laboratory directions which are used have been prepared and are supplied by the department.

150. QUANTITATIVE ANALYSIS I. Sophomore year, both semesters. Laboratory, six hours. Two semester credits. Prerequisites: Chemistry I and II. Associate Professor Brubaker.

This course is planned to give the student a knowledge of the simpler operations in gravimetric analysis and volumetric analysis and to lay the foundation for studies in which such knowledge is required. Particular em-

phasis is laid on the importance of exact quantitative work and its value in investigations connected with agriculture. Textbook: *Notes on Quantitative Chemical Analysis,* by C. W. Folk.

FOR GRADUATES AND UNDERGRADUATES

202. INORGANIC PREPARATIONS. Junior year and elective, both semesters. One semester credit for each three hours of laboratory work. Prerequisite: Chemistry II or Chemistry HE-II. Associate Professor Newman.

Students of Advanced Inorganic Chemistry are advised to take this course. It consists in the preparation and purification of some typical inorganic compound, together with those of more complex composition and compounds of the rarer elements.

203 and 204. INDUSTRIAL CHEMISTRY I AND II. Senior year and elective, first and second semesters, respectively. Offered in 1921-'22 and alternate years thereafter. Class work, three hours; laboratory, six hours. Five semester credits each semester. Prerequisite: Organic Chemistry. Associate Professor Brubaker.

This course treats the more important technical processes. Considerable attention is given to general operations and the machinery employed. The more important commercial manufacturing industries are then taken up, including, with others, the production of alkalies, acids, glass, clay products, cement, paint, pigments, oils, varnish, soap, gas, paper, leather, petroleum, sugars, starch and the products of fermentation and the destructive distillation of wood and coal. Textbook: *Manual of Industrial Chemistry,* by Rogers and Aubert.

Laboratory.—The laboratory work consists of the quantitative analysis of raw materials and industrial products. Laboratory manual: *Quantitative Analysis,* by Edw. G. Mahin.

205. INDUSTRIAL ELECTROCHEMISTRY. Junior year and elective, second semester. Offered in 1922-'23 and alternate years thereafter. Class work, two hours. Two semester credits. Prerequisite: College courses in general chemistry and physics. Associate Professor Brubaker.

In this course are treated briefly the principles of voltameters, electrochemical methods of analysis, electroplating, electrotyping, and the production of metallic objects by electroplating methods. This is followed by fuller treatment of electrolytic refining of metals, the manufacture of various industrial products by electrolytic and electrothermic methods, primary cells, the lead storage battery, the Edison storage battery, the electrometallurgy of iron and steel, and the fixation of atmospheric nitrogen. Textbook: Thompson's *Applied Electrochemistry.*

206. PHYSICAL CHEMISTRY. Junior year, first semester. Lectures and recitations, three hours; laboratory, six hours. Five semester credits. Prerequisite: Organic Chemistry, and Quantitative Analysis; and although not a prerequisite, calculus is recommended. Professor King.

This course is especially adapted to those students desiring a broader knowledge of the more fundamental laws of chemistry. A brief study is made of the modern conception of the atom and radioactive phenomena. A more extensive study is made of the relations found to exist with matter in the gaseous, liquid and solid states. Emphasis is placed upon the following phenomena: Osmosis; solution, including colloids; surface tension; adsorption; equilibria; thermochemistry; ionization; hydrolysis; electromotive force and hydrogen ion concentration.

Laboratory.—The laboratory follows very closely the subject matter of the lectures.

207. ADVANCED INORGANIC CHEMISTRY. Sophomore year and elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Chemistry II or Chemistry HE-II. Associate Professor Newman.

The course consists of a thorough study of the facts of chemistry and their theoretical interpretations according to the views of the present day. Special stress is placed upon the properties of the elements as a basis for methods of classification, and upon the rarer elements and compounds. Students electing this course are advised to take Inorganic Preparations (Chem. 202). Text: *Modern Inorganic Chemistry,* by J. W. Mellor.

208. HISTORY OF CHEMISTRY. Junior year, second semester. Lecture work, one hour. One semester credit. Prerequisite: Physical Chemistry. Dean Willard.

These lectures deal with the history concerning the development of the principal laws and theories of chemistry, special emphasis being placed upon the failures and triumphs of the founders of chemical science.

209. SURFACE TENSION AND RELATED PHENOMENA. Elective and graduate, first or second semester, when requested by a sufficient number. Lectures, two hours. Two semester credits. Prerequisite: Physical Chemistry (Chem. 206). Professor King.

This course of lectures deals with surface tension phenomena. Attention is devoted to methods of measuring surface tension, to surface energetics, and particularly to the relation of surface tension to adsorption, and colloidal formation.

210. CHEMICAL STATICS AND DYNAMICS. Elective and graduate, second semester, when requested by a sufficient number. Lectures and assigned reading, two hours. Two semester credits. Prerequisite: Approved courses in Physical Chemistry and Calculus. Professor King.

This course of lectures deals with the general topics of chemical equilibria, velocity of chemical reactions, hydrolysis, catalysis, etc.

211. PAINT OILS AND PIGMENTS. Elective and graduate, first semester, by appointment. Lectures and assigned readings, two hours. Two semester credits. Prerequisite: Satisfactory courses in Organic Chemistry and Quantitative Analysis. Professor King.

This course consists of a series of lectures and assigned readings on the extraction, purification, and properties of the oils commonly used in paints, on the manufacture and properties of paint pigments, and on a general survey of the products employed as protective coverings for both wood and metal.

212. CHEMICAL THERMODYNAMICS. Elective, second semester, when requested by a sufficient number. Lectures and assigned readings, two hours. Two semester credits. Prerequisites: Approved courses in Physical Chemistry and Calculus. Professor King.

The object of this course is to present those fundamental principles of thermodynamics which are particularly applicable to chemistry. Among the subjects discussed are, the first and second laws of thermodynamics and their applications to fusion, evaporation, phase rule, chemical equilibrium, chemical affinity, electromotive force, surface tension and adsorption.

218. ORGANIC CHEMISTRY I. Sophomore year, first semester. Lectures, two hours; laboratory, six hours. Four semester credits. Prerequisite: Chemistry II. Associate Professor Colver.

This course is for those students who expect to take a second semester of organic chemistry. The aliphatic hydrocarbons, alcohols, ethers, aldehydes, ketones, acids, esters, amides, acylhalides, acid anhydrides, amines, halogen substituted acids, amino acids, hydroxy acids, aldehyde acids, ketone acids, hydroxy aldehydes, hydroxy ketones, and related compounds are considered particularly from the standpoint of structure, methods of laboratory and commercial preparation, reactions, and uses. Special attention is given to such topics as structural, geometrical, and optical isomerism, and the use of acetoacetic ester and malonic ester in organic synthesis. Reference: Perkin and Kipping, *Organic Chemistry.*

Laboratory.—The laboratory work parallels the lectures and includes the preparation, purification, and reactions of one or more typical examples of most of the groups of compounds studied in the classroom. The laboratory directions which are used have been prepared and are supplied by the department.

219. ORGANIC CHEMISTRY II. Sophomore year, second semester. Lectures, two hours; laboratory, six hours. Four semester credits. Prerequisite: Organic Chemistry I. Associate Professor Colver.

This course is a continuation of Organic Chemistry I and takes up in analogous manner the structure, methods of laboratory and commercial preparation, reactions and uses of the aromatic compounds. Particular attention is also given to the orientating influence of various groups, the structure and reactions of the diazonium compounds, and a brief study is made of the different classes of dyes, the alkaloids, the terpenes, and a few heterocyclic compounds.

Laboratory.—In the laboratory the student carries out various preparations that illustrate the reactions which are characteristic of aromatic compounds, such as bromination, sulfonation, nitration, acetylation, diazotization, and replacement and coupling of the diazonium group. A portion of the laboratory work includes the determination of carbon, hydrogen, and nitrogen in pure unknown organic compounds by the combustion method. Laboratory guide: Noyes, *Organic Chemistry for the Laboratory.*

223. ORGANIC PREPARATIONS. Senior year, first semester. Laboratory, three to fifteen hours. One to five semester credits. Prerequisite: Organic Chemistry II. Associate Professor Colver.

The compounds prepared in this course are so chosen as to give the student a thorough knowledge of the fundamental principles of synthetic organic chemistry.

224. QUALITATIVE ORGANIC ANALYSIS. Elective, first semester; given when requested by a sufficient number. Laboratory, six hours. Two semester credits. Prerequisite: Organic Chemistry II. Associate Professor Colver.

This is primarily a laboratory course designed to impress upon the student's mind the characteristic reactions of the various classes of organic compounds. The first few weeks are spent in carrying out class reactions, using known compounds; the remainder of the semester is devoted to the classification and identification of pure, unknown substances and mixtures. Manual: *Class Reactions and Identification of Organic Substances,* by Noyes and Mulliken; reference book, *A Handbook of Organic Analysis,* by H. T. Clarke.

225. STEREOISOMERIC AND TAUTOMERIC COMPOUNDS. For graduate and advanced students in chemistry, second semester; given when requested by a sufficient number. Lectures, two hours. Two semester credits. Prerequisite: Organic Chemistry II. Associate Professor Colver.

The course consists of lectures and assigned readings upon such special topics of organic chemistry as optical isomerism, particularly the older and more recent methods of determining the configuration of the asymmetric carbon atoms of sugars; geometrical isomerism; and ketoenol tautomerism.

226. CARBOCYCLIC AND HETEROCYCLIC COMPOUNDS. For graduate and advanced students in chemistry, second semester; given when requested by a sufficient number. Lectures, two hours. Two semester credits. Prerequisite: Organic Chemistry II. Associate Professor Colver.

The course consists of lectures and assigned readings upon carbocyclic and heterocyclic compounds. In the study of the carbocyclic compounds the structure, orientation, methods of synthesis, and reactions of benzene, napthalene, anthracene, and derivatives are considered in much greater detail than is possible in an elementary course. The heterocyclic compounds studied include furane, pyrrol, thiophene, pyridine, quinoline, isoquinoline, purine, pyrimidine, hydantoin, and some structurally related substances, such as certain classes of dyes, the alkaloids, and uric acid.

230. PRINCIPLES OF ANIMAL NUTRITION. Elective and graduate, second semester. Class work, three hours. Three semester credits. Prerequisite: Organic Chemistry. Professor Hughes.

This course gives a thorough study of the relations of animals to matter and energy, and the physiological principles involved. Study of the researches which have established the principles of nutrition constitutes the ground work of the course.

231. PHYSIOLOGICAL CHEMISTRY. Senior year, elective and graduate, first semester. Lectures and recitations, three hours; laboratory, six hours. Five semester credits. Prerequisite: An acceptable course in organic chemistry. Professor Hughes.

This course is designed to meet the needs of students who expect to specialize in nutrition or in one of the biological sciences. It is a systematic study of the synthetic and analytical chemical changes that accompany the physiological processes of animals and plants. The chemical properties of food and body substances, and their general specific functions; the changes that take place in digestion, assimilation and elimination, and the means by which these are brought about; enzymes and their functions; the blood and lymph; general metabolism, and the interrelations of organs, are among the important topics studied. Text: Mathews' *Physiological Chemistry*.

Laboratory.—The laboratory work is designed to familiarize the student with the compounds and processes discussed in the lectures and recitations. Laboratory guide: Mathews' *Physiological Chemistry*.

232. PHYSIOLOGICAL CHEMISTRY I. Senior year, first semester. Class work, three hours; laboratory, six hours. Five semester credits. Prerequisite: Organic Chemistry. Professor Hughes.

This course is designed to meet the needs of students who expect to specialize in nutrition or one of the biological sciences. It treats of the chemistry of carbohydrates, lipins and proteins, and the chemical changes which these undergo during the processes of digestion and metabolism.

Laboratory.—The laboratory work is designed to familiarize the student with the compounds and processes discussed in the class work.

233. PHYSIOLOGICAL CHEMISTRY II. Senior year, second semester. Class work, three hours; laboratory, six hours. Five semester credits. Prerequisite: Physiological Chemistry I. Professor Hughes.

This is a continuation of Physiological Chemistry I. It includes the chemistry of the body tissues and excretions.

Laboratory.—The laboratory work includes a qualitative and quantitative study of the tissues and excretions discussed in the class work.

234. BIOCHEMICAL PREPARATIONS. Senior year, second semester. Laboratory work, fifteen hours. Five semester credits. Prerequisites: Organic Chemistry II, and Physiological Chemistry I. Professor Hughes.

This course includes the isolation, purification, and analysis of a number of compounds which are of importance in biochemistry and nutrition.

235. PATHOLOGICAL CHEMISTRY. Elective and graduate; given when requested by a sufficient number. Class work, two hours. Two semester credits. Prerequisite: An approved course in physiological chemistry. Professor Hughes.

This course presents the chemical facts pertaining to abnormal nutritional processes. The chemical factors involved in the causation, progress and results of disease are discussed under the following heads: inflammation, degeneration, infection, anemia, tuberculosis, dyspepsia, typhoid fever, jaundice, nephritis, diabetes, gout, rheumatism, intoxication.

236. THE CHEMISTRY OF THE PROTEINS. Elective and graduate; given when requested by a sufficient number. Class work, two hours. Two semester credits. Prerequisite: An approved course in organic chemistry. Assistant Professor Tague.

This course consists of a study of the chemistry of the proteins, particularly as regards their sources, isolation and uses, together with their derivatives and degradation products.

240. ADVANCED QUALITATIVE ANALYSIS. Elective and graduate, first semester; given when requested by a sufficient number. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Chemistry II. Associate Professor Newman.

This course is designed to broaden the student's knowledge of chemistry by a systematic study of the properties of the acid and basic elements and their compounds as shown in a detailed study of systematic analysis. Many of the rarer elements are included. A study of the application of chemical theory to analytical reactions is taken up in considerable detail with the aim of familiarizing the student with the important theories as applied to analytical procedure. Reports are made on assigned reference work.

241. QUANTITATIVE ANALYSIS. Sophomore year, second semester. Class work, one hour; laboratory, twelve hours. Five semester credits. Prerequisite: Chemistry II or its equivalent. Associate Professor Brubaker.

The subject matter considered in this course is practically the same as that given in courses 250 and 251, and is arranged for students taking one of the chemistry curricula.

242. FIRE ASSAYING. Junior year, first semester. Laboratory work, six hours. Two semester credits. Prerequisite: Quantitative Analysis. Associate Professor Brubaker.

In this course the student becomes familiar with the ordinary methods of fire assaying. Some attention is also paid to wet assaying. Fire assays of ores containing metals such as copper, zinc, lead, bismuth, tin, silver, and gold are made.

243. GAS ANALYSIS. Junior year, first semester. Laboratory work, three hours. One semester credit. Prerequisite: Quantitative Analysis. Associate Professor Brubaker.

The work in this course acquaints the student with the use of standard apparatus in the analysis of gases. Analyses of air, flue and furnace, and illuminating gases are made.

245. MICROCHEMICAL METHODS OF ANALYSIS. Elective and graduate, given when requested by a sufficient number. Laboratory, three hours. One semester credit. Prerequisites: Elementary Organic Chemistry, and Quantitative Analysis I. Associate Professor Brubaker.

The microscope is a very useful instrument in chemical analysis. The technical chemist finds it indispensable, and its applications are steadily increasing. The object of this course is to teach the student the various methods of using the microscope in chemical analysis, both qualitative and quantitative, applied to both inorganic substances and to vegetable or animal products.

250. QUANTITATIVE ANALYSIS II. Elective and graduate, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Chemistry II. Associate Professor Brubaker.

This course is the first half of a year's work and covers the general procedure of gravimetric analysis, together with a discussion of chemical theory as applied to quantitative reactions. The work consists of a selected series of gravimetric determinations designed to develop accuracy in a number of operations and to introduce the procedures and principles applicable to the quantitative determination of many other substances. Reports are also made on assigned work for the study of methods of analysis not taken up in class. Textbook: *Quantitative Analysis,* by Edward G. Mahin.

251. QUANTITATIVE ANALYSIS III. Elective and graduate, second semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Quantitative Analysis II. Associate Professor Brubaker.

This course covers the general procedures used in volumetric analysis, in-

cluding the preparation of standard solutions and their use in neutralization reactions, oxidation and reduction reactions and precipitation reactions. Volumetric calculations and the theory and applications of indicators are studied in detail. Textbook: *Quantitative Analysis,* by Edward G. Mahin.

This is a continuation of Quantitative Analysis II, and applies the fundamental principles of quantitative work to the analysis of important industrial products and raw materials, including paints, soaps, oils, bituminous materials, coal, gas, water, iron and steel, and other substances, the choice of the work being determined by the instructor in consultation with the student. The chemical theories underlying the methods used are also considered in some detail. Textbook: *Quantitative Analysis,* by Edward G. Mahin. Other standard works on quantitative analysis are used as references.

252. CHEMISTRY OF SOILS AND FERTILIZERS. Senior year, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Quantitative Analysis I. Professor Swanson.

The class work takes up the chemical composition of soils and fertilizers, and those chemical changes in the soil which are most important in affecting plant growth. Attention is also given to colloids and soluble salts in relation to optimum soil conditions. The course is adapted especially to the needs of students of soils.

Laboratory.—The laboratory work is planned to give the student a knowledge of the most important chemical methods used in the analysis and investigation of soils and fertilizers.

253. CHEMISTRY OF CROPS. Senior year, second semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisites: Organic Chemistry, and Quantitative Analysis I. Professor Swanson.

In the class work a detailed study is made of the chemical composition of substances present in plants and plant products; the most important chemical transformations which take place in plant growth; and enzymes and colloids in relation to plant substances and plant growth.

Laboratory.—The laboratory exercises are planned to give the student a working knowledge of the most important methods used in the analysis and investigation of substances present in plants and plant products.

254. DAIRY CHEMISTRY. Elective and graduate, second semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisites: Organic Chemistry, and Quantitative Analysis I. Professor Swanson.

The class work is centered chiefly upon the following: A detailed study of the chemical compounds present in milk, butter, cheese, and other dairy products; chemical changes affected by conditions of handling dairy products; a review of literature relating to recent investigational work in dairy chemistry.

Laboratory.—The laboratory exercises are designed to give the student a working knowledge of the most important chemical methods used in the analysis and investigation of dairy products.

255. CHEMISTRY OF MEATS. Elective and graduate, second semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Organic Chemistry, and Quantitative Analysis I. Professor Swanson.

The class work includes the following: A detailed study of the chemical compounds present in the edible portions of meat animals; chemical changes effected by different methods of preparing and storing meat products; a review of recent literature relating to investigational work in the chemistry of meat and meat products.

Laboratory.—The laboratory exercises are designed to give the student a working knowledge of the most important chemical methods used in the analysis and investigation of meats and meat products.

256. INSECTICIDES AND FUNGICIDES. Elective and graduate; given when requested by a sufficient number. Lectures and assigned reading, two hours.

Two semester credits. Prerequisite: Satisfactory courses in organic chemistry and quantitative analysis. Assistant Professor Latshaw.

This course consists of a series of lectures and assigned readings on the manufacture of spray materials, the chemistry involved in mixing and the theory of their toxic actions.

257. FOOD ANALYSIS. Junior year, second semester; given when requested by a sufficient number. Laboratory work, nine hours. Three semester credits. Prerequisites: Organic Chemistry, and Quantitative Analysis I. Associate Food Analyst De Rose.

This course includes the quantitative methods employed in the analysis of the various kinds of foodstuffs. It also includes practice in testing for the presence of adulterants, preservatives, and coloring materials.

260. ADVANCED QUANTITATIVE ANALYSIS. Junior year and elective, first semester. One credit for each three hours of laboratory work. Prerequisites: Quantitative Analysis I or Quantitative Analysis II and III. Associate Professor Brubaker.

Under this heading provision is made for the election of any kind of quantitative chemical work not otherwise designated. The various research and state laboratories afford a large opportunity for advanced work.

265. HOUSEHOLD CHEMISTRY. Elective, second semester; given when requested by a sufficient number. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Organic Chemistry. Associate Professor Brubaker.

The lectures cover the chemistry of numerous problems of air, water, soap, laundering, dry cleaning, food and cookery, and textiles. A portion of the lecture time is given to reciting on the subject matter of previous lectures and of the laboratory work. References are given for study.

Laboratory.—The laboratory work consists largely of quantitative exercises dealing with air, water, soap, foods, food accessories, and textiles.

270. CHEMISTRY PROBLEMS. Elective, both semesters and summer school. Individual problems to fulfill the thesis requirements of students in agricultural chemistry, biochemistry, and industrial chemistry curricula are taken up in this course.

275. CHEMISTRY SEMINAR. Once a week, throughout the year, the officers of the department, with the more advanced students and such others as wish to, meet for papers and discussions upon topics representing the progress of chemical science, chiefly as found in the current journals. The preparation of subjects for presentation at these meetings may be made a part of the credit work of advanced students.

FOR GRADUATES

301. CHEMICAL RESEARCH. Excellent opportunities are offered students to undertake research work in chemistry. Such work is being constantly conducted in the laboratories of the department in connection with the Agricultural and Engineering Experiment Stations. The State Food Laboratory and the laboratories for analysis of feeds and fertilizers are also accessible to students desiring research along such lines. Much emphasis is placed upon research in the department, and all graduate students whose training is adequate are encouraged to participate. Students working out their master's thesis in the Department of Chemistry are assigned to this course. Work is offered in the following lines:

Agricultural Chemistry. Professor Swanson.

Analytical Chemistry. Associate Professors Newman and Brubaker, and Assistant Professor Latshaw.

Organic Chemistry. Associate Professor Colver.

Biochemistry. Professor Hughes and Assistant Professor Tague.

General and Physical Chemistry. Professor King.

Economics and Sociology

Professor KAMMEYER
Professor BURR

Vocational training alone does not fully prepare a student for his life work, nor for the acceptable discharge of his duties as a citizen. It is necessary that he should have at least a general knowledge of the economic and social conditions under which he will live and work, in order that he may become a useful member of society. The state needs men and women trained for citizenship. It is the purpose of the Department of Economics and Sociology to plan and direct its work with this need in view.

A department library of well-selected books and pamphlets bearing on economics, sociology, and statistics is at the disposal of the students, and is used for collateral readings, book reviews, and reports.

COURSES IN ECONOMICS

FOR UNDERGRADUATES

101. ECONOMICS. Junior and senior years, both semesters. Class work, three hours. Three semester credits. Professor Kammeyer.

This is a course in the fundamentals of economic science, including a study of man's wealth-getting and wealth-using activities as they manifest themselves in the consumption, production, exchange, and distribution of commodities and services. Budgets, factories and expenses of production, money, banking, wage systems, labor organizations, rent, interest and profits are some of the leading topics for study and class discussion. These phenomena are here studied in conjunction with the laws or social conventions which control or influence them, such as the federal-reserve systems, the farm-loan act, legal restrictions concerning commerce, strikes, child labor, trusts, monopolies, and the like. The application of economic principles to such subjects as taxation, socialism, insurance, etc., is also considered. Supplementary reading of current literature, reference books, the keeping of notes, and periodical written reports are required. A combination of the textbook and lecture methods is followed. Text: Carver's *National Economy*.

106. BUSINESS ORGANIZATION. Senior year and elective, both semesters. Class work, one hour. One semester credit. Prerequisite: Economics. Professor Kammeyer.

Individual proprietorship, partnership and corporation as forms of business organization and management; the advantages and disadvantages of each, and legislative restrictions are studied in this course. The selling plans, advertising methods and systems of credits and collections used by typical manufacturing and distributive industries are made the basis of study and reports. Attention is given also to the origin and operation of markets and exchanges, to cost accounting, and special systems of wage payment. Instruction is by lectures and reports.

111. LABOR PROBLEMS. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Economics. Professor Kammeyer.

The history, organization, functions, and legal status of labor unions in the United States and in the principal countries in Europe are discussed. Statistics and judicial decisions relating to strikes, boycotts, picketing, arbitration, etc., are subjects of study and investigation. The course also includes a study of the various plans that have been proposed and tried for the more equitable distribution of wealth, such as coöperation, profit-sharing, industrial partnership, etc. Instruction is by lectures, assigned readings, and reports. Text: Groat's *Organized Labor in America*.

116. MONEY AND BANKING. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Economics. Professor Kammeyer.

The first half of this course is devoted to a study of the nature, history and functions of money; its place as a factor in man's economic progress, and its importance as such in his business activities as organized to-day; money standards and systems, monometallism, bimetallism, limping standard, paper standard, gold-exchange standard; coinage and coinage laws; instruments of credit, bills of exchange, drafts; clearing houses. The second half of the course takes up the subject of banking. Banking in its historic forms is briefly considered as a preparation for a more detailed study of the federal-reserve system, the federal farm-loan system, and state banks, particularly Kansas state banks. To this is added a study of savings banks, trust companies, building and loan associations and other institutionalized forms of credit. Instruction is by lectures and reports. Text: Holdworth's *Money and Banking*.

121. ECONOMIC GEOGRAPHY. Elective, first semester. Class work, three hours. Three semester credits. Mr. ———.

This is a discussion of the important facts of the economic world and a study of production and trade as they are influenced by geographical conditions. The geography of the more important commercial products of farm, range, forest, mine, factory, and sea; transportation and manufactures; great commercial and manufacturing centers, and types of commercial nations are considered. Stress is given to the natural resources of the United States as factors in the national development. This includes the current movement to conserve natural resources; the improvement and extension of waterways; the control of water power and water supply. Instruction is imparted by lectures, library work, and study of a text. (Not offered in 1921-'22.)

126. BUSINESS MANAGEMENT. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Economics. Professor Kammeyer.

Plant location and structure; the organization and management of industrial forces; distribution of manufactured goods, with especial attention given to the problems involved in relations of manufacturers, middlemen and consumers; the organization of the sales department; sales management and the art of selling; typical advertising campaigns of different classes of producers; costing and its spread to the different elements of production, are subjects studied in this course. Instruction is given by lectures, library work, and reports. Text: Jones's *Administration of Industrial Enterprises*.

131. COST ACCOUNTING. Elective, both semesters. Class work, two hours. Two semester credits. Mr. ———.

Following a review of the principles of accounting, a general survey of the more important principles of cost accounting is made. This course is concerned particularly with the subject of production costs. The student is expected to keep the principles of costing in mind throughout the whole course, to the end that he may be able to adapt these working principles to concrete problems. Attention is given to the calculation and the distribution of overhead costs, and to the organization of cost systems. Practical problems are given for solution and as means of illustrating and applying the principles. Lectures, laboratory work, and study of the text are the methods of instruction. (Not offered in 1921-'22.)

FOR GRADUATES AND UNDERGRADUATES

213. PUBLIC FINANCE. Elective, second semester. Class conference, two hours. Two semester credits. Prerequisite: Economics. Professor Kammeyer. Text: Plehn's *Public Finance*.

This course embraces a study of public revenues and public expenditures; the development of tax systems; proposed reforms; public indebtedness; budgets; and other phenomena of financial administration. Instruction is by assigned readings, lectures, and reports.

225. CURRENT ECONOMIC PROBLEMS. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Economics. Professor Kammeyer or Professor Burr.

This course is intended to supplement Economics, course 101, and to give an opportunity to those who elect it to make a more intensive study of selected economic problems than was possible in that course. The subject matter varies, of course, to harmonize with changing economic conditions. At present the problems of economic insecurity, of population, of railway regulation or ownership, of international trade, of trade-unionism and of taxation are of dominant interest and importance. These, or as many of them as time permits, are made the subject of careful study, classroom discussion and written reports. Materials are gathered from reference books, government publications, magazines and newspapers, and especial effort is made to encourage the student to think independently and to formulate his own judgments. Text: Hamilton's *Current Economic Problems*.

COURSES IN SOCIOLOGY

FOR UNDERGRADUATES

151. SOCIOLOGY. Elective, both semesters. Class work, three hours. Three semester credits. Professor Burr.

A careful study is made of the fundamental principles of social life as related to other scientific principles. Special consideration is given to their practical application to social action and organization. While proper attention is given to social pathology; poverty, its causes and remedies; crime, its causes and prevention; and to remedial legislation and correctional agencies—special emphasis is placed upon normal constructive social evolution. The processes of socialization, social forces, and social control, particularly in their relation to commercial, industrial and professional leadership, receive special stress. The purpose is to give the student sufficient knowledge of the origins, processes, and meanings of social action to lead him to more specialized study if he so elects, or otherwise to enable him to become an intelligent and leading factor in either urban or rural community life. Problems and opportunities are given for original investigation. Assigned library readings and written reports are required. Instruction is by recitation, class discussion, and lectures. Text: Hayes's *Introduction to Sociology*.

156. RURAL SOCIOLOGY. Elective, both semesters. Class work, three hours. Three semester credits. Professor Burr.

The student should, preferably, precede this course by one in sociology. The principles of sociology are applied to rural conditions. A careful review is made of the history of the country-life movement. A special study is made of the social values and problems of the rural community, including the home, the school, the church, societies and organizations, and the relation of the state to general rural welfare. Special emphasis is placed upon the study of the community as such, its normal area, the relationship between city and country, with theories and methods for unifying and socializing the enlarging community. The social effect of new rural economic movements is briefly dealt with. The purpose of the course is to enable the student to qualify for a more specialized study of rural organization, or to become an intelligent and leading factor as a citizen in a rural community. Text: Phelan's *Readings in Rural Sociology*.

FOR GRADUATES AND UNDERGRADUATES

257. SOCIAL PROBLEMS. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Sociology. Professor Burr.

Social activities and social legislation and constructive methods of dealing with present social conditions are studied. In the early part of the course a general study is made of social conditions growing out of immigration, modern industry, city developments, and population movements. Next is taken up a study of charity and reform organization, including special atten-

tion to "case-taking." Such organized activities are studied with reference to both urban and rural problems. Further attention is given to the condition and care of the wards of society: deaf, blind, epileptic, insane, criminal; delinquent, dependent, and defective children; and the laws and institutions seeking to solve the problems involved. The purpose is to give the student a working knowledge of these social problems, and qualify him, if he so wishes, for a position of professional service in social and industrial welfare organization. Instruction is by lectures, text and library work. Opportunity is given for original investigation and practical experience.

261. RURAL LEADERSHIP. Elective, second semester. Class work, one hour. One semester credit. Professor Burr.

This is a lecture course and leadership conference. Entrance is by special permission of instructor. Although exceptions will be made, students applying for admission will ordinarily be expected to have previously studied Sociology and Rural Sociology. Preference in admission will be given to seniors and graduate students who have already, at least tentatively, chosen their life vocations. Attention is given to qualities that make for success or failure in modern community leadership. Some of the subjects dealt with are: opportunities for leadership; the need of a world vision; community consciousness; training the followers; leading by indirection; volitional evolution; coöperative leadership, etc. While the work is considered from the rural viewpoint, the principles and policies dealt with are equally valuable to one intending to enter a position of leadership in urban commercial and industrial life. Liberal use will be made of bulletins and library reference material.

264. RURAL ORGANIZATION. Elective, both semesters. Class work, two hours. Two semester credits. Professor Burr.

An exhaustive study is made of organizations now working in the rural field, and their present status. The work is considered from the standpoint of the development of the rural community as an economic and social unit. The functions of the community are classified, each function carefully analyzed, and a study made of the organizations and projects by means of which the community performs its various functions. The student is encouraged to make a study, on the functional basis, of his own community, or of one where he can get proper access to necessary sources of information. During the semester occasional lectures are presented by such rural leaders as the dean of extension, the state leader of county agents, the director of home economics in extension, the state leader of home demonstration agents, the state supervisor of county health nurses, the secretary of the state farm bureau, and leaders of other modern effective rural organizations and projects. The purpose of the course is to assist advanced students who have fulfilled other educational requirements to qualify further for positions as county agents, home demonstration agents, county welfare officers, extension specialists, county health nurses, and the like. Instruction is by class conferences, library work, bulletin material and lectures. Text: Burr's *Rural Organization.*

Education

Professor HOLTON
Professor WILLIAMS
Professor ANDREWS*
Professor PETERSON
Associate Professor EDWARDS
Assistant Professor DAVIDSON
Doctor HOLTZ

The courses in this department have for their controlling purpose the professional training of teachers. Two types of courses are offered: (1) courses that give the broad, fundamental principles upon which public education is based, and (2) courses that develop technique and skill in school management and the organization of the subject matter of the curriculum. All courses are

* Absent on leave, 1921-'22.

based upon the proposition that education supported by public taxation should function in social and vocational efficiency.

The State Board of Education has set up the following standards for the certification of teachers:

1. Three-year Certificates Renewable for Life.
   a. Complete four years of College work.
   b. At least eighteen hours of the four years' work must be taken in the Department of Education, as follows: (1) Three semester hours in Psychology, three in Educational Administration, and three in Educational Psychology or Educational Sociology. (2) Nine semester hours elected from the Department of Education.
   c. Credit obtained in college courses in the teaching of special subjects will be accepted to the extent of three semester hours to apply on the required credits in Education, provided that these courses are conducted with the approval of the College Department of Education and are offered in the junior or senior year, with preliminary preparation as follows:

      English.—Not less than fifteen semester hours of college credit, following at least three high-school units.

      Foreign Language.—Not less than fifteen semester hours of college credit in the language in which the teachers' course is taken, following at least three high-school units or equivalent in some foreign language or languages.

      Mathematics.—Not less than fifteen semester hours of college credit, following at least two high-school units.

      Physical Science.—Not less than ten semester hours of college credit in the science in which the teachers' course is taken, following at least two high-school units or equivalent in physical science.

      Biological Science.—Not less than ten semester hours of college credit in the science in which the teachers' course is taken, following at least two high-school units or equivalent in biological science.

      History.—Not less than ten semester hours of college credit, following at least two high-school units or equivalent.

      In any of the above, six hours of college credit will be regarded as the equivalent of one high-school unit.
   d. Valid in any elementary school or high school in Kansas.
2. Three-year Certificates Renewable for Three-year Periods.
   a. Complete at least two years of College work, including three semester hours in Psychology, three in Educational Administration, and three in Methods of Teaching or equivalent courses in the Department of Education which may be acceptable to the State Board of Education.
   b. Valid in any elementary school, junior high school or high school offering not more than a two-year course of study.
3. Certificates for Teachers and Supervisors of Public-school Music.
   a. Complete at least two years of College work, including the following:

      (1) Not less than twenty-eight semester hours in technical courses in Music.

      (2) Three semester hours in Psychology, three in Educational Administration, and three in Methods of Teaching.

      (3) Not less than eight semester hours in Methods of Teaching Public-school Music.
   b. Valid for three years and may be renewed for three-year periods.

4. Certificates for Teachers and Supervisors of Physical Education.
   a. Complete at least two years of College work, including the following:
      (1) Not less than twenty-eight semester hours in the Department of Physical Education.
      (2) Three semester hours in Psychology, three in Educational Administration and three in Methods of Teaching.
   b. Valid for three years and may be renewed for three-year periods.
5. Certificates for Teachers and Supervisors of Manual Training.
   a. Complete at least two years of College work, including the following:
      (1) Not less than twenty-eight semester hours in the Department of Shop Practice.
      (2) Three semester hours in Psychology, three in Educational Administration and three in Methods of Teaching.
   b. Valid for three years and may be renewed for three-year periods.
6. Certificates for Teachers of Vocational Agriculture.
   a. Complete four years of College work, including the following:
      (1) Not less than forty-two semester hours in technical agriculture.
      (2) Eighteen semester hours in the Department of Education: viz., three in Psychology, three in Educational Administration, three in Educational Sociology, three in Agricultural Education, three in Special Methods in Agriculture, and three in Supervised Observation and Teaching.
   b. Valid for three years and may be renewed for life.
7. Certificates for Teachers of Vocational Home-making.
   a. Complete four years of College work, including the following:
      (1) Thirty-four semester hours in technical home economics, as required in the curriculum in Home Economics, and six semester hours of electives; viz., three semester hours in Child Welfare, and three semester hours in Practice Work in Household Management.
      (2) Eighteen hours in the Department of Education; viz., three in Psychology, three in Educational Administration, three in Educational Sociology, three in Home Economics Education, three in Special Methods in Home Economics, and three in Supervised Observation and Teaching.
   b. Valid for three years and may be renewed for life.

COURSES IN EDUCATION

FOR UNDERGRADUATES

Psychology A, B, C, and D are parallel courses in introductory phychology. The content in these courses is fundamentally the same, but the emphasis differs according to the preparation and needs of the various groups of students as indicated below.

101. PSYCHOLOGY A. Freshman and sophomore years, second semester. Class work, three hours. Three semester credits. Required for three-year state certificate. Professor Peterson.

This is an introductory course in psychology for teachers. It consists primarily in a study of the nature of the learning process and of the conditions and methods of study which favor the most rapid and effective progress in learning. The distribution and significance of individual differences and other related topics also receive attention.

102. PSYCHOLOGY B. Freshman year, first semester. Class work, three hours. Three semester credits. Required for state teachers' certificate in music. Professor Peterson.

This is an adaptation of course 101 to the special needs of music teachers. Less time is devoted to the study of learning and some attention is given to the analysis of musical ability into its elemental capacities. A study is made of the methods of measurement of some of these capacities.

103. PSYCHOLOGY C. Junior year and elective, first and second semesters. Class work, three hours. Three semester credits. Required for state life certificate. Professor Peterson.

The aim of this course is to give a fair acquaintance with the more fundamental facts and problems of the entire field of psychology and with the methods by which new facts are ascertained and evaluated. Special attention is given to the psychological factors which directly influence personal efficiency.

104. PSYCHOLOGY D. Junior or senior elective, both semesters. Class work, three hours. Three semester credits. Professor Peterson.

This course is essentially similar to course 103, but more attention is given to those phases of individual and applied psychology which bear directly on the practical problems of daily life. Students in agriculture, engineering, and industrial journalism who desire some work in psychology should enroll in this section.

105. EDUCATIONAL ADMINISTRATION A. Elective, first or second semester. Class work, three hours. Three semester credits. Required for state teachers' certificate. Professor Andrews.

This course is a study of the organization of state, city and county school systems, with special emphasis upon rural and vocational schools; the interrelation of the functions of boards of education, superintendents, principals, teachers. Study of the school law of Kansas is an important part of the course.

106. EDUCATIONAL ADMINISTRATION B. Elective, first or second semester. Class work, three hours. Three semester credits. Professor Williams.

This course is similar to 105 in the general principles of educational administration in a democracy, but differs from it in that it gives special emphasis to the administration and supervision of vocational agriculture, homemaking, and trades and industry. Students preparing to teach these subjects should take this course rather than 105.

109. EDUCATIONAL PSYCHOLOGY. Elective, first or second semester. Class work, three hours. Three semester credits. Required for state teachers' certificate. Prerequisite: Psychology. Professor Peterson.

The course deals with those aspects of psychology that have a direct bearing upon educational practices. Attention is paid to the results of experimental investigations in the field. Instruction is by lectures and library work.

111. METHODS OF TEACHING. Elective, first and second semesters. Class work, three hours. Three semester credits. Prerequisite: Psychology. Professor Strickland.

The aim of this course is the development of good classroom technic through detailed study of child experience as related to the larger demands of education. The work includes lectures, library assignments, observation of classroom teaching, and individual reports and discussions.

113. HISTORY OF EDUCATION A. Elective, first or second semester. Class work, three hours. Three semester credits. Professor Andrews.

This course is intended to present the successive relationships that have existed between educational machinery and practices, and the changing political, economic, scientific, cultural and ideal environments from primitive times to the present.

118. EDUCATIONAL SOCIOLOGY A. Elective, first or second semester. Class work, three hours. Three semester credits. Professor Holton.

This course deals with the concrete objectives of education considered as a process of social adjustment; the meaning of education in a democracy; the educative functions of the home, the community, the church and the school;

the school as a special environment; the meaning of labor and leisure; cultural and vocational education; intellectual and practical studies; and physical and social studies.

119. EDUCATIONAL SOCIOLOGY B. Elective, first or second semester. Class work, three hours. Three semester credits. Professor Holton.

This course is similar to course 118 in general principles of education in a democracy, but differs from it in that it deals with the concrete objectives in vocational agriculture, homemaking, and trades and industry. Students preparing to teach these subjects should take this course rather than course 118.

122. HOME ECONOMICS EDUCATION. Elective, first or second semester. Class work, three hours. Three semester credits. Required of all candidates for state teachers' certificates who are preparing to teach home economics. Prerequisite: Foods I and II, Clothing I and II. Associate Professor Edwards.

This course considers problems dealing with the place of home economics in modern secondary education; the aims and the organization of the work in various types of schools; the administration, maintenance, equipment and supervision of departments of home economics. Special attention is paid to Kansas conditions.

126. AGRICULTURAL EDUCATION. Elective, first semester. Class work, three hours. Three semester credits. Required of all candidates for state teachers' certificates who are preparing to teach agriculture. Prerequisite: Educational Administration. Professor Williams or Assistant Professor Davidson.

A comparative study is made of the provisions for agricultural education in Kansas and other states and countries and of the principles underlying such education. The part played in agricultural education by community, county, state and nation is discussed. Types of schools, courses of study, adjustment of school work to community needs, and the equipment and administration of agricultural schools are studied. The aim of the course is to fit the student to plan, teach and administer or supervise agricultural work, especially in high schools.

130. INDUSTRIAL EDUCATION. Elective, first semester. Class work, three hours. Three semester credits. Expected of all candidates for state teachers' certificates who are preparing to teach manual training, shop work, trade courses, and other industrial subjects. Prerequisite: Educational Administration. Professor Williams.

This course is a study of typical secondary schools of industrial education and departments of industrial education in public schools; of the industrial schools of Germany and other foreign systems; of the making of a course of study in industrial education for secondary schools; and of shop equipment and costs.

132. SPECIAL METHODS IN THE TEACHING OF HOME ECONOMICS. Elective, first or second semester. Class work, three hours. Three semester credits. Expected of all candidates for state teachers' certificates who are preparing to teach home economics. Prerequisites: Foods I and II, Clothing I and II, and Psychology. Associate Professor Edwards.

This course applies the principles of sound teaching to the selection and development of the subject matter of home economics in lessons for high-school pupils and to the conduct of laboratory and classroom exercises. It is supposed to accompany course 141.

136. SPECIAL METHODS IN THE TEACHING OF AGRICULTURE. Elective, second semester. Class work, three hours. Three semester credits. Required of all candidates for state teachers' certificates who are preparing to teach agriculture. Prerequisite: Psychology. Professor Williams or Assistant Professor Davidson.

Training in planning lessons, organizing materials, and conducting class and laboratory work in agriculture is the purpose of this course. The work

includes observation, criticism, and reports of class exercises, a study of work done in high schools, and the making and criticism of lesson plans and outlines. Special attention is given to the selection of laboratory materials, the supervision of laboratory exercises, and the adaptation of class and laboratory work to each other.

140. SPECIAL METHODS IN THE TEACHING OF INDUSTRIAL ARTS SUBJECTS. Elective, second semester. Class work, three hours. Three semester credits. Expected of all candidates for the state teachers' certificate who are preparing to teach industrial subjects. Prerequisites: Mechanical Drawing II, Woodworking II, and Educational Psychology. Professor Williams.

The various lines of work included under the head of industrial arts are studied and a series of progressive lessons worked out in each of these lines emphasizing important elements. A study is made of the various materials employed and the methods of utilizing them for the needs of pupils. The arrangement of courses, the outlines and presentation of assignments, the preparation of assignments, the preparation of laboratory material and the conduct of laboratory exercises are taken up. The work includes recitations, class discussions, assigned readings, and written reports.

141. SPECIAL METHODS IN THE TEACHING OF PHYSICS. Elective. Class work, two hours; laboratory, three hours. Three semester credits. Professor Raburn.

(See Department of Physics, course 224.)

142. SPECIAL METHODS IN THE TEACHING OF MATHEMATICS. Elective. Class work, three hours. Three semester credits. Associate Professor Stratton.

(See Department of Mathematics, course 122.)

143. SPECIAL METHODS IN THE TEACHING OF HISTORY. Elective, first or second semester. Class work, two hours. Two semester credits. Professor Iles.

(See Department of History, course 127.)

144. SPECIAL METHODS IN THE TEACHING OF ENGLISH. Elective, second semester and summer school. Class work, three hours. Three semester credits. Professor Davis.

(See Department of English, course 134.)

160. SUPERVISED OBSERVATION AND TEACHING IN HOME ECONOMICS. Elective, first or second semester. Three semester credits. Prerequisites: Foods I and II, Clothing I and II, and Special Methods in the Teaching of Home Economics. Associate Professor Edwards.

Students whose qualifications are accepted for this course will serve as teachers of sewing and cooking in the classes of the junior high school of Manhattan.

161. SUPERVISED OBSERVATION AND TEACHING IN AGRICULTURE. Elective, first or second semester. Three semester credits. Expected of all candidates for state teachers' certificates who are preparing to teach agriculture. Prerequisite: Educational Psychology. Assistant Professor Davidson.

Students expecting to teach take this work as a part of the regular class in the School of Agriculture. The work is supervised by a member of the Department of Education and by the regular class teacher. Both teachers criticise lesson plans and presentation.

162. SUPERVISED OBSERVATION AND TEACHING IN INDUSTRIAL ARTS. Elective, first or second semester. Three semester credits. Expected of all candidates for state teachers' certificates who are preparing to teach industrial arts. Prerequisite: Educational Psychology. Professor ———.

Industrial classes conducted by experienced teachers are visited and careful observations are made in regard to sequence of courses, methods of presentation, interest, class order, and other phases of class work. Reports are presented on this work for discussion. Students are assigned teaching work under careful supervision, results are noted and suggestions are made for individual improvement.

FOR GRADUATES AND UNDERGRADUATES

201. RURAL EDUCATION. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Educational Administration. Professor Holton or Professor Williams.

This course deals with extension education, boys' and girls' club work, the problems of the rural high school, one-room schools, consolidation, social centers, farmer's organization, and all forms of organized community life in the open country, in so far as they bear on the problems of public education. A certain amount of field work is required in connection with the course.

211. MENTAL MEASUREMENTS. Senior year, first semester. Class work, three hours. Three semester credits. Prerequisite: Educational Psychology. Professor Peterson.

The course is designed to give a working knowledge of the fundamental principles of mental measurement and an appreciation of the significance of the measurement movement in education. A careful study is made of standard tests and scales for the measurement of mental capacity and educational achievement, with special reference to their value in the improvement of classroom methods and conditions of learning. Considerable practice is given in the application of standard tests and scales and in the statistical treatment and interpretation of results.

213. ABNORMAL PSYCHOLOGY. Elective, senior year, second semester. Class work, three hours. Three semester credits. Prerequisite: Psychology C or D. Professor Peterson.

This course is devoted mainly to a study of such manifestations of faulty integration of bodily activities and mental functions as are found in hysteria, dreams, hypnotism, trances, multiple personality, etc. Critical attention is also given to certain questionable concepts of abnormal psychology which are rampant in current literature and to prevalent practices in dealing with mental disorders.

215. APPLIED PSYCHOLOGY. Elective, first or second semester. Class work, two hours. Two semester credits. Prerequisite: Psychology. Professor Peterson.

A study is made of the psychological conditions of personal, industrial and business efficiency as determined by observation and experiment in such special fields as advertising, salesmanship, employment, scientific management, etc. Special attention is given to the use of psychological tests in employment, vocational guidance, etc.

216. ADVANCED SYSTEMATIC PSYCHOLOGY. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Psychology and Educational Psychology. Professor Peterson.

The fundamental problems, methods, and interpretations of general psychology are studied critically in this course.

217. EXPERIMENTAL PSYCHOLOGY OF THE HIGHER MENTAL PROCESSES. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Advanced Systematic Psychology. Professor Peterson.

As an introduction to the types of problems encountered and to the basic methods of procedure essential to the analysis of the thought processes, a study is made of a few representative experiments in animal and sensorimotor learning. This is followed by a survey of the experimental literature on the higher mental processes with special attention to the more objective studies of problem-solving methods in the experimental analysis of the thought processes.

220. THE AMERICAN HIGH SCHOOL. Elective, first or second semester. Class work, three hours. Three semester credits. Professor Andrews.

The course considers the history of secondary education in America with reference to its historic background. The history of the secondary curriculum, the social function of the high school, its administration and the place and importance of each subject in the course of study will receive consideration.

221. EXTENSION METHODS AND PROBLEMS. Elective, second semester. Class work, two hours. Two semester credits. Professor Williams and members of the Extension Division.

The origin and development of extension work, its aim and purposes and relation to other general educational activities are briefly reviewed. The organization and administration of extension work under the Smith-Lever law and the part taken by colleges and the Department of Agriculture; types of extension work conducted by bankers, railroads, manufacturers, and other agencies; and future problems of extension work, are studied.

FOR GRADUATES

301 and 302. EDUCATIONAL SEMINAR I AND II. Open to candidates for the master's degree. First and second semester, respectively. Class work, two hours. Four semester credits on completion of both courses. Prerequisites: Psychology, and Educational Administration. Professor Holton and other members of the graduate faculty.

The work consists of lectures, reports, and class discussions. Each member of the seminar chooses a topic early in the term for special investigation. Preliminary reports are made to the class from time to time and the final results of the study are embodied in a carefully prepared report.

303. EDUCATIONAL SOCIOLOGY C. Open to candidates for the master's degree. Both semesters and summer session. Class work, three hours. Three semester credits. Professor Holton.

This course has for its purpose the discovery of the fundamental social objectives for the curricula in high schools and colleges.

306. EDUCATIONAL ADMINISTRATION C. Class work, three hours. Three semester credits. Associate Professor Andrews.

The subjects considered are: The financial basis of public education, formation of budgets, structure and administration of the curriculum, administration of vocational training, essentials of the elementary curriculum, use of standard tests and interpretation of data. The problems of supervision as they relate to promotion, retardation and failure are considered.

307. HISTORY OF EDUCATION B. Class work, three hours. Three semester credits. Associate Professor Andrews.

The purpose of the course is to show the intellectual background of history, to sketch rapidly the ethical and educational ideas of the ancient world, the Hellenization of the orient, the rise of Christianity and the development of the Renaissance. Political and social history is considered only to interpret the educational plan and purpose of the period. Finally, we consider the modern scientific spirit and the modern educational theories, purposes and ideals.

325. RESEARCH IN EDUCATION. Required of all candidates for the degree of Master of Science whose major work is in the Department of Education. First and second semesters. Hours of work and credit arranged in conference with the head of the department.

The problem selected for research and investigation must be approved by the Graduate Council.

COURSES IN RELIGIOUS EDUCATION

The purpose of courses in religious education is twofold: first, to train students in the method of establishing social control through the implanting of ideals in childhood, and nurturing them carefully through youth, in order to develop a generation of those who would live under the guidance and propulsion of religious and moral ideals, and thus achieve the highest social usefulness; and second, to serve as a basis for preministerial or prereligious vocational training.

The following courses, while acceptable for elective credit in College curricula, will not be accepted by the State Board of Education as professional subjects in education required for a state teacher's certificate:

180. RELIGIOUS EDUCATION A. Elective, first semester. Class work, two hours. Two semester credits. Doctor Holtz.

This course comprises a study of the origin of the Bible; the Bible as a social inheritance; the Old Testament history with special emphasis upon the social message of the prophets; the New Testament with attention given to the social teachings of Christ.

182. RELIGIOUS EDUCATION B. Elective, second semester. Class work, two hours. Two semester credits. Doctor Holtz.

The fundamental instincts, the physiological and psychological characteristics of the various stages of development, and the best methods of moral and religious instruction suited to these stages are studied in this course.

184. RELIGIOUS EDUCATION C. Junior or senior, elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Psychology. Doctor Holtz.

A study is made of the recognized principles underlying modern religious education; the organization of Sunday schools, the subject matter best adapted to each department of the organization; and the application of modern methods of teaching. Given 1921-'22 and alternate years thereafter.

English

Professor DAVIS
Professor CONOVER
Professor ROCKEY
Associate Professor RICE
Associate Professor MATTHEWS
Associate Professor ROSSON
Assistant Professor HEIZER
Assistant Professor RUSSEL*
Assistant Professor STURMER
Assistant Professor ELCOCK
Instructor BOWER
Instructor GARVEY
Instructor RUSHFELDT
Instructor ABERLE
Instructor BOGUE

Ability to think well and to speak well and capacity to appreciate the world's best literature are recognized essentials of a liberal education. The work of the Department of English is to acquaint the student with the best standards of English practice and appreciation and to encourage him to maintain these standards in all his work. To this end the department offers studies in cultural and technical English and special drills in expressing thought freely and effectively in matters touching the vital interests of the student. The study of the English language and literature is thus made the means of increasing his power and efficiency.

COURSES IN ENGLISH LANGUAGE

FOR UNDERGRADUATES

101. COLLEGE RHETORIC I. Freshman and sophomore years, both semesters and summer school. Class work, three hours. Three semester credits. Prerequisite: Three units of high-school English. Professors Davis, Conover, and Rockey, Associate Professors Rice, Matthews, and Rosson, Assistant Professors Heizer, Russel, Sturmer, and Elcock, Miss Bower, Miss Garvey, Miss Rushfeldt, Miss Aberle.

After a series of tests to determine the fitness of the student to pursue the work of the course, a rapid, thorough review of the essentials of English is given, special attention being paid to sentence and paragraph structure. This is followed by themes designed to develop the student's ability to tell accurately what he knows, to describe interestingly what he sees, and, above all, to relate the subject of English to his immediate and future language needs. Texts: MacCracken and Sandison, *Manual of Good English;* Cunliffe and Lomer, *Writing of To-day,* first half.

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* Absent on leave, 1921-'22 and 1922-'23.

104. College Rhetoric II. Freshman year, both semesters. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric I. Professors Davis, Conover, and Rockey, Associate Professors Rice, Matthews, and Rosson, Assistant Professors Heizer, Russel, Sturmer, and Elcock, Miss Bower, Miss Garvey, Miss Rushfeldt, Miss Aberle.

This work is a continuation of the work in College Rhetoric I. Special emphasis is laid on outlining and on expository and argumentative writing. Attention is directed to practical as well as to literary subjects for the frequent themes written throughout the course. Texts: Canby and others, *English Composition in Theory and Practice;* Cunliffe and Lomer, *Writing of To-day,* second half.

105. College Rhetoric II.—Special Practice. Freshman year, both semesters. Class work, three two-hour practice periods. Three semester credits. Prerequisite: College Rhetoric I. Professor Davis, Associate Professor Matthews.

This course parallels the regular College Rhetoric II course, and is arranged to accommodate those students that show a special aptitude for writing and that expect to make writing in some form their profession. Admission to the course is by special permission only.

107. Special English. Freshman year, both semesters. Classes formed when need arises. Class work, three hours. No credit. Professor Conover and Associate Professor Rice.

This course is a review of the essentials of English composition, accompanied by drills in sentence structure and in idiomatic expression, by special exercises and by consultations. It is required of any student assigned to College Rhetoric I who within the first few weeks of the work of that course shows that he is unable to express his ideas clearly and accurately. Textbook: MacCracken and Sandison, *Manual of Good English.*

110. Engineering English. Senior year, second semester; not open to freshmen and sophomores. Class work, two hours. Two semester credits. Prerequisite: College Rhetoric II. Professor Rockey and Associate Professor Matthews.

This is an advanced course in English particularly adapted to the needs of engineers. The general problems of engineering writing are discussed. Specific assignments are made in the writing of business letters relating to engineering and in the preparation of technical manuscripts and reports. Essays of especial value to the engineer are read and analyzed. Texts: Sypherd, *Handbook of English for Engineers;* Aydelotte, *English and Engineering.*

113. Advanced Composition I. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: College Rhetoric II. Professor Conover.

In this course special emphasis is given to the subject of exposition. The subjects of the themes required are taken as far as possible from the student's particular field of work. Models of reports, explanations and general expository work are carefully studied. Text: Curl, *Expository Writing.*

116. Advanced Composition II. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Advanced Composition I. Professor Davis, Professor Conover.

Narrative writing is studied in this course, both in its relation to the other forms of composition and as an independent form. The practical forms of narrative are studied in detail, and attention is given to the short story. Text: Buck and Morris, *Narrative Writing.*

119. Argumentation and Debate. Elective, both semesters. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric II. Associate Professor Rosson.

This course includes a systematic study of the theory of debate; brief making; classroom practice in debating, in defending propositions, and in

extemporaneous speaking; the proper method of collecting and classifying material; and effective methods of refuting arguments. Consultations, library investigations, and special group conferences form helpful laboratory features of the course. Text: Stone and Garrison, *Essentials of Argument.*

122. COMMERCIAL CORRESPONDENCE. Elective, first semester and summer school. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric II. Professor Davis and Associate Professor Matthews.

This course comprises a thorough review of the routine types of business correspondence and a study of the writing of adjustment, credit, collection, and sales letters. A close study is made of the principles of effective writing as they are found applied in the best writing in the commercial world. Text: Gardner, *Effective Business Letters.*

123. WRITTEN AND ORAL SALESMANSHIP. Elective, second semester. Class work, three hours. Prerequisite: College Rhetoric II. Professor Davis and Associate Professor Matthews.

This course continues the work of Commercial Correspondence. Special attention is paid to the writing of follow-up systems of sales letters and to the composition and display of circular material and catalogues. The basic principles of advertising and the psychology of selling are emphasized. Special practice is given in the various forms of sales talks, and actual sales practice with commercial concerns is arranged for.

128. ORAL ENGLISH I. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric I. Professor Rockey and Assistant Professor Heizer.

In this course a study of the principles of oral composition and practice in oral composition in the form of explanations, narrations, descriptions, selling and other business talks, travel talks, and speeches for special occasions are offered. For materials for the class exercises students are directed to cultural subjects, more particularly to painting, sculpture, architecture, and music. Text: Brewer, *Oral Composition.*

131. ORAL ENGLISH II. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric I. Professor Rockey and Assistant Professor Heizer.

This course is a continuation of Oral English I, but does not require it as a prerequisite. Attention is directed especially to the forms of oral English more commonly employed, such as conversation, the toast or after-dinner speech, introductions, nominations, announcements, presentations, and the like. For reading the students are directed to current magazines so as to be able to discuss current events of all kinds. Text: Brewer, *Oral Composition.*

134. METHODS OF TEACHING ENGLISH. Elective, second semester and summer school. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric II. Professor Davis and Associate Professor Rice.

This course is planned to meet the needs of those who are called upon to teach English in connection with the applied sciences. The course of study, the application of English instruction to life needs, and definite methods of motivating English instruction are especially considered.

137. AGRICULTURAL ENGLISH. Senior year, first semester. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric II. Professors Davis and Conover, Associate Professor Matthews.

This course consists of a rapid review of the essentials of English composition as applied in the business writing of the modern farmer. Business correspondence, bulletin writing, the organization of short business talks, and the basic principles of farm advertising are considered. The problems of writing that confront the county agent, the high-school teacher of agriculture, and the farm manager are made the subject of discussion and practice.

FOR GRADUATES AND UNDERGRADUATES

201. FARM ADVERTISING. Elective, first semester. Class work and practice, three hours. Three semester credits. Prerequisite: College Rhetoric II. Professor Davis.

How to advertise all kinds of farm produce in order to secure regular customers by parcel post or by direct delivery is the object of this course. The student is shown how to write the most effective copy for display advertising and handbills, and how to feature the central point in each advertisement. The course includes the collection of the most important facts concerning farm produce and such study of markets and marketing as is necessary. Classes in this course are organized upon request of the Division of Agriculture.

204. FARM BULLETINS. Elective, second semester. Work arranged by appointment. Two semester credits. Prerequisite: College Rhetoric II. Professor Davis and Associate Professor Matthews.

In this course the student is required to make an extensive study of farm bulletins and the essentials of writing good bulletins. How to write in a simple, direct style that appeals to the readers for whom the bulletin is intended is the subject of careful study. Current farm bulletins are made the basis for the work. The course is designed especially for those who intend later to write farm bulletins.

207. TECHNICAL WRITING. Elective, first semester. Work arranged by appointment. Two semester credits. Prerequisite: One of the following courses: 113, 116, 122, 125, 201, 204. Professors Davis and Conover.

This course is planned to help students properly to record and to report technical work. Fundamental principles of technical writing are studied in connection with such practice as will necessitate clearness, accuracy, and effectiveness. Text: Watt, *The Composition of Technical Papers.*

251. THE SHORT STORY I. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: English Literature I. Associate Professor Rice.

This course comprises a study of the world's best short stories and gives practice in writing sketches and short stories. The elements of the story—plot, setting, action, and characterization—are especially emphasized. Texts: Esenwein, *Writing the Short Story;* Dawson, *Great English Short Stories* (2 vols.).

252. THE SHORT STORY II. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Short Story I. Associate Professor Rice.

This course is a continuation of Short Story I. Special stress is laid upon the preparation of the short story for publication. A study of the short story in America is made, giving special attention to types, characteristics, and tendencies. A special study of the standards set by leading magazines is a feature of the work, and market problems are considered.

FOR GRADUATES

Classes in courses listed under the graduate group are organized whenever the demand for them is sufficient. When the demand does not justify the organization of a class the work may be arranged for by appointment. Special arrangements for work should be made with the head of the department.

301. HISTORY OF THE ENGLISH LANGUAGE I. Elective, first semester. Class conference, two hours. Two semester credits. Prerequisite: English Literature II. Professor Conover.

This course offers a study of the origin and development of the English language. Special emphasis is placed on Old English. Texts: Wyld's *Historical Study of the Mother Tongue* and Bright's *Anglo-Saxon Reader.*

302. HISTORY OF THE ENGLISH LANGUAGE II. Elective, second semester. Class conference, two hours. Two semester credits. Prerequisite: English Literature II. Professor Conover.

This course is a continuation of History of the English Language I. Special emphasis is placed on Middle English and Modern English. Texts: Wyld's *Historical Study of the Mother Tongue* and Emerson's *Middle English Reader.*

304. RESEARCH IN APPLIED ENGLISH. Elective, second semester. Class conference, two hours. Two semester credits. Prerequisite: English Literature II. Professor Davis.

Individual assignments are made in the fundamental fields of research in applied English. The student is required to carry on an original investigation and to make an acceptable report of his research work.

COURSES IN ENGLISH LITERATURE

FOR UNDERGRADUATES

171. ENGLISH LITERATURE I. Sophomore year, both semesters and summer school. Class work, four hours. Four semester credits. Prerequisite: College Rhetoric II. Professors Davis, Conover, and Rockey, Associate Professors Rice, Matthews and Rosson, Assistant Professors Heizer, Russel, Sturmer, and Elcock, Miss Bower, Miss Garvey, Miss Rushfeldt.

In this course the students are made familiar with the principles of literary appreciation and are taught to apply them to selected texts in narrative, lyric, and dramatic poetry, as well as in fiction, the essay, and the oration. The work of the course is intensive; notebooks are kept and frequent tests are given. Texts: Heydrick, *How to Study Literature;* and Cunliffe, Pyre, and Young, *Century Readings in English Literature.*

174. ENGLISH LITERATURE II. Sophomore year, both semesters and summer school. Class work, four hours. Four semester credits. Prerequisite: English Literature I. Professors Davis, Conover, Rockey, Associate Professors Rice, Matthews, and Rosson, Assistant Professors Heizer, Russel, Sturmer, and Elcock, Miss Bower, Miss Garvey.

This course presents the history of English literature by means of lectures and discussions of the text. Extensive assignments in reading are made, and reports are given in class. Weekly tests are required. Texts: Long, *English Literature;* and Cunliffe, Pyre, and Young, *Century Readings in English Literature.*

177. ENGLISH LITERATURE HE-I. Sophomore year, both semesters. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric II. Professor Davis, Associate Professor Rice, Assistant Professors Heizer, Russel, Sturmer, and Elcock, Miss Bower.

This course offers in slightly condensed form the work given in course 171. Texts: Heydrick, *How to Study Literature;* and Cunliffe, Pyre, and Young, *Century Reading in English Literature.*

180. ENGLISH LITERATURE HE-II. Sophomore year, both semesters. Class work, three hours. Three semester credits. Prerequisite: English Literature HE-I. Professors Davis, Conover, Assistant Professors Heizer, Russel, Sturmer, Elcock, Miss Bower.

This course presents a history of English literature in much the same way as course 174. The amount of reading required is less. Text: Long, *English Literature;* and Cunliffe, Pyre, and Young, *Century Readings in English Literature.*

FOR GRADUATES AND UNDERGRADUATES

271. THE ENGLISH BIBLE I. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: English Literature I. Professor Conover.

This course has for its basis the purpose of familiarizing the student with the development of the English Bible as a whole. The narratives of the Old

and New Testaments are read and a careful study is made of the literary style of the Bible in order to emphasize its simplicity, clearness, and power. Text: Moore, *The Literature of the Old Testament.*

272. THE ENGLISH BIBLE II. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: English Literature I. Professor Conover.

In this course the different kinds of literature found in the English Bible are studied. Especial attention is paid to the poetry of the Bible and to the wisdom literature and the book of Job. This course, while being a continuation of The English Bible I, is in itself an independent unit and does not require The English Bible I as a prerequisite. Text: Penniman, *A Book about the English Bible.*

273. SHAKESPEAREAN DRAMA I. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: English Literature I. Professor Davis and Assistant Professor Sturmer.

This course aims to make the students familiar with the life and times of Shakespeare and his dramatic art as shown in five of his tragedies—King Lear, Macbeth, Hamlet, Coriolanus, and Romeo and Juliet. Text: *Shakespeare's Principal Plays,* by Brooke, Cunliffe, and MacCracken.

274. SHAKESPEAREAN DRAMA II. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: English Literature I. Professor Davis and Assistant Professor Sturmer.

This course includes collateral reading in Shakespeare and his contemporaries and in intensive study of five of Shakespeare's comedies—The Winter's Tale, Cymbeline, As You Like It, Twelfth Night, and The Tempest. Text: *Shakespeare's Principal Plays,* by Brooks, Cunliffe, and MacCracken.

The work given in Shakespearean Drama I is not a prerequisite for the work in Shakespearean Drama II.

275. EIGHTEENTH CENTURY LITERATURE. Elective, first semester. Alternate years beginning 1923-'24. Class work, three hours. Three semester credits. Prerequisite: English Literature II. Professors Davis and Conover.

This course includes a study and discussion of the leading literary movements of the eighteenth century. Important representative works are read and are made the subject of class reports and discussions.

277. NINETEENTH CENTURY LITERATURE. Elective, first semester. Alternate years beginning 1922-'23. Class work, three hours. Three semester credits. Prerequisite: English Literature II. Professors Davis and Conover.

In this course there is discussion of the literary movements found throughout the century, especially in the Victorian period. Significant works are read and are made the subjects of class reports and discussions. Text: Saintsbury, *Nineteenth Century Literature.*

280. AMERICAN LITERATURE. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: English Literature I. Professor Davis and Associate Professor Rice.

This course consists of lectures on the history of American literature and of class reports on assigned readings. A special study is made of the standard works of the chief American authors. Text: Curtis Hidden Page, *Chief American Poets,* and Pattee, *History of American Literature.*

282. CURRENT LITERATURE. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisites: English Literature I and II. Professor Conover.

This course in contemporary literature consists of a study of the novel since Hardy, the development of the drama since Ibsen, and of modern poetry, especially in its newer forms. Representative novels, plays and poems are read, reported upon and discussed. Attention is also given to the influence of the critic in recent literature.

286. THE NOVEL I. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: English Literature II. Professor Conover, and Assistant Professors Russel and Elcock.

This course comprises a study of the English novel, including the discussion of its historical development, its relation to other forms of fiction, and its place in contemporary literature. Especial attention is given to representative works of modern writers, both English and American. Text: Cross, *The Development of the English Novel.*

287. THE NOVEL II. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: English Literature II. Professor Conover and Assistant Professors Russel and Elcock.

This course is a continuation of The Novel I. A review of the essentials in the study of the novel is given, and readings of representative modern novels are continued, with definite class reports.

288. ENGLISH SURVEY I. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: Nineteenth Century Literature, or its equivalent. Professors Davis and Conover.

This course offers an advanced study in the history of English literature. Beginning with Anglo-Saxon times, the course continues through the Middle English period down to the close of the Elizabethan period. Basic text: *The Cambridge History of English Literature.*

290. ENGLISH SURVEY II. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: English Survey I. Professors Davis and Conover.

This course is a continuation of English Survey I. It traces the rise of Puritanism and its influences on English literature. Emphasis is placed upon the classical movement. A brief survey is made of romanticism and its development. Basic text: *The Cambridge History of English Literature.*

291. WHITMAN AND DEMOCRACY. Elective, second semester. Alternate years beginning 1922-'23. Class work, three hours. Three semester credits. Prerequisite: English Literature II. Professors Davis and Conover.

This course offers a study and interpretation of the most important works of Walt Whitman. Especial attention is given to the consideration of his vision of the democracy exemplified in American institutions.

292. BROWNING. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: English Literature I. Professor Davis and Assistant Professor Sturmer.

This course offers a study in the interpretation of the most important poetic and dramatic works of Robert Browning. Texts: Browning's *Complete Poetical Works,* and Phelps' *Browning, How to Know Him.*

294. TENNYSON. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: English Literature I. Professors Davis and Rockey.

This course offers a study in the interpretation of the most important poetic works of Alfred Tennyson. Texts: Tennyson's *Complete Poetical Works,* and Van Dyke's *The Poetry of Tennyson.*

295. THE ARTS AND CRAFTS MOVEMENT. Elective, second semester. Alternate years beginning 1923-'24. Class work, two hours. Two semester credits. Prerequisite: Nineteenth Century Literature, or its equivalent. Professor Conover.

This course takes as its basis the life of William Morris, and treats of the arts and crafts movement in its relation to literature. Works of Morris, Rossetti, Ruskin, and other writers of the same group are read and discussed. Text: Mackail's *Life of William Morris.*

296. THE NEW POETRY. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Literature II. Professors Crawford and Conover.

This course comprises a brief study of the new poetry movement and includes a reading and study of the leading poetic creations and representative writers of new poetry. The course also includes some practice in the writing of poetry.

FOR GRADUATES

Classes in courses listed under the graduate group are organized whenever the demand for them is sufficient. When the demand does not justify the organization of a class the work may be arranged for by appointment. Special arrangements for work should be made with the head of the department.

310. THE ROMANTIC MOVEMENT I. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: Nineteenth Century Literature. Professors Conover and Rockey.

This course offers advanced work in the study of eighteenth century romanticism. Text: Beers, *A History of English Romanticism in the Eighteenth Century.*

313. THE ROMANTIC MOVEMENT II. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Nineteenth Century Literature. Professors Conover and Rockey.

This course continues throughout the Victorian period the work of the preceding course. Text: Beers, *A History of English Romanticism in the Nineteenth Century.*

315. RESEARCH IN THE LITERATURE OF INDUSTRY. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: Nineteenth Century Literature. Professors Davis and Conover.

This is an investigation and research course based upon a careful study of the development of the distinctive literature of industry.

Entomology

Professor DEAN
Associate Professor MERRILL
Associate Professor SMITH
Associate Professor MCCOLLOCH
Assistant Professor HAYES

In all courses a special effort is made to make the student realize that he is studying living things which form a part of his daily environment, and upon which his welfare in many cases vitally depends. In courses in which both class and laboratory instruction is given, the closest correlation is striven for, and wherever possible the same form is studied simultaneously in laboratory and class. The student is led to integrate his classroom knowledge with local animal life by means of frequent and carefully planned field excursions and by the free use of vivaria in laboratory and museum. The courses offered are intended to awaken in the student a keen appreciation of the general principles underlying insect life, of the life economy of the more beneficial as well as the more injurious species, and of the general principles governing methods for their control.

Standard anatomical charts, a representative collection (especially of local species), a high-grade lantern for the projection of lantern and microscope slides, a large and excellent series of lantern slides (many of them colored), and a series of microscope slides are available for illustration. Compound and dissecting microscopes sufficient for the needs of laboratory classes have been provided.

Facilities for advanced work are provided for graduate students and others who expect to pursue the subject professionally. An advanced laboratory is equipped with individual desks, binocular microscopes, compound microscopes, rotary microtome, imbedding ovens, drawing apparatus, and a supply of glassware and reagents sufficient for histological work and for research. A well-equipped insectary is available for training in insectary methods. An air-conditioning machine in the insectary adds materially to the possibilities for experimental work. A field station with all the necessary equipment provides means for the study of insects under normal field conditions.

COURSES IN ENTOMOLOGY

FOR UNDERGRADUATES

101. GENERAL ENTOMOLOGY. Junior and senior years and elective, both semesters and summer school. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: General Zoölogy I and II. Professor Dean, Associate Professor Smith.

This is a study of the elementary anatomy and physiology of insects, complete enough to give a thorough understanding of the life history and habits of the most important species and the general principles upon which the control of these economic forms is based. It is a study of the more important general facts about insects as a class; the main characters of the different orders and groups; how they survive and multiply; and how the structure and habits of one group render it susceptible to certain measures of control, while in other groups entirely different measures are necessary. The class work consists of lectures and of text and special reference study.

106. HOUSEHOLD ENTOMOLOGY. Elective, first semester. Class work, two hours. Two semester credits. Prerequisites: General Zoölogy I and II. Professor Dean.

This is a study of the elementary structure and physiology of insects, complete enough to give a clear understanding of the life history, habits, and methods of control of the principal insects injurious to house, garden, lawn, and human health. The course consists of reference study and a series of lectures.

111. APICULTURE. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: General Entomology. Associate Professor Merrill.

This course comprises a general study of the structure, life history, general behavior, activities, and products of the honeybee. Special attention is given to practical beekeeping, the best methods used among beekeepers being discussed. A study is made of bee diseases and of the standard methods to be used in their eradication and control. A study is also made of the relation of bees to agriculture and horticulture.

116. MILLING ENTOMOLOGY. Junior year, first semester. Class work, one hour. One semester credit. Professor Dean.

This is a study of the insect pests of flour mills, elevators, granaries, warehouses, and bakeries, and of the standard methods to be used in dealing with them. The course consists of lectures and special reference reading. Inspection trips are made to flour mills and warehouses.

FOR GRADUATES AND UNDERGRADUATES

201. HORTICULTURAL ENTOMOLOGY. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: General Entomology. Associate Professor Merrill.

This is a study of the most important insect pests of orchard, garden and forest, and of standard methods for controlling their ravages. The class work consists of lectures and the study of references.

206. GENERAL ECONOMIC ENTOMOLOGY. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: General Entomology. Professor Dean.

This is a study of the life economy of the more important economic insects, of methods to be used in dealing with them, and of the literature of economic entomology. The student is made familiar with our present knowledge of the most important of our injurious insects, with the sources of economic literature, and with methods commonly used in the investigation of problems in economic entomology. The class work consists of lectures, and of text and special reference reading.

Laboratory.—The laboratory work consists of the formation and study of a collection of injurious insects, and in insect breeding. This work naturally in-

volves much field study, in the course of which the student gains a first-hand acquaintance with the more important injurious insects at home in nature.

211. INSECT MORPHOLOGY I. Elective, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: General Entomology. Assistant Professor Hayes.

This course deals exclusively with the external anatomy of representative insects belonging to a number of orders. The types studied are selected so as to present the essentials of the structure of the exoskeleton and to afford a basis for the courses in taxonomy and for professional studies in hexapod morphology.

212. INSECT MORPHOLOGY II. Elective, first semester. Laboratory, nine hours. Three semester credits. Prerequisite: Insect Morphology I. Assistant Professor Hayes.

This course is designed for those advanced students who desire more thorough preparation in the essentials of insect anatomy than is provided for in Insect Morphology I. More extensive studies of detailed external and internal anatomy are made and preparation is afforded for advanced work in taxonomy and research in morphology.

216. PRINCIPLES OF TAXONOMY. Elective, second semester. Lectures, one hour. One semester credit. Prerequisites: (1) For students taking Taxonomy of Insects I: General Entomology and Insect Morphology I. (2) For students taking Taxonomy of Vertebrates: General Zoölogy I and II. All students registering in Taxonomy of Insects I must also register for this course. Courses cannot be taken separately. Assistant Professor Hayes.

This course of lectures deals with the fundamental principles of modern taxonomy. The following subjects are considered in detail: Systems of classification; terminology of taxonomic groups; criteria of species and genera, binomial nomenclature, pre-Linnæan and modern nomenclature; international code of zoölogical nomenclature, and other codes; law of priority; and modern tendencies in taxonomy.

217. TAXONOMY OF INSECTS I. Elective, second semester. Laboratory, six hours. Two semester credits. Prerequisites: General Entomology and Insect Morphology I. Students registering for this course must also register for the course in Principles of Taxonomy. Assistant Professor Hayes.

This is a study of the general principles of the classification of representative insects. The purpose of the course is so to familiarize the student with the literature, methods and ideals of classification that he will be able to identify unknown forms and to pursue advanced taxonomic studies.

218. TAXONOMY OF INSECTS II. Elective, second semester. Laboratory, nine hours. Three semester credits. Prerequisite: Taxonomy of Insects I and Insect Morphology II. Assistant Professor Hayes.

This course provides for a more comprehensive preparation in the field of insect taxonomy. At the discretion of the instructor, the work may be taken in such a way that either a broader acquaintance with insects and the principles of classification is afforded, or intensive work may be done on selected groups.

221. ADVANCED GENERAL ENTOMOLOGY. Elective, first semester. Class work, three hours. Three semester credits. The class work consists of lectures, assigned readings, and written reports. Prerequisite: General Entomology. Associate Professor Smith.

The purpose of this course is to give the advanced student a comprehensive view of the broad biological aspect of the subject and an understanding of the relation of insects to the complex of environmental factors. The various subdivisions of entomology are correlated and used as a basis in the presentation of general principles as well as illustrating the problems of maintenance and the various ways in which insects have solved them. The course includes, in part, a detailed consideration of the following: Phylogeny of insects and their relatives; metamerism; reproduction; gynandromorphism;

parthenogenesis; pædogenesis; polyembryony; respiration; temperature; embryology; internal and external metamorphosis; metabolism; aquatic insects, their evolution, adaptations, and activities; regeneration; experimental work with insects; insect parasitism; color and coloration; insects in relation to other organisms; insect behavior; and geological and geographical distribution.

226. MEDICAL ENTOMOLOGY. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: General Entomology. Associate Professor Smith.

The subject matter of this course deals with insects and other arthropods as transmitters and disseminators of disease, attention being confined to that phase of the subject which pertains to the health of man. Emphasis is placed on the various important species of insects which are related to disease, the pathogenic organisms and their relation to insects, and the preventive measures which have, up to date, proved most effective. Some attention is also given to the important theories which underlie this subject and to important investigations in progress at the present time.

Laboratory.—The laboratory work consists of a careful study of insects and other arthropods which may affect the health of man directly, and of those which may be instrumental in the dissemination of disease; also a study of the causative organisms of certain insect-borne diseases and the methods by which these organisms are transmitted.

228. ADVANCED APICULTURE. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: The regular course in apiculture (Ent. 111) or its equivalent. Associate Professor Merrill.

This course is a continuation of the regular course in apiculture. The primary object of this course is to make a detailed study of the principles of bee behavior, and how these are related to practices of good beekeeping, special attention being given to the different forms of the behavior exhibited by the bees throughout the different seasons of the year, and the beekeeping practices which should be adopted to conform to this behavior. Since it begins in the first semester, problems that apply particularly to that time of the year are taken up, such as preparation for wintering, feeding for winter, and winter protection. Observations are made on the merits and demerits of different systems of wintering. Extracting honey, preparing it for market, marketing, and other advanced subjects are studied.

230. INSECT HISTOLOGY. Elective, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisites: General Entomology and General Cytology. Associate Professor Smith.

This course is designed primarily for students who expect to do technical work in entomology. The work of the laboratory consists of the application of those special methods of gross and microscopical technic which are applicable to insects; practice in the use of the various special methods of killing and fixing, clearing, sectioning, staining and mounting the various groups of insects and insect tissues afforded. A study of insect tissues constitutes an important part of the course. The lectures deal with the more general matters of technic and insect histology.

231. ENTOMOLOGICAL AND ZOÖLOGICAL LITERATURE. Elective, first semester. Lectures, one hour. One semester credit. Prerequisite: General Entomology. Associate Professor Smith.

This course deals with the literature of entomology, special consideration being given to bibliographical works and their uses. Since the literature of entomology is, to a considerable extent, inseparably associated with that of zoölogy, the course is of equal importance to the students of both subjects. The course is designed primarily to meet the needs of advanced undergraduates and graduate students who are beginning research work. General and special bibliographical sources, foreign and American scientific journals and

serials, and the construction of special bibliographies according to approved methods constitute the chief subjects for consideration. All advanced students of entomology and zoölogy are expected to take this course.

236. ZOÖLOGY AND ENTOMOLOGY SEMINAR. Elective, both semesters. One two-hour session each week. One semester credit. Prerequisite: Consult seminar committee.

This course consists in the presentation of original investigations, reviews of papers appearing in current journals, summaries of recent advances in the various fields, and discussion of the various aspects of the fundamental problems of modern biology.

238. ENTOMOLOGICAL PROBLEMS. Elective, both semesters. Two to four semester credits. Prerequisites: Consult instructors. Professor Dean, Doctor Merrill, Doctor Smith, Associate Professor McColloch, and Assistant Professor Hayes.

Students having sufficient training may, with the approval of the head of the department, study a special problem in one of the following subjects: Insect life history, insect control, insect classification, apiculture, insects injurious to stored grain and milled products, household insects. Such work must be pursued under the direct supervision of some member of the departmental staff.

FOR GRADUATES

316. RESEARCH IN ENTOMOLOGY. Advanced students having sufficient fundamental training may, with the approval of the head of the department, undertake original investigation in one of the following fields of entomology: taxonomy, morphology, economic entomology. Such work is pursued under the direct supervision of some member of the departmental faculty and the final results may, if of sufficient merit, be used to fulfill the thesis requirement for the master's degree. The special student may, if willing and capable, be drawn into the research work of the Agricultural Experiment Station during the summer vacation and receive training in the investigation of economic problems. Prerequisites: (1) For research in taxonomy and morphology: General Entomology, Insect Morphology I, Taxonomy of Insects I, and Cytology. (2) For research in economic entomology: General Entomology, General Economic Entomology, Insect Morphology I, and Taxonomy of Insects I. Professor Dean, Associate Professors Merrill and Smith, Associate Entomologist McColloch, and Assistant Professor Hayes.

Geology

Professor NABOURS
Associate Professor NEWMAN
Instructor SPERRY

The materials and agencies that have made the earth are studied in the field and class, and by means of maps, charts and specimens. The purpose of these courses is to arouse in the student an appreciation of the general principles underlying the structure and history of the earth and the forces at work on it.

Some charts, a series of lantern slides, a representative collection of fossils and minerals, and a surrounding country exhibiting considerable variety of hill and valley, limestone, glacial drift and sand dunes, are available for illustrative purposes.

COURSES IN GEOLOGY

FOR UNDERGRADUATES

102. ENGINEERING GEOLOGY. Junior year and elective, second semester. Class work, two hours; laboratory, six hours. Four semester credits. Professor Nabours and Associate Professor Newman.

The class work consists of a study of the general principles of structural and dynamic geology, and of rocks in respect to their mineral composition, structural properties, changes in weathering, etc. It is given by lectures, textbooks and references.

Laboratory.—The laboratory work comprises the observation and description of such structural and dynamic features as the locality affords, and a study of the principal rocks and their mineral constituents.

103. GENERAL GEOLOGY. Freshman year and elective, second semester. Class work, three hours; two or three field trips during semester. Three semester credits. Mr. Sperry.

This course consists of a study of the structure of the earth and of the agencies which modify the materials and determine the topographic features, with some of the history as indicated by the records in the rocks.

FOR GRADUATES AND UNDERGRADUATES

201. HISTORICAL GEOLOGY. Elective, second semester. Class work, two hours; two field trips during the semester. Two semester credits. Prerequisites: Engineering Geology, Elementary Zoölogy, and General Botany, or equivalent. Professor Nabours.

This course takes up a brief study of the history of the earth as shown by the record in the rocks. Special emphasis is placed on the history of life as indicated by the fossils.

History and Civics

Professor PRICE
Professor ILES
Associate Professor JAMES
Assistant Professor PEINE
Instructor OREM*
Instructor RICE

Training for citizenship, breadth of view, historic-mindedness, fairness of judgment and general culture are constant and specific aims of each course offered by the Department of History and Civics. As a result of the training received in these courses the student is better prepared to understand and appreciate the institutions in the midst of which he lives and of which he is a part. He is also prepared to act more wisely his part as a leader in good citizenship wherever his lot may be cast. In our modern age and self-governing nation, and in an institution supported by the state and nation, it would seem to be the imperative duty of every student to secure specific training for wise and effective leadership in the governmental affairs of the state and nation that are thus preparing him for life and its duties.

COURSES IN HISTORY

FOR UNDERGRADUATES

101. AMERICAN HISTORY I (*or* BEGINNINGS OF THE AMERICAN NATION). Junior and senior years, both semesters and summer school. Class work, three hours. Three semester credits. Professor Price.

This course gives special emphasis to the industrial phases of the origin and development of American nationality and democracy to the end of the War of 1812. It also includes our constitutional and political development, especially with reference to origin, basis, cause, and effect. It aims to develop historic-mindedness; that is, training the student to put himself in the other fellow's place and understand fairly "the why." The European origin and background of American history; the evolution of colonial life, industries, and institutions; why we became an independent nation; our westward expansion; the establishing of nationality, and the development of government by the people, are phases definitely emphasized. Instruction is given by means of lectures, readings, and recitations, based on *An American History Notebook*, by R. R. Price.

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* Absent on leave, 1921-'22.

103. AMERICAN HISTORY LECTURES. Elective, both semesters and summer school. Two one-hour lectures a week. No credit. No prerequisite. Professor Price.

This series of lectures follows the outline given in *An American History Notebook,* which is used as the basis for the work in American History I, American History II, and American History III. Therefore this course is directly helpful to students taking any one of the three courses named above. To students taking only one of the above-named courses, these lectures give some insight as to the content of the other two courses. Since *An American History Notebook* has been adopted by the State Textbook Commission for use in the schools of the state, these lectures are also directly helpful for any student who expects to teach American history either in the grades or in high school. Only those who are regularly assigned to this course are permitted to attend the lectures; and when the student is assigned, regular attendance is required. There are no recitations and no examinations connected with this course. Students are permitted to ask questions at the close of each lecture. The course is based on Price's *An American History Notebook.*

105. AMERICAN INDUSTRIAL HISTORY. Sophomore and senior years, both semesters and summer school. Class work, three hours. Three semester credits. Assistant Professor Peine.

This course traces the history of American agriculture, manufactures, and commerce with related activities from their colonial beginnings to the present. It includes a survey of the physical basis for American history, the growth of population and its expansion across the continent, and the reflection of these things on our industrial, social, and political life. European developments, especially the industrial revolution and the expansion of commerce, are studied for the light they throw on American history. Finally, throughout the course an attempt is made to trace the growth of our national industrial organization and its present-day aspects. This course is based on a text, such as Lippincott's *Economic Development of the United States,* supplemented by Coman's *Industrial History of the United States* or Bogart's *Economic History of the United States,* and the student is held responsible (*a*) for the contents of his text and (*b*) for assigned work and lectures.

121. ENGLISH HISTORY. Sophomore year, both semesters and summer school. Class work, three hours. Three semester credits. Not open for credit to students who offer English history for entrance; such students should take History 226A or some other three-hour College course in history. Associate Professor James.

This is a general survey of the whole field of English history with some emphasis on the modern period. It includes the outlines of political history and the essentials of English constitutional development. Special attention is given to the development of the empire, to the English background of American history, and to the industrial and social development of the English people. The work is based on Cross's *A Shorter History of England and Greater Britain,* with lectures and assigned readings.

126. CURRENT HISTORY. Freshman year, both semesters and summer school. Class work, one hour. One credit each semester. Open as elective for not to exceed a total of four semester credits. Associate Professor James.

The content of this course differs each semester from that of any other semester. The text for the course is a good weekly or monthly magazine, such as *The Independent, The Outlook, The Review of Reviews, Current History,* or *World's Work,* together with the daily papers and some library references. The course is so conducted as to give a wide outlook on the world of to-day, and a better understanding of the conditions and institutions in the midst of which we live. It includes a study of as much of the everyday essentials of American and foreign governments, of international relations, of international law, of biography, of industrial developments, and of history—suggested each week by the events of the week—as can be crowded into the one hour of the recitation period. It directs the student to good habits of news reading of the right sort.

127. TEACHERS' COURSE IN HISTORY. Elective, summer school. Class work, two hours. Two semester credits. Professor Iles.

This is a seminar course of discussion based on Henry Johnson's *Teaching of History in Elementary and Secondary Schools,* together with Mace's revised work, *Method in History,* and supplemented by a study of the Report of the Committee of Seven, and of the Committee of Five on *History in the Secondary Schools,* and the Committee of Eight on *History in the Elementary Schools.* A critical examination is made of special books on methods in history and civics, such as Wayland's *How to Teach American History,* and of special articles in the *History Teachers' Magazine.* The different texts in history and civics are critically investigated as to points of excellence or weakness, including lectures on the content or viewpoint of each. Information is also given as to the best illustrative material and helps in the teaching of history and civics. The course reveals the evolution in the writing of history, and the growing importance of history and civics in the modern school curriculum, together with the improving viewpoint as to content of both the history and the civics courses.

FOR GRADUATES AND UNDERGRADUATES

202. AMERICAN HISTORY II (*or* WESTWARD EXPANSION AND SECTIONALISM). Elective, both semesters and summer school. Class work, three hours. Three semester credits. Professor Price.

This course concerns itself with the industrial conditions, the issues and the leaders of the middle period of our history, from the close of the War of 1812 to the Civil War. Among the subjects investigated are the industrial and political conditions in America in 1816; the Missouri Compromise; the anti-slavery agitation; the Webster-Hayne debate; South Carolina nullification; annexation of Louisiana, Florida, and especially Texas; the Mexican War, and the resulting preponderance of the slavery issue; the Compromise of 1850; the Kansas-Nebraska bill and the early Kansas struggle "to the stars through difficulties," including the various constitutions and the final admission to statehood; the origin of the Republican party; the election of 1860; and the events leading immediately to the secession of the Southern States. Instruction is by means of lectures, recitations, and readings, based on *An American History Notebook,* by R. R. Price.

203. AMERICAN HISTORY III (*or* THE NEW INDUSTRIAL AGE). Elective, second semester and summer school. Class work, three hours. Three semester credits. Professor Price.

This course opens with a review of the industrial conditions in America just before the Civil War; next a careful examination is made of the industrial effects of that war; finally a study of the political and constitutional history of the last half-century is made in the light of the industrial conditions and developments of the same period. Manufactures, commerce, and especially agriculture, are carefully examined, particularly with reference to the South and West. The new developments in political parties and the new devices in self-government are carefully studied as to developments, cause, and present conditions. The new America, with its spirit of nationality, its emphatic self-government, and its new world power and responsibility, are studied especially in the light of the new industrial developments. Instruction is imparted by lectures, recitations, assigned readings, and special reports, based on Price's *American History Notebook.*

204. AMERICAN AGRICULTURAL HISTORY. Elective, first semester and summer school. Class work, three hours. Three semester credits. Assistant Professor Peine.

This course is intended primarily for students in the Division of Agriculture. It devotes itself chiefly to the history of American agriculture. The course starts with a study of European background and Indian beginnings. It traces and compares the agricultural development of New England, the South and the central colonies during the colonial period; then follows the westward movement into the prairie regions of the Mississippi valley, with the

distinctive American developments in methods, live stock, and especially farm machinery. The course gives special consideration to the South with its cotton, to the Northwest with its wheat, to the Southwest with its live stock, and to the corn belt with is varied industries. A special study is made of the last quarter-century, when varied industries, more intensive farming, and the high cost of living are replacing extensive mining of the soil, with its remarkable era of low cost of living, its sudden accumulation of wealth, and its rapid development of civilization. The relation of all this to our own state is constantly kept in view. This course should be supplemented by the course in American Political History. Instruction is given by lectures and recitations, readings, and reports.

206. AMERICAN POLITICAL HISTORY. Elective, first semester. Class work, two hours. Two semester credits. This course is especially intended to supplement course 204 or course 105; it is not open for credit to students who have credit in course 202. Professor Iles.

This course gives the story of the origin, development, leaders, and function of political parties in America, and studies the issues and results of the more important presidential elections. It traces the growth of nationality and the development of self-government through American history, but with special reference to present tendencies. This is a very desirable course for any one who would understand and appreciate present political and governmental conditions and tendencies.

207. PAN-AMERICA. Elective, both semesters. Class work, two hours. Two semester credits. Associate Professor James.

The history, government, and industrial conditions of Canada, Mexico, and the South American nations, and the interrelations of each of these and the United States are studied in this course.

223. MODERN EUROPE (SINCE 1814). Sophomore and junior years and elective, both semesters and summer school. Class work, three hours. Three semester credits. Professor Iles.

This course traces the evolution of the modern European nations since 1814, with special attention to political organization, industrial development, and colonial expansion. Political problems and social and economic adjustments due to the Great War are included. Recitations, lectures, and assigned readings. Text: Hayes's *A Political and Social History of Modern Europe,* Vol. II, with special studies on the World War.

225. HISTORY OF THE HOME. Elective, second semester. Class work, three hours. Three semester credits. Miss Orem.

This course includes the history of the primitive family; the Hebrew family; the family life of the Greeks and of the Romans; and the history of the home and family during the Middle Ages, including the influence of the Christian church. Next, the history of the English family in the seventeenth and eighteenth centuries and of the American colonial home is studied. This is followed by a study of the industrial revolution and its effects upon family life. Finally, the history of the family during the nineteenth century, the present situation and tendencies are examined. The course is based primarily on Goodsell's *History of the Family,* supplemented by lectures and special studies.

226A. MODERN ENGLAND AND THE BRITISH EMPIRE. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Entrance credit in English history or three hours College credit in history, preferably History 121. Associate Professor James.

This course begins approximately with the accession of the Tudors in 1485. Special emphasis is placed on the beginnings and growth of world empire, England's part in international affairs, the economic and social history of the British Islands, and the changes by which England's government has become a practical democracy. The work closes with a survey of England and her empire as they exist to-day with their part of the World War, together with

the effects of that war on the British Empire. Instruction is by lectures, assigned readings, and reports.

228. IMMIGRATION AND INTERNATIONAL RELATIONS. Elective, second semester. Class work, two hours. Two semester credits. Professor Price.

The title of the course suggests its content. It includes a study of the causes and the effects—economic, social, and political—of the coming of the foreigner to our shores, including the colonial period, the middle period, and the period since our Civil War, with special reference to the recent changes both as to the character of the immigrants and as to the conditions in Europe and in America that affect the number and quality of immigrants. The second part of the course includes a clear survey of the important epochs in our diplomatic history. The entire course deals with subjects of greatest moment to our nation, especially since the World War, subjects that should be correctly understood by every citizen, but especially by those who are to be our leaders. The text for the first part of the course is Fairchild's *Immigration—A World Movement and Its American Significance*. The text for the second part is Latane's *From Isolation to Leadership*. This course is conducted by lectures, assigned readings, recitations, and reports.

COURSES IN CIVICS

FOR UNDERGRADUATES

151. AMERICAN GOVERNMENT. Junior and senior years, both semesters and summer school. Class work, three hours. Three semester credits. Professor Iles.

This course in civics, or actual government, reviews definitely the fundamental principles and operations of our state and national governments, including the essential principles of constitutional law, but gives special emphasis to the actual present-day conditions and movements in our governmental and political life. Among the subjects especially studied are the initiative and referendum, suffrage and primary elections, the recall, city government and government of territories, the regulation of commerce, conservation of national resources, national defense, taxation and finance, the actual methods of congressional activity, and the function, organization, power, and importance of political parties in our government. The course is primarily based on Munro's *The Government of the United States*. Throughout this course special and definite attention is given to recent and current events in governmental activities.

158. COMMUNITY CIVICS. Elective, summer school. Class work, two hours. Two semester credits. Another hour of credit may be obtained by a limited number of students who have time to devote to special problems. Professor Iles.

This course deals chiefly with the functions of government as manifested in community life. It is designed to afford a basis both in subject matter and in method for those teachers who desire to present civics in direct relation to individual welfare. The use of local material in teaching civics is illustrated and the structural side of government is reviewed as far as is necessary to show the means through which the functions are performed.

163. BUSINESS LAW I. Junior and senior years, both semesters. Class work, one hour. One semester credit. Assistant Professor Peine.

This course includes a careful study of the essential principles in the law of contracts, of sales, and of negotiable instruments. It should be followed by Business Law II. Text: Huffcut's *Elements of Business Law,* or Bays' *Business Law.*

168. BUSINESS LAW II. Elective, both semesters. Class work, one hour. One semester credit. Prerequisite: Business Law I. Assistant Professor Peine.

This course includes a careful study of the more fundamental principles of the law of agency, of insurance, of guarantee and damages; of partnership

and corporations; of bailments, including common carriers; of torts, especially the law of negligence; and of patent rights. Text: Huffcut's *Elements of Business Law,* and the *Kansas Statutes.*

175. FARM LAW. Elective, both semesters. Class work, two hours. Two semester credits. Assistant Professor Peine.

This course outlines the following subjects as far as the time permits: *First.* The title to the farm—deeds, etc.; boundaries of the farm—fences, etc.; water rights, including irrigation; police power of the state—quarantine, destruction of diseased animals, pure food; live stock—liability of owner, trespassing animals, estrays. *Second.* Contracts, including hired help, etc.; farm crops and their ownership; renters; sales, including warranty, etc.; factors, or commission merchants; common carriers, such as railroads; insurance. The course is based on Bays' *Business Law,* supplemented by Green's *Law for the American Farmer,* and by the *Kansas Statutes.*

FOR GRADUATES AND UNDERGRADUATES

252. COMPARATIVE GOVERNMENT. Elective, first semester. Class work, two hours. Two semester credits. Professor Iles.

This course comprises a study of the leading features, especially with regard to administration, of certain European governments such as England, France, and Germany, and a comparison of essential features with government in the United States. It is planned to supplement and round out the course in American Government. Text: Macy and Gannaway's *Comparative Free Government* or Holt's *Introduction to the Study of Government.*

256. INTERNATIONAL LAW. Elective, second semester. Class work, two hours. Two semester credits. Associate Professor James.

This course includes a discussion of the fundamental principles of international law and international relations, and rights and obligations, public and private, in time of peace and in time of war, are studied, especially in the light of recent developments, such as the Hague conferences. Text: Stockton's *Outlines of International Law.*

Industrial Journalism and Printing

Professor CRAWFORD
Associate Professor ROGERS
Associate Professor KEITH
Instructor POLSON
Instructor AMOS

The work in industrial journalism and printing is designed to accomplish two purposes: the preparation of students in other fields to do occasional writing for newspapers and other periodicals on subjects of special interest; and the training of students fundamentally interested in journalism for positions on farm journals, newspapers, and other publications, particularly where writing on agriculture and other industrial subjects is in demand. The instruction considers the requirements of newspapers, agricultural papers, trade publications, and general magazines, and the ethical problems of the profession of journalism. *The Kansas Industrialist,* the official paper of the College, is under the editorial and mechanical direction of the department. The office of *The Kansas State Collegian,* the student semi-weekly newspaper, is in the department practice room. *The Brown Bull,* a humorous magazine which has aroused much favorable comment among newspaper men, is published by students in the department. Students write also for general newspapers, farm journals, and magazines.

Attention is given to the mechanical side of the profession in the instruction in printing, two semesters of which are required of all students taking the curriculum in industrial journalism. Printing has been taught in the institution continuously since 1874—the longest period during which instruction in the subject has been given in any American college.

The equipment for instruction in journalism and printing is that of a practical publishing and printing plant.

A large amount of timely agricultural and other information is furnished regularly to Kansas newspapers, farm journals, and other publications. Special assignments are covered for these periodicals, and special inquiries are answered.

COURSES IN PRINTING

FOR UNDERGRADUATES

101. PRINCIPLES OF TYPOGRAPHY I. Freshman year, first semester. Class work, two hours; laboratory practice, three hours. Three semester credits. Associate Professor Keith.

The course comprises a study of the case, the point system, and the measurement of type and stock. The history of printing is presented and a study is made of the development of the various typographical styles. Practice is given in setting straight matter. Emphasis is laid on accuracy.

104. PRINCIPLES OF TYPOGRAPHY II. Freshman year, second semester. Class work, two hours; laboratory practice, three hours. Three semester credits. Associate Professor Keith.

The work of the preceding course is continued, a study being made of type faces and the typography of advertisements and head display. The principles of effective make-up are treated. The use of cost systems in printing offices receives attention.

108. AD. COMPOSITION I. Elective, first semester. Laboratory, six hours. Two semester credits. Prerequisite: Principles of Typography II. Associate Professor Keith.

This course consists of a study of the principles of display and design as applied to newspaper and magazine advertisements. Practical work is given in setting ads. for magazines, and newspapers are studied and criticised.

111. AD. COMPOSITION II. Elective, second semester. Laboratory, six hours. Two semester credits. Prerequisite: Ad. Composition I. Associate Professor Keith.

This course is a continuation of Ad. Composition I. More complicated work is studied.

114. JOB COMPOSITION I. Elective, first semester. Laboratory, six hours. Two semester credits. Prerequisite: Principles of Typography II. Associate Professor Keith.

In this course the differences in the requirements for job composition and ad. composition are emphasized. The proper selection of type faces, borders, and ornaments is considered. The work consists of setting jobs and locking them up for the pressroom.

118. JOB COMPOSITION II. Elective, second semester. Laboratory, six hours. Two semester credits. Prerequisite: Job Composition I. Associate Professor Keith.

In this course color work, tabular forms, and other complicated kinds of job work are studied.

122. PLATEN PRESSWORK I. Elective, first semester. Laboratory, six hours. Two semester credits. Prerequisite: Ad. Composition I or Job Composition I. Associate Professor Keith.

This work consists of practical platen presswork under ordinary printing-office conditions. The student is taught to feed press and make ready the jobs, and is given instruction in selection of inks and the care of printing rollers.

126. PLATEN PRESSWORK II. Elective, second semester. Laboratory, six hours. Two semester credits. Prerequisite: Platen Presswork I. Associate Professor Keith.

This work is a continuation of Platen Presswork I. The student is given more advanced work in mixing inks and in color work.

131. CYLINDER PRESSWORK I. Elective, first semester. Laboratory, six hours. Two semester credits. Prerequisite: Platen Presswork II. Associate Professor Keith.

In this course the student is taught the fundamentals for work on all kinds of cylinder presses. He is taught how to make the work ready and how to feed, and is given instruction in the general care and handling of cylinder presses.

136. CYLINDER PRESSWORK II. Elective, second semester. Laboratory, six hours. Two semester credits. Prerequisite: Cylinder Presswork I. Associate Professor Keith.

This is a continuation of Cylinder Presswork I.

139. PRINTING PAPERS AND SUPPLIES. Elective, first semester, on permission of the instructor. Laboratory, six hours. Two semester credits. Associate Professor Keith.

This course is intended to give the student the fundamental knowledge necessary for the proper selection and efficient buying and handling of printing supplies. Practical work is also given in figuring and cutting stock for the pressroom.

FOR GRADUATES AND UNDERGRADUATES

201. PRINTING COST ACCOUNTING. Elective, second semester, on permission of the instructor. Class work, two hours. Two semester credits. Associate Professor Keith.

Cost-finding systems adapted to various sizes and kinds of printing plants are studied in detail in this course. The figuring of costs, the economical routing of work through the plant, the purchase of stock and other supplies, and other problems of management are treated. All books and records commonly kept in printing offices are studied.

COURSES IN INDUSTRIAL JOURNALISM

151. ELEMENTARY JOURNALISM. Sophomore year, first semester. Class work, two hours. Two semester credits. Miss Polson.

This course is intended to give the student practical experience in the fundamentals of news writing. Methods of obtaining news of various types, the writing of the lead, and the general styles of the news story are carefully considered.

157. INDUSTRIAL WRITING. Sophomore year, second semester. Class work, two hours. Two semester credits. Prerequisite: Elementary Journalism. Miss Polson.

This course applies the principles of journalism to the treatment of industrial subjects, such as are found in agriculture, engineering, home economics, and more general scientific research. The work of the College and the Experiment Stations affords the basis for study and practice.

164. AGRICULTURAL JOURNALISM. Junior year, both semesters. Class work, one hour. One semester credit. Associate Professor Rogers.

The course is intended to supply students in the curriculum in agriculture with sufficient knowledge of the principles of news writing, as applied to agriculture, to enable them to become occasional contributors to newspapers and farm journals. Much practice in agricultural writing is given in the course.

167. INDUSTRIAL FEATURE WRITING I. Junior year, first semester. Class work, two hours. Two semester credits. Prerequisite: Industrial Writing. Associate Professor Rogers.

This course takes up the feature story, with careful attention to both the informative and the entertaining type. The principles underlying the feature story are applied to writing on agricultural and other industrial subjects. The demands of newspapers, farm journals, and general magazines for writing of this character are analyzed.

171. INDUSTRIAL FEATURE WRITING II. Junior year, second semester. Class work, two hours. Two semester credits. Prerequisite: Industrial Feature Writing I. Associate Professor Rogers.

The course deals specifically with agricultural journals, trade journals, and other publications of highly specialized character. The writing which is done in the course is done for publications of these types, and the students are required to submit their material to editors. A beginning is made in the study of the desk work required on a technical journal, including the handling of copy, the use of illustrations, and the principles of make-up from the editorial standpoint.

179. PRINCIPLES OF ADVERTISING. Junior year, second semester. Class work, three hours. Three semester credits. Professor Davis, of the Department of English.

This course considers the fundamentals of advertising as a part of modern business. The study of the goods to be advertised, the analysis of the market, the psychology of advertising, the preparation of advertising copy, and other important matters are taken up. The student is required to make application of the principles brought out in the course.

154, 160, 175, 183. JOURNALISM PRACTICE I, II, III, IV. These courses comprise laboratory practice accompanying courses 151, 157, 167, 179. Sophomore and junior years. Six hours. Two semester credits for each course. Prerequisite for each semester is the work of all preceding semesters in Journalism Practice. Professor Crawford, Associate Professor Rogers, and Miss Polson.

The work in Journalism Practice follows closely the other courses in journalism with which it is taken. Students are required to gather news, both assigned and unassigned, and to write the stories in the department workroom. The College campus is divided into "runs," which the students must cover at regular intervals, and assignments are given at specific times. The work given is suited to the advancement of the student. As he progresses in his work he is required not only to obtain news and feature stories, but to edit copy, to read proof, to write heads, to prepare editorials, to select matter worthy of reprint, and to perform other duties required in newspaper and magazine offices. Emphasis is laid on popular treatment of industrial subjects. The instructor in charge gives the students training in looking up references and in handling technical subjects simply but accurately, and also makes specific criticism on the work done by the students.

FOR GRADUATES AND UNDERGRADUATES

251. CIRCULATION AND ADVERTISING PROMOTION. Senior year, first semester. Class work, three hours. Three semester credits. Prerequisite: Industrial Feature Writing II. Professor Crawford.

This course deals with the business management of periodical publications. The building up of circulation and the soliciting of advertising receive special emphasis. Premiums and other plans for increasing circulation are discussed. The advertising agency, the circulation analysis, and the fixing of advertising rates are treated.

254. COPY READING. Senior year, first semester. Laboratory practice, six hours. Two semester credits. Prerequisite: Industrial Feature Writing II. Associate Professor Rogers.

The course continues the work begun in Industrial Feature Writing II, and gives practice in the work required of the copy reader, whether on a newspaper, an agricultural journal, or some other publication. A study is made of newspaper style and of magazine and book style, the distinctions between the two being clearly pointed out. The writing of heads and titles and proof reading receive detailed attention. A large amount of copy is actually handled in class, and papers of various types are made up as practice assignments.

257. EDITORIAL PRACTICE. Senior year, second semester. Class work, two hours. Two semester credits. Prerequisite: Copy Reading. Professor Crawford.

The course deals not only with the writing of editorials suitable for farm papers, trade papers and newspapers, but with the conduct of the editorial offices of a periodical publication. Students obtain instruction and practice in writing the matter commonly prepared by the editorial staff of a paper, including editorials, paragraphs, and exchange matter. The acceptance and rejection of contributions receive consideration. Editorial policies and their influence form the subject of careful discussion.

260. ETHICS OF JOURNALISM. Senior year, second semester. Class work, two hours. Two semester credits. Prerequisite: Circulation and Advertising Promotion. Professor Crawford.

The course treats the ethics of journalism as exemplified in the use of contributed matter, in the work of the reporter or staff writer, in the editorial conduct of the paper, and in the handling of circulation and advertising. The federal and state laws relating to periodical publications, to advertising, to libel, and to authors' rights, including the federal law of copyright, are treated. The attitude of periodical publications on matters of ethics and law is observed at first hand by the students.

265. MATERIALS OF JOURNALISM. Elective, first semester. Class work, two hours. Two semester credits. Miss Polson.

This is a course intended primarily for the general student who desires to obtain a knowledge of the principal newspapers and magazines, and to be able to form judgments as to the accuracy and adequacy of news reports and other published matter. The materials handled by the publications, the methods of treatment, and the character of the editorial comment are carefully presented. Attention is given to the several types of journalism.

270. MAGAZINE FEATURES. Elective, second semester, on permission of the instructor. Class work, two hours. Two semester credits. Associate Professor Rogers and Miss Polson.

The course is intended for advanced students who desire to prepare literary work suitable for publication in magazines. The matter of the courses is varied to suit the needs and desires of the students, emphasis being laid upon such types of magazine writing as members of the class wish to practice.

274. HISTORY OF JOURNALISM. Elective, first semester. Class work, two hours. Two semester credits. Professor Crawford.

The course deals with the history of journalism from its beginning and with the history of printing so far as this is concerned with periodical publications. Most of the time of this course is given to journalism in England, Canada and the United States, though some attention is given to publications of other countries. The differentiation of journalism in the nineteenth century, and the several types which arose because of this are the subjects of careful study. Particular attention is given to the fields of agricultural and trade journalism.

278. JOURNALISM SURVEYS. Elective, second semester. Laboratory work, six hours. Two semester credits. Professor Crawford.

This course comprises the careful investigation of the periodical reading matter of communities. The information obtained is carefully tabulated, and studies are made of the relation of the reading matter to the industrial, economic, social, and moral life of the communities.

282. COLUMN CONDUCTING. Elective, second semester. Class work, two hours. Two semester credits. Given 1922-'23 and alternate years thereafter. Professor Davis of the Department of English.

The course deals with the conducting of the so-called column, humorous or semi-serious. This affords opportunity for writing paragraphs, light verse, and similar material. Practice in writing humor constitutes the principal work of

the course; but as a basis for this, studies are made of the humorous magazines and of humor in other periodicals.

286. CURRENT PERIODICALS. Elective, second semester. Class work, two hours. Two semester credits. Professor Crawford.

The course comprises a study of current periodicals of various types. Special emphasis is laid on the material that they contain and the nature of its appeal to the reader. It is a nontechnical course, intended to give general students some knowledge of the field of current periodical literature.

290. JOURNALISM FOR VOCATIONAL TEACHERS. Elective, summer school. Class work, four hours. Two semester credits. Associate Professor Rogers.

This course is offered to meet the demand of teachers who feel the need of special training in news gathering and editing to enable them to use effective publicity in connection with the work of their schools. How to write, edit, and publish a school paper, and how to write school news that will be acceptable to local papers, are taken up in the course. Several hundred newspapers and magazines received by the Department of Industrial Journalism afford practical news material. Careful attention is given to the publication of high-school papers, and problems of staff organization, editorial methods, business management, mechanical make-up, and faculty advice are discussed. A large number of high-school publications are available for use by students in the course. Actual practice on a model school paper is required of each student taking the work.

FOR GRADUATES

Special courses will be arranged to meet the specific needs and desire of individual graduate students. These courses will in general embody creative literary work or detailed research in specialized journalism.

Library Economy

Librarian SMITH
Associate Librarian DERBY
Reference Librarian DAVIS
Reference Assistant ST. JOHN

The Library supplements the work of every department of the College. It is a storehouse of knowledge for every student. It supplies information and the latest results of scientific research for every instructor. The Library is thus essential to the College, forming, as it were, a center from which its various activities radiate.

In order that the Library may perform its functions with the highest degree of efficiency it is necessary that instruction be given regarding its use. With this thought in mind a course is offered the purpose of which is to familiarize the student with scientific, up-to-date methods in the use of books and to acquaint him with the best general reference books as well as with standard works on various subjects. Placed at the beginning of his College course it should tend to increase largely his efficiency in study throughout the entire course.

COURSE IN LIBRARY ECONOMY

FOR UNDERGRADUATES

101. LIBRARY METHODS. Freshman year, both semesters. Class work, one hour. One semester credit. Associate Librarian Derby, Miss Davis, and Miss St. John.

The course consists of lectures on classification and arrangement of books in the Library; card catalogues; the principal works of reference, such as dictionaries, encyclopedias, atlases, and standard works in history, literature, economics, quotations, statistics, etc.; public documents and their indexes; indexes to periodicals, etc. Instruction is given, also, in methods of indexing current reading for purposes of future reference.

Mathematics

Professor REMICK
Professor WHITE
Associate Professor STRATTON
Assistant Professor MCKITTRICK
Assistant Professor HYDE
Assistant Professor LEWIS
Instructor HOLROYD
Instructor EDGERTON

In an institution that stands as an exponent of the industrial type of education, mathematics should occupy an important place. Training in the exact science is valuable not only for its own sake but also on account of its manifold applications. On this basis the courses in mathematics are offered primarily with the following ends in view: (1) the attainment of mental power and accuracy in the interest both of general culture and special application; (2) the acquirement of facts and processes that will provide the student with an indispensable tool for further scientific and technical study.

COURSES IN MATHEMATICS

FOR UNDERGRADUATES

101. PLANE TRIGONOMETRY. Freshman year, first and second semesters. Class work, three hours. Three semester credits. Prerequisites: Plane geometry, and one and one-half years of high-school algebra. Professor Remick, Professor White, Associate Professor Stratton, Assistant Professors McKittrick, Hyde and Lewis, and Miss Holroyd.

This course treats of the functions of acute angles, right triangles, goniometry, oblique triangles, practical problems. Text: Bauer and Brooke's *Plane and Spherical Trigonometry.*

104. COLLEGE ALGEBRA. Freshman year, both semesters. Class work, three hours. Three semester credits. Prerequisites: Plane geometry, and one and one-half years of high-school algebra. Professor Remick, Professor White, Associate Professor Stratton, Assistant Professors McKittrick, Hyde and Lewis, and Miss Holroyd.

Elementary topics, functions and their graphs, quadratic equations are rapidly reviewed. The further treatment includes the subjects of complex numbers, theory of equations, permutations and combinations, partial fractions, logarithms, and determinants. Text: Rietz and Crathorne's *College Algebra.*

107. COLLEGE ALGEBRA A. Freshman year, second semester. Class work, five hours. Five semester credits. Prerequisites: Plane geometry and one year of high-school algebra. Professor Remick, Professor White, Associate Professor Stratton, Assistant Professors McKittrick, Hyde and Lewis, Miss Holroyd, and Mr. Edgerton.

After a brief review of elementary subjects, a thorough treatment of quadratics, ratio, proportion, progressions, and the binomial theorem for positive exponents is given. The remainder of the course follows closely the chief content of course 104. Text: Wells and Hart's *Second Course in Algebra,* enlarged edition.

110. PLANE ANALYTICAL GEOMETRY. Sophomore year, first semester. Class work, four hours. Four semester credits. Prerequisites: Plane Trigonometry, and College Algebra. Professor White, Associate Professor Stratton, and Associate Professor Hyde.

This course treats of coördinate systems, projections, loci, straight line, conics, parametric and empirical equations, with a discussion of the general equation of the second degree. Text: Tanner and Allen's *Brief Course in Analytical Geometry.*

113. CALCULUS I. Sophomore year, second semester. Class work, five hours. Five semester credits. Prerequisite: Plane Analytical Geometry. Professors Remick and White, and Associate Professor Stratton.

The usual topics of differential calculus are considered together with integration of standard forms, definite integrals, rational fractions, and integration by parts. This course contains problems closely related to the work of engineering students. Text: Love's *Differential and Integral Calculus.*

116. CALCULUS II. Junior year, first semester. Class work, three hours. Three semester credits. Prerequisite: Calculus I. Professors Remick and White, and Associate Professor Stratton.

In this division of the subject emphasis is laid upon the applied side. Problems involving areas, lengths, surfaces, and volumes are treated by processes of single integration. The idea of successive and partial integration is applied to areas, moments, centers of gravity, surfaces, volumes, etc. The types of differential equations which the student of engineering is most likely to meet with in his subsequent work are briefly discussed. Text: Love's *Differential and Integral Calculus.*

119. CALCULUS. Sophomore year and elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Analytical Geometry. Professors Remick and White.

This course is designed especially for students intending to teach secondary mathematics and for those interested in the natural sciences. It includes a brief treatment of the fundamental principles of both branches of calculus, practice with the standard formulas of differentiation and their application to geometry and mechanics. Integration of the usual elementary forms is followed by the idea of the definite integral and a few of the more important applications.

122. SPECIAL METHODS IN THE TEACHING OF MATHEMATICS. Elective, second semester. Class work, three hours. Three semester credits. Associate Professor Stratton.

As its name indicates, this course is intended primarily for those who are planning to teach elementary mathematics. Emphasis is given to pedagogical questions, with some reference to the historical course of development. A discussion of the best methods of teaching arithmetic, algebra, and geometry; a study of the report of prominent mathematical organizations, especially those of the international commission; a comparison of the curricula of different schools—these are some of the matters which receive attention. An examination is made of books and articles on the teaching of mathematics. The course proceeds by lectures, readings, and reports on assigned topics.

125. ANALYSIS OF STATISTICS. Elective, first semester. Class work, three hours. Three semester credits. Professor Remick and Associate Professor Stratton.

The special purpose of this course is to acquaint students of agriculture, who may have occasion to make use of statistical tables of various sorts, with the modern mathematical methods of treatment. Use is made of farm bulletins, agricultural reports, etc., by means of lectures, readings, and recitations.

131. INSTITUTIONAL ACCOUNTING. Elective, second semester. Class work, three hours. Three semester credits. Associate Professor Stratton.

This course treats of accounting for institutions such as colleges, schools, clubs, societies, industrial and social organizations. The practice work includes preparation for publication of statements of income and expenditure, balance sheets, treasurer's reports, financial data and statistics, and of the annual returns of net income required under the federal income-tax law. A study is made of the mathematics of investments, the handling of endowment and trust funds, and the preparation of budgets. The work proceeds by lectures, discussions, written reports, and exercises.

137. ACCOUNTING. Freshman year, first semester. Class work, three hours. Three semester credits. Associate Professor Stratton.

An introduction to accounting adapted for students who have had little or no bookkeeping. The fundamental principles of bookkeeping are presented along with practice sets which emphasize the structure and significance of the

accounts which make up the balance sheet and statement of profit and loss. Text: McKinsey's *Bookkeeping and Accounting,* Vol. I.

140. ACCOUNTING PRACTICE I. Freshman year, first semester. Class work, three hours. Three semester credits. Prerequisite: Accounting or one year of high-school bookkeeping. Associate Professor Stratton.

This course includes an analysis of the development and structure of accounting methods and is designed to give students power to analyze commercial accounts and statements. Controlling accounts, departmental revenue accounts, accounts with accruals and deferred items, and special accounts of single proprietors, partnerships, and corporations are studied in connection with brief practice sets to illustrate their uses in actual business. Text: McKinsey's *Bookkeeping and Accounting,* Vol. II.

143. ACCOUNTING PRACTICE II. Freshman year, second semester. Class work, three hours. Three semester credits. Associate Professor Stratton.

The construction and interpretation of particular accounts peculiar to corporations, the theory of depreciation, the disposition of profits, and the analysis of bank statements and railroad reports are the chief topics considered. Text: Cole's *Fundamentals of Accounting.*

FOR GRADUATES AND UNDERGRADUATES

The following courses are available on request by a sufficient number of students. Numbers 201, 210, and 213 are offered each year.

201. DIFFERENTIAL EQUATIONS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Calculus II. Professor Remick.

This course is designed for those who may wish to extend their study of mathematics beyond the usual first course in calculus, and also for those intending to take advanced work in physics, mechanics, or engineering. The various standard types of differential equations are considered, together with the usual applications. Text: Murray's *Differential Equations.*

204. METHOD OF LEAST SQUARES AND THEORY OF MEASUREMENT. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Calculus II. Professors Remick and White.

This course includes a study of the law of error based on the theory of probability and the probability curve; adjustments of observations by the method of least squares; development of precision measures; distribution of errors; and Gauss's method of substitution in the solution of normal equations. The solution of a number of problems is required.

207. SOLID ANALYTICAL GEOMETRY. Elective, second semester. Class work, three hours. Three semester credits. Prerequisites: Plane Analytical Geometry, and Calculus II. Professor White.

The topics treated include coördinates of points in space and their transformations, and involve the usual discussion of lines and planes. The standard types of quadratic surfaces are considered together with their classification and principal properties. Text: Snyder and Sisam's *Analytical Geometry of Space.*

210. ADVANCED CALCULUS I. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Calculus II. Professor White.

This course considers primarily special topics in integral calculus, including various methods of integrating elementary forms, a discussion of definite integrals with attention to the gamma and beta functions, and applications to lengths and areas. Text: Byerly's *Integral Calculus.*

213. ADVANCED CALCULUS II. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Advanced Calculus I. Professor White.

This is a continuation of course 210, including further applications to geometry and mechanics, a treatment of line, surface, and space integrals, and a discussion of elliptic integrals. Text: Byerly's *Integral Calculus.*

216. THEORY OF EQUATIONS. Elective, first semester. Class work, three hours. Three semester credits. Professor Remick.

The course presupposes familiarity with the elements of the classical theory of the subject and treats particularly the modern development based upon the ideas connected with substitution groups and leading to the discussion of the solution of the general algebraic equation from the standpoint of the Galois theory. Text: Cajori's *Modern Theory of Equations.*

FOR GRADUATES

The following courses are available by appointment:

301. THEORY OF FUNCTIONS OF A COMPLEX VARIABLE. Elective, second semester. Class work, three hours. Three semester credits. Prerequisites: Advanced Calculus II and Differential Equations. Professor Remick.

The usual line of topics is treated through lectures, discussions, and reports.

306. THEORETICAL MECHANICS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Calculus II. Associate Professor Stratton.

It is assumed that the student entering upon this course is familiar with certain preliminary ideas found in textbooks on general physics, and the subject of mechanics is treated in its relation to mathematical analysis.

311. PROJECTIVE GEOMETRY. Elective, second semester. Class work, three hours. Three semester credits. Professor White.

This course includes a treatment of the fundamental forms, projective relations, point rows, and pencils of the second order, poles and polars, properties of conics, and involution.

316. ADVANCED DIFFERENTIAL EQUATIONS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Differential Equations. Professor Remick.

This is a continuation of course 201. It includes a treatment of special topics, such as the equations of Legendre, Bessel, and Ricatti, together with applications.

321. LIE THEORY OF DIFFERENTIAL EQUATIONS. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Differential Equations. Professor Remick.

This course is an introduction to Lie's theory of one-parameter groups, with special reference to its application to the solution of the various types of differential equations.

Military Training

F. B. TERRELL (Major Inf., U. S. A.), Professor of Military Science and Tactics
C. A. CHAPMAN (Major C. A. C., U. S. A.), Associate Professor of Military Science and Tactics, in charge of Coast Artillery, R. O. T. C. Unit
L. C. DAVIDSON (Major Inf., U. S. A.), Associate Professor of Military Science and Tactics, Commandant of Cadets
DON R. NORRIS (Capt. C. A. C., U. S. A.), Assistant Professor of Military Science and Tactics
C. N. JACKSON (Capt. Inf., U. S. A.), Assistant Professor of Military Science and Tactics
G. W. BROWER (First Lieut. Vet. Corps, U. S. A.), in charge of R. O. T. C. Veterinary Unit.
JAMES V. COLE (First Lieut. Inf., U. S. A.), Assistant Professor of Military Science and Tactics
E. L. CLAEREN (Major, U. S. R.), Secretary
BERNARD MCCAREY (Master Sergt., U. S. A., Retired), Supply Sergeant
M. M. COFFEE (First Sergt. C. A. C., U. S. A.), Instructor
FRANK CUMISKEY (Staff Sergt., U. S. A.), Instructor
S. A. WILSON (Sergt. Inf., U. S. A.), Instructor
MATTHEW J. CONNOLLY (Sergt. Inf., U. S. A.), Instructor
ROY E. WILSON (Private, First Class, C. A. C., U. S. A.), Mechanic.

Since this College is one of the beneficiaries of the act of congress of 1862, military tactics is required in the College curricula. All young men of age, not physically disqualified, are required to take military training four full

hours a week for two years. A student entering as a junior or above is held for military science for the time necessary to complete the remainder of his College course unless this period is reduced by credits accepted from another institution.

Requests for excuse from military science, or for postponement of the work, are acted upon by the president of the College. Such requests are presented through the student's dean, and the president obtains the advice of the commandant of cadets, who thoroughly investigates each case on its merits and makes his recommendation to the president. Requests based on physical condition must be accompanied by a recommendation made by the College physician. Students excused from military science on account of physical disability are assigned to an equivalent amount of some other College work instead. Students permitted to postpone military science for any reason are not thereby excused, but must make it up later.

The act of congress of June 3, 1916, known as the national defense act, provides for the establishment in civil institutions of a Reserve Officers' Training Corps (R. O. T. C.).

The object of this provision is stated as follows:

"The primary object of establishing units of the Reserve Officers' Training Corps is to qualify, by systematic and standard methods of training, students at civil institutions for reserve officers. The system of instruction, herein prescribed, presents to these students a standard measure of that military training which is necessary in order to prepare them to perform intelligently the duties of commissioned officers in the military forces of the United States, and it enables them to be thus trained with the least practicable interference with their civil careers.

"Units of the senior division may be organized at civil institutions which require four years of collegiate study for a degree, including state universities and those state institutions that are required to provide instruction in military tactics under the provisions of the act of congress approved July 2, 1862, donating lands for the establishment of colleges where the leading object shall be practical instruction in agriculture and the mechanic arts, including military tactics.

"Units of the junior division may be organized at any other public or private educational institution."

An infantry unit, a coast artillery unit, and a veterinary unit of the Reserve Officers' Training Corps have been established in this College, the senior division consisting of men in the four years' College curricula and the Vocational School.

Members of the R. O. T. C. will receive the benefits mentioned below:

1. SENIOR DIVISION, BASIC COURSE (Freshmen, Sophomores, and Vocational School). Each student of these classes will be furnished with complete uniform, and equipment for his use during the course. The articles remain the property of the United States and must be accounted for and turned in by each student at the close of each college year.

A fee of 25c per semester is charged all students assigned to military training.

A six weeks' training camp is optional for this course.

2. SENIOR DIVISION, ADVANCED COURSE (students who have completed the two years' Basic Course). The student who continues in the R. O. T. C. after completing the Basic Course will receive the following benefits:

He will receive the uniform referred to above, on the same terms.

He will receive commutation of subsistence at the rate of 53 cents per day, provided he executes an agreement to complete the Advanced Course, or continue in the course during the remainder of his time in College, and to take the course in camp training during such period, prescribed by the Secretary of War. The camps referred to involve no expense on the part of the student. In addition, a complete summer uniform will be issued and he will

be paid at the rate of one dollar per day for not to exceed six weeks, and five cents per mile to cover travel expenses.

After graduation he will be eligible for appointment by the President of the United States as a reserve officer of the army, and if so appointed he may, under certain conditions, be appointed and commissioned as a temporary second lieutenant in the regular army for a period of six months, with pay at the rate of $100 per month, with the usual allowances.

In order to elect the Advanced Course, R. O. T. C., a student must have the recommendation of the president of the College, his dean, and the professor of military science and tactics.

The corps of cadets at present is organized as two battalions of infantry, four companies. A military band is also provided for, the members of which must be thoroughly trained in military tactics. Assignments to the military band are made upon recommendation of the bandmaster, who has charge of the technical instruction.

Officers and noncommissioned officers are selected from the students taking the Advanced Course, R. O. T. C., by the commandant of cadets, with the approval of the president of the College. This selection is made from among those cadets who have been most studious and soldierlike in the performance of their duties, and the most exemplary in their general deportment. Commissions are given all officers, and these commissions are signed by the governor, the secretary of state and the adjutant-general of the Kansas National Guard, while warrants signed by the president of the College and the commandant of cadets are issued to the noncommissioned officers. Both are held during the good conduct of the recipient.

Students who are regularly enrolled in the Advanced Course of the Senior Division receive three semester credits of elective work toward graduation for each semester of military training taken beyond the Basic Course.

Members of the R. O. T. C. will be given two semester credits for attendance at the R. O. T. C. Summer Training Camps at Fort Snelling, Minnesota (Infantry Unit), Fort Monroe, Virginia (Coast Artillery Unit), and Carlisle Medical School (Veterinary Unit). No student will be given credit for attendance at more than one summer training camp during his four years' course.

COURSES IN MILITARY TRAINING

Senior Division, R. O. T. C.

BASIC COURSES, INFANTRY

101. INFANTRY I. Freshman year, first semester. Lectures, recitations, and military drill, four hours a week. One semester credit. Prerequisite: None. Captain Jackson.

The work of this course is divided as follows:

(*a*) *Practical.* Physical training, infantry drill, bayonet training, preliminary marksmanship.

(*b*) *Theoretical.* Recitation: Infantry drill regulations, theory of rifle marksmanship.

102. INFANTRY II. Freshman year, second semester. Lectures, recitations, and military drill, four hours a week. One semester credit. Prerequisite: Infantry I. Captain Jackson.

The course includes a study of infantry drill regulations, rifle marksmanship, personal combat, scouting and patrolling, signaling, and is divided as follows:

(*a*) *Practical.* Infantry drill, rifle range practice, bayonet and personal combat, scouting and patrolling, and signaling.

(*b*) *Theoretical.* Rifle marksmanship, lectures on scouting and patrolling, military courtesy and customs.

103. INFANTRY III. Sophomore year, first semester. Lectures, recitations, and military drill, four hours. One semester credit. Prerequisites: Infantry I and II. Major Davidson.

The course includes a study of infantry drill, review (as instructors), map reading, military sketching, and musketry, and is divided as follows:

(*a*) *Practical* Acting as instructors of freshmen in infantry, drill, sketching and plane-table surveying, musketry problems.

(*b*) *Theoretical.* Sketching and map reading (panoramic and plane), musketry, fire discipline, fire control, fire direction.

104. INFANTRY IV. Sophomore year, second semester. Lectures, recitations, and military drill, four hours. One semester credit. Prerequisite: Infantry III. Major Davidson.

The work of this course includes study of infantry drill and maneuvers, musketry (continued), infantry weapons, command and leadership, hygiene and sanitation. It embraces:

(*a*) *Practical.* Infantry platoon problems in musketry, infantry weapons, demonstration of their uses and mechanisms, hygiene and sanitary inspections, practice in command and leadership.

(*b*) *Theoretical.* Study of infantry weapons, modern hygiene and sanitary methods, diseases, etc.

SIX WEEKS SUMMER TRAINING CAMP. Optional. Two semester credits.

ADVANCED COURSES, INFANTRY

109. INFANTRY V. Junior year, first semester. Lectures, recitations, and military drill, five hours. Three semester credits. Prerequisites: Infantry I, II, III, and IV. Major Terrell, First Lieutenant Cole.

This course embraces a study of field engineering, accompanying infantry weapons, machine gun, 37-mm. gun, and light mortar, and is divided as follows:

(*a*) *Practical.* Leadership and instruction in all basic course subjects.

(*b*) *Theoretical.* Study and recitation, field engineering, mechanism and use of accompanying weapons.

110. INFANTRY VI. Junior year, second semester. Lectures, recitations, and military drill, five hours. Three semester credits. Prerequisite: Infantry V. Major Terrell, First Lieutenant Cole.

The course comprises a study of military history, administration, organization, command and leadership, and is divided as follows:

(*a*) *Practical.* Same as in course 109 (Infantry V).

(*b*) *Theoretical.* Accompanying weapons (continued), law (military and civil), rules of land warfare.

111. INFANTRY VII. Senior year, first semester. Lectures, recitations, and military drill, five hours. Three semester credits. Prerequisite: Infantry VI. Major Terrell, First Lieutenant Cole.

This course comprises a study of military history, administration, organization, command and leadership, and is divided as follows:

(*a*) *Practical.* Command and leadership, basic course.

(*b*) *Theoretical.* Study and recitation, military history, administration and organization.

112. INFANTRY VIII. Senior year, second semester. Lectures, recitations, and military drill, five hours. Three semester credits. Prerequisite: Infantry VII. Major Terrell, First Lieutenant Cole.

The course embraces study of minor tactics, pistol marksmanship, commands and leadership. It is divided as follows:

(*a*) *Practical.* Command and leadership, basic course subjects, tactical problems, pistol range problems.

(*b*) *Theoretical.* Military tactics, practical problems, mechanism and nomenclature, automatic pistol (caliber .45).

BASIC COURSES, COAST ARTILLERY

(For students of the Division of Engineering only)

113. ARTILLERY I. Freshman year, first semester. Lectures, recitations, and practical instruction, four hours. One semester credit. Prerequisites: None. Captain Norris.

The work of this course is the same as for course 101 (Infantry I).

114. ARTILLERY II. Freshman year, second semester. Lectures, recitations, and practical instruction, four hours. One semester credit. Prerequisite: Artillery I or Infantry I. Captain Norris.

The work of this course is the same as for course 102 (Infantry II).

115. ARTILLERY III. Sophomore year, first semester. Lectures, recitations, and practical instruction, four hours. One semester credit. Prerequisite: Artillery II or Infantry II. Captain Norris.

The work of this course is divided as follows:

(*a*) *Practical.* Infantry instruction, artillery material, motor transportation.

(*b*) *Theoretical.* Infantry drill regulations, artillery material, motor transportation.

116. ARTILLERY IV. Sophomore year, second semester. Lectures, recitations, and practical instruction, four hours. One semester credit. Prerequisite: Artillery III. Captain Norris.

The work of this course is divided as follows:

(*a*) *Practical.* Section (*a*) of course 115 continued.

(*b*) *Theoretical.* Section (*b*) of course 115 continued.

THE BASIC CAMP. This is held annually for about six weeks in the summer at Fort Winfield Scott, San Francisco, Cal.

ADVANCED COURSES, COAST ARTILLERY

(For students of the Division of Engineering only)

117. ARTILLERY V. Junior year, first semester. Lectures, recitations, and practical instruction, five hours. Three semester credits. Prerequisite: Artillery IV. Major Chapman.

The course is divided into—

(*a*) *Practical.* Duties as cadet officers and noncommissioned officers in connection with courses 113, 114, 115, and 116; field engineering, artillery material, orientation, motor transportation.

(*b*) *Theoretical.* Gunnery, military law, and orientation.

118. ARTILLERY VI. Junior year, second semester. Lectures, recitations, and practical instruction, five hours. Three semester credits. Prerequisite: Artillery V. Major Chapman.

This course is divided into—

(*a*) *Practical.* Section (*a*) of course 117 continued.

(*b*) *Theoretical.* Section (*b*) of course 117 continued, administration, military hygiene, military policy.

119. ARTILLERY VII. Senior year, first semester. Lectures, recitations, and military drill, five hours. Three semester credits. Prerequisite: Artillery VI. Major Chapman.

The course is divided into—

(*a*) *Practical.* Duties as cadet officers and noncommissioned officers; artillery material, orientation, field engineering.

(*b*) *Theoretical.* Administration, gunnery, employment of artillery.

120. ARTILLERY VIII. Senior year, second semester. Lectures, recitations, and military drill, five hours. Three semester credits. Prerequisite: Artillery VII. Major Chapman.

This course is divided into—

(*a*) *Practical.* Section (*a*) of course 119; gunnery.

(*b*) *Theoretical.* Military law, gunnery, the employment of artillery, military policy.

NOTE.—Advanced-course students are required to attend one camp. This comes normally at the end of the junior year and is held at the same place as mentioned above for the basic camp.

BASIC COURSES, VETERINARY CORPS

(For students in the Division of Veterinary Medicine only)

121. MILITARY SCIENCE (VET.) I. Freshman year, first semester. Lectures, recitations, and military drill, four hours. One semester credit. Prerequisites: None. Lieutenant Brower.

The work of this course is divided as follows:

(*a*) *Practical.* Same as course 101 (Infantry I).

(*b*) *Theoretical.* Organization and administration, military art.

122. MILITARY SCIENCE (VET.) II. Freshman year, second semester. Lectures, recitations, and military drill, four hours. One semester credit. Prerequisite: Course 121. Lieutenant Brower.

The work of this course is divided as follows:

(*a*) *Practical.* Same as course 102 (Infantry II).

(*b*) *Theoretical.* Organization and administration, sanitation, logistics, first aid.

123. MILITARY SCIENCE (VET.) III. Sophomore year, first semester. Lectures, recitations, and military drill, four hours. One semester credit. Prerequisite: Military Science (Vet.) II. Lieutenant Brower.

The work of this course is divided as follows:

(*a*) *Practical.* Same as section (*a*) of course 102; duties of privates and noncommissioned officers of the veterinary corps demonstrated.

(*b*) *Theoretical.* Tactics, logistics.

124. MILITARY SCIENCE (VET.) IV. Sophomore year, second semester. Lectures, recitations, and military drill, four hours. One semester credit. Prerequisite: Course 123. Lieutenant Brower.

The work of this course is divided as follows:

(*a*) *Practical.* Same as courses 102 (Infantry II) and 123.

(*b*) *Theoretical.* Organization and administration; sanitation; military art, logistics, first aid.

ADVANCED COURSES, VETERINARY CORPS

(For students of the Division of Veterinary Medicine only)

129. MILITARY SCIENCE (VET.) V. Junior year, first semester. Lectures and recitations, three hours. Three semester credits. Prerequisite: Course 124. Lieutenant Brower.

This course is divided into—

(*a*) *Practical.* Duties of junior officers demonstrated.

(*b*) *Theoretical.* Organization and administration, sanitation, and logistics.

130. MILITARY SCIENCE (VET.) VI. Junior year, second semester. Lectures and recitations, three hours. Three semester credits. Prerequisite: Course 129. Lieutenant Brower.

This course is divided into—

(*a*) *Practical.* Continuation of section (*a*), course 129.

(*b*) *Theoretical.* Sanitation.

131. MILITARY SCIENCE (VET.) VII. Senior year, first semester. Lectures and recitations, three hours. Three semester credits. Prerequisite: Course 130. Lieutenant Brower.

This course is divided into—

(*a*) *Practical.* Continuation of section (*a*), course 129.

(*b*) *Theoretical.* Organization and administration, sanitation.

132. MILITARY SCIENCE (VET.) VIII. Senior year, second semester. Lectures and recitations, three hours. Three semester credits. Prerequisite: Course 131.

This course is divided into—

(*a*) *Practical.* Continuation of section (*a*), course 129.

(*b*) *Theoretical.* Organization and administration (continued), résumé of entire course.

Modern Languages

Professor CORTELYOU
Associate Professor LIMPER
Instructor HESSE

The study of modern foreign languages serves a number of purposes. It gives the student general training and culture; it throws helpful side lights upon English, his mother tongue; and it gives him important aid in scientific research. It is desired that the instruction in modern languages here given be as practical as possible, without, however, failing to encourage an appreciation of modern foreign literature. The plan of instruction in general is a combination of the grammatical and conversational methods, each of which has its own special advantages.

A number of literary and scientific periodicals published in French, Spanish, and German are received by the College Library, and afford the student excellent opportunity to amplify his reading knowledge of these languages.

Students who have had French, Spanish, or German in high school are required, as a rule, to take more advanced courses as their elective or required work in that language.

COURSES IN GERMAN

FOR UNDERGRADUATES

101. GERMAN I. Junior year and elective, first semester. Class work, three hours. Three semester credits. No prerequisite. Professor Cortelyou.

In the work of this course there are included the study of articles, declensions of nouns and pronouns, the indicative mode of weak verbs, sentence order, and the comparison of adjectives. Frequent reviews enable the student to digest the facts presented, while the abundant conversation and written work subserves the same end. Text: Vos's *Essentials of German* (first eighteen lessons).

102. GERMAN II. Junior year and elective, second semester. Class work, three hours. Three semester credits. Prerequisites: German I, or its equivalent. Professor Cortelyou.

Students are repeatedly drilled on the grammatical constructions already emphasized in German I, of which this course is a continuation. The remaining important grammar points are studied. Essential facts of grammar are insisted upon, but German in taught as a living language. Written translations from English into German are frequent. Text: Vos's *Essentials of German* (completed).

111. GERMAN READINGS. Senior year and elective, both semesters. Class work, three hours. Three semester credits. Prerequisite: German II, or its equivalent. Professor Cortelyou.

This course embraces readings of easy, idiomatic selections from modern authors. Grammatical drill is continued. German conversations based on the texts read are frequent. Text: *Aehrenlese,* by Bierwirth and Herrick.

FOR GRADUATES AND UNDERGRADUATES

201. GERMAN SHORT STORIES. Elective, both semesters. Class work, three hours. Three semester credits. Prerequisite: German Readings. Offered in the year 1921-'22 and alternate years thereafter. Professor Cortelyou.

The material read in this course comprises a number of short stories of considerable interest, by such modern authors as Auerbach, Niese, Goldhammer, La Roche, Leander, Scheffel, and Polenz. Text: Baker's *German Stories.*

206. GERMAN COMEDIES. Elective, both semesters. Class work, three hours. Three semester credits. Prerequisite: German Readings. Offered in the year 1920-'21 and alternate years thereafter. Professor Cortelyou.

The course comprises the reading of recent one-act comedies of literary merit, and of a realistic, lively, and cleanly humorous nature, including the following: Julius Rosen's *Ein Knopf,* Gustav von Moser's *Ein amerikanisches Duell,* Hugo Mueller's *Im Wartesalon erster Klasse,* and Emil Pohl's *Die Schulreiterin.* Exercises in conversation and sight reading are occasionally introduced. Text: Manley and Allen's *Four German Comedies.*

221. GERMAN PROSE I. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Course 201 or 206. Not offered in the year 1921-'22. Professor Cortelyou.

This is a practical course designed to give the student an intimate knowledge of everyday German as used among the Germans in their various activities. There are occasional sight translations and some conversational work is done. Text: Kron's *German Daily Life.*

226. GERMAN CLASSICS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Course 216, 221, or 231. Not offered in the year 1921-'22. Professor Cortelyou.

This is a course introductory to a study of the German classics. Two or three of the simpler works of classic authors, such as Lessing's *Minna von Barnhelm* and Goethe's *Hermann und Dorothea,* are translated in the work of this term. Textbooks. Lessing's *Minna von Barnhelm,* edited by von Minckwitz and Wilder, and Goethe's *Hermann und Dorothea,* edited by Allen.

231. GERMAN PROSE II. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Course 201 or 206. Not offered in the year 1921-'22. Professor Cortelyou.

This course is designed to give the student facility in the rapid translation of fairly easy prose. A number of modern short stories are read. Besides the more formal work, there are sight translations of easy selections. Text: Allen and Batt's *Easy German Stories,* Vols. I and II.

237. SCIENTIFIC GERMAN I. Senior year and elective, both semesters. Class work, four hours. Four semester credits. Prerequisite: Course 102. Professor Cortelyou.

This course is designed as an introduction to the vast field of scientific publications appearing in German. It consists chiefly in translating miscellaneous scientific articles, especially those dealing with chemistry and physics. Text: Dippold's *Scientific German Reader.*

241. SCIENTIFIC GERMAN II. Elective, second semester. By appointment. Class work, three hours. Three semester credits. Prerequisite: Course 237. Professor Cortelyou.

In this course the reading done deals with the special field of science in which the student's main interest lies. The selection of the text to be used will depend upon circumstances.

COURSES IN FRENCH

FOR UNDERGRADUATES

151. FRENCH I. Freshman and sophomore years and elective, both semesters and summer school. Class work, three hours. Three semester credits. Associate Professor Limper and Miss Hesse.

The first two class periods are devoted to learning the phonetic symbols and a number of useful French expressions. Conversation is used merely as a means to the acquisition of a reading knowledge of French. The fundamentals of grammar are covered in this and the succeeding course. Text: Lamb's *Inductive French Grammar*, complete edition (first twenty-five lessons).

152. FRENCH II. Freshman and sophomore years and elective, both semesters and summer school. Class work, three hours. Three semester credits. Prerequisite: French I, or one year of high-school French. Associate Professor Limper and Miss Hesse.

This course is a continuation of French I. The grammar is completed, special attention being given to irregular verbs. Reading and conversation are continued throughout the course. Students who have had one year of French in high school begin with this course. Text: Lamb's *Inductive French Grammar* (completed).

161. FRENCH READINGS. Elective, first semester and summer school. Class work, three hours. Three semester credits. Not to be taken by students who have had course 154. Prerequisite: French II. Associate Professor Limper and Miss Hesse.

This is essentially a reading course, the purpose being to enlarge the student's vocabulary. Grammar is reviewed and considerable time is devoted to conversation. Text: Monvert's *La Belle France.*

FOR GRADUATES AND UNDERGRADUATES

251. FRENCH SHORT STORIES. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: French Readings. Associate Professor Limper and Miss Hesse.

The purpose of this course is to introduce the student to modern French literature. The modern short story, since it covers so large a range of subjects, also offers excellent material for the enlargement of the vocabulary. Stories by such writers as Daudet, Maupassant, and Zola are read. Text: Buffum's *French Short Stories.*

270. TEACHERS' COURSE IN FRENCH. Elective, second semester and summer school. Class work, three hours. Three semester credits. Prerequisite: Consult the instructor. Associate Professor Limper.

The subject matter of this course includes the following: The anatomical basis for the production of the sounds peculiar to the French language; methods of presenting grammar, with a thorough and systematic review of the subject; a careful examination of the various French reading texts used in the state; and methods of conducting a *Cercle français*, and material to be used in it.

COURSES IN SPANISH

FOR UNDERGRADUATES

176. SPANISH I. Elective, both semesters and summer school. Class work, three hours. Three semester credits. Miss Hesse.

In this course nouns, adjectives, pronouns, demonstratives, and numerals are treated and the indicative mode of verbs is studied. The course is largely conducted in Spanish, the student gradually acquiring a fair-sized and practical vocabulary. Text: Hills and Ford's *First Spanish Course* (first thirty-one lessons).

177. SPANISH II. Elective, both semesters. Class work, three hours. Three semester credits. Prerequisite: Spanish I, or one year of high-school Spanish. Miss Hesse.

In addition to study of grammar, which is here completed, considerable reading is done. Stress is laid upon training the ear to understand spoken Spanish. Texts: Hills and Ford's *First Spanish Course* (completed), and Bergé-Soler and Hatheway's *Elementary Spanish-American Reader.*

180. SPANISH READINGS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Spanish II. Miss Hesse.

A thorough study is made of one or two of the best works in Spanish literature from the more modern writers. One hour a week is devoted entirely to conversation and composition, the subjects being taken from current topics of the day. Text: Mármol's *Amalia,* edited by Corley.

183. COMMERCIAL SPANISH. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Spanish II. Miss Hesse.

This course is intended to equip the student with a commercial vocabulary and with the elements indispensable to success, especially necessary if he should pursue his business in Latin-American countries. Text: McHale's *Commercial Spanish.*

Music

Professor PRATT
Associate Professor WHEELER
Assistant Professor SMITH
Assistant Professor GORDON
Assistant Professor RINGO
Assistant Professor KIMMEL
Assistant Professor HANNEN
Assistant Professor LINDQUIST
Instructor WARREN
Instructor KELLER
Instructor HASSINGER
Instructor COLBURN
Instructor FORISTALL
Instructor ELLIS
Instructor GRUBER
Miss ROBINSON

The aim of the Department of Music is, to be of vital value in the life of every student. The department strives to create and foster a love and appreciation for the best in music and to give to students that broader culture and more complete education which is gained through academic and professional and vocational training combined with musical and artistic study. Believing that this can be accomplished to a much greater degree by having artistic performers among us, courses are offered which will prepare those who so desire to be efficient in some chosen musical line. Students enrolled in the department participate in the musical contributions to the public programs of the College, and such participation is a part of their training and duty.

METHODS OF INSTRUCTION

Instruction in voice and instrumental music is given in private lessons. No two students have the same mental, physical or artistic capacity, and their individual capabilities can be neither properly nor fully developed without painstaking personal attention. The best results are dependent on a close adaptation to the individual needs of the pupils, and this, of course, cannot be gained in classes, as is the case in the individual lessons. The effectiveness of the methods used is demonstrated by the interest and progress of the pupils.

All theoretical work is taught in classes. These and some other classes in the Department of Music are free to any student in the institution.

CREDITS

Students taking work in the Department of Music to a sufficient extent are allowed credits on their electives in the Divisions of General Science, Home Economics, and Agriculture, while substitutions in music, with the approval of the dean, may be made in the Division of Engineering, as follows: For Voice or some instrument, two hours each semester; for Musical History, two hours each semester; for Harmony, two hours each semester; for Counterpoint, Musical Form and Musical Analysis, two hours each semester; for Chorus, Orchestra or Band, one hour each semester; for Public-school Music Methods, two hours each semester. Any student having a full assignment may, upon recommendation of the director of music together with the approval of the student's dean, take music without credit.

Students coming from other schools to enter our courses in music may be

sufficiently advanced as players or singers to enter the second or third year of the regular music curricula but prohibited therefrom owing to their lack of knowledge of theory. If such students enter the first year of the theoretical course, their progress as players and singers is not retarded, but it would be much to their advantage to make special theoretical preparation in the hope of qualifying for more advanced standing.

Applicants for freshman standing in the four-year music curricula must pass an examination over certain required work. Examinations also will be held at the close of each year before advanced standing is allowed. A list of this examination material may be had by writing the director of the Department of Music.

PRELIMINARY PIANO TRAINING.

Preliminary training in piano is undertaken by two classes of students. The first class consists of College students not able to meet the College entrance requirements in piano, and of high-school students. The second consists of children; they take one hour of class work each week, supplementing private lessons.

Special training is given in rhythm, sight reading, scale building, melody writing, ear training, and appreciation. This work aims to develop in the student a natural means of expression through music and to furnish the right foundation for a musical education.

THEORETICAL COURSES IN MUSIC

The aim of theoretical courses is to give the student an intelligent conception of music through the study of its historical development and scientific constructions in either composition or interpretation.

FOR UNDERGRADUATES

101, 102. HARMONY I AND II. Freshman year, first and second semesters, respectively. Class work, two hours. Two semester credits for each. Prerequisite: Knowledge of fundamentals of musical notation. Assistant Professor Gordon.

This course includes the study of scales, intervals, primary and secondary triads and their inversions; harmonizing given basses and melodies; chords of the dominant seventh; secondary seventh chords, modulation; original work begun, and keyboard harmony.

103, 104. HARMONY III AND IV. Sophomore year, first and second semesters, respectively. Class work, two hours. Two semester credits for each course. Prerequisite: Harmony II. Assistant Professor Gordon.

This course includes the study of: modulation (continued); altered chords, embellishments, pedal point, accompaniments, and original work in the use of all the material in courses 101, 102, 103 and 104.

105, 106. EAR TRAINING AND SIGHT SINGING I AND II. Freshman year, first and second semesters, respectively. Class work, two hours. Two semester credits in the music curricula; no credit elsewhere. Prerequisite: Same as for Harmony I. Assistant Professor Hannen.

This course is a study in the reading and hearing of intervals, chords, and rhythmical forms.

107. COUNTERPOINT. Junior year, first semester. Class work, two hours. Two semester credits. Prerequisite: Harmony IV. Assistant Professor Gordon.

The course in counterpoint consists of the study of simple counterpoint in two parts; first, second, third, fourth and fifth species, and florid counterpoint.

109. MUSICAL FORM AND ANALYSIS. Junior year, second semester. Class work, two hours. Two semester credits. Prerequisites: Harmony IV and Counterpoint. Assistant Professor Gordon.

Chord reading and the accounting theoretically for every note in a piece of music, combined with analytical study of hymn tunes, preludes, inventions, and dance forms of Bach, small instrumental forms, song forms, sonata forms, cantata and oratorio forms are the substances of this course.

110, 111. HISTORY OF MUSIC I AND II. Sophomore year, first and second semesters, respectively. Students may enter at the beginning of either semester, however. Class work, two hours. Two semester credits for each course. Professor Pratt.

A modern text forming the basis of this work is supplemented by lectures and library research. Time is given to the early and primitive development of the art, but special stress is laid upon the classical, Roman and modern periods, together with the present-day conditions and tendencies. In addition to theses upon the general historical and critical subjects, the class is also given practice in journalistic criticism of concert and recital performances.

115, 116. MUSICAL APPRECIATION I AND II. Freshman year, first and second semesters, respectively. Class work, one hour. No credit. Required of students in music curricula. Professor Pratt.

The appreciation of all things in life comes through familiarity with them. For the majority of people familiarity with good music must come entirely through hearing it. This course is presented in a nontechnical way, with extensive use of gramophone records, player piano and personal illustrations by faculty members, with the sole design of facilitating intelligent listening and greater appreciation of the beauties of music.

117. CONDUCTING. Junior year, first semester, music curricula, and second year, second semester, public-school music curriculum. Class work, one hour. One semester credit. Associate Professor Wheeler.

Practical training is given in the essentials of good conducting. This includes the correct method of indicating all forms of rhythm, the seating arrangements of bands, orchestras, and choruses, and a practical illustration of the use of this information in the various ensemble organizations of the College. The value of such a course can be readily appreciated by anyone who has tried to do conducting.

A fee of $10 is charged for this work.

118. VOCAL COMPOSITION. Elective, second semester. Class work, one hour; six hours of preparation. Two semester credits. Prerequisites: Harmony I, II, III and IV. Professor Pratt.

Rhythm and tone color in poetry are studied comprehensively. Original musical settings are written for the different poetic forms. Vocal solos, duets, trios and quartets are composed, both with and without piano accompaniment.

119. INSTRUMENTAL COMPOSITION. Elective, second semester. Class work, one hour; six hours of preparation. Two semester credits. Prerequisites: Harmony I, II, III, and IV, and Counterpoint. Assistant Professor Gordon.

This is an advanced study in composition. Music is written for all instruments, both in solo and ensemble.

120, 121. SCHOOL MUSIC METHODS I AND II. First year, first and second semesters, respectively. Lectures and research, two hours. Two semester credits for each course. Prerequisite: An understanding of musical notation and of the piano keyboard. Assistant Professor Hannen.

These courses are given for the training of teachers of music in the public schools. They meet the requirements of the state of Kansas for such training.

122, 123. SCHOOL MUSIC METHODS III AND IV. Second year, first and second semesters, respectively. Lectures, research, and private teaching, two hours. Two semester credits for each course. Assistant Professor Hannen.

These courses are a continuation of School Music Methods I and II.

130. INSTRUMENTATION. Senior year, first semester. Class work, two hours. Two semester credits. Prerequisites: Harmony I and II. Associate Professor Wheeler.

All the instruments of the band and orchestra are studied with relation to their characters, ranges and functions. Simple and familiar compositions are scored for small ensemble, viz., string trio, quartet, quintet, and for wind quartet and sextet.

133. ORCHESTRATION. Senior year, second semester. Class work, two hours. Two semester credits. Prerequisites: Harmony I, II, III, and IV, and Counterpoint. Associate Professor Wheeler.

The writing of music for the orchestra and the band is studied. Analytic and synthetic study is made of music scores.

140. NORMAL PIANO METHODS. Junior year, first semester. Class work, two hours. Two semester credits. Assistant Professor Smith.

Teaching material for the piano is studied and presented, and there is frequent observation of lessons given in the preliminary piano classes.

PRACTICAL COURSES IN MUSIC

FOR UNDERGRADUATES

155. MUSICAL FUNDAMENTALS. Elective, both semesters. Class work, one hour. One semester credit. Professor Pratt.

This course is presented to meet the needs of many students who come to us each year with a desire for some training in music, but with no knowledge of music notation and without sufficient time or money to devote to a regular musical instruction course. The work consists largely of class singing, the study of note values, rhythm, scales, intervals, key signatures, etc., and the application of this knowledge to the singing of part songs.

A fee of $5 is charged for this work, and at least ten students must enroll or the class cannot be organized.

160A to 160H. VOICE I TO VIII. Two private lessons each week; twelve hours of preparation. Four semester credits for each course. Professor Pratt, Assistant Professor Lindquist, Assistant Professor Kimmel, Mr. Gruber, and Miss Ellis.

The instruction in these courses is based primarily on the Garcia method of voice training, adapted to meet the needs of English-speaking pupils. The production of tone in singing is controlled by certain fundamental, explainable laws of phonetics, and breath control. Teaching the intelligent use of these laws is the constant object in these courses. Coaching is given in the singing of French, Italian, and German songs, but the greater part of the work is in English, and pure enunciation of our language is stressed constantly. Teachers are provided for all grades of students from the very beginning to those preparing for professional work.

161A to 161D. VOICE A-I TO A-IV. First and second years, public-school music curriculum, and elective. Two private lessons each week; six hours of preparation. Two semester credits. Professor Pratt, Assistant Professors Lindquist and Kimmel, Mr. Gruber, and Miss Ellis.

The instruction in this course follows the same plan as that pursued in courses 160A to 160H, but less preparation is required.

165A to 165H. VIOLIN I TO VIII. Two private lessons each week. For freshmen and sophomores, twelve hours of preparation; four semester credits for each course. For juniors and seniors, twenty-four hours of preparation; six semester credits for each course. Assistant Professor Hannen, Miss Hassinger.

In this course the aim is to teach the fundamentals of violin playing in such a manner as to lay the foundation of intelligent musicianship. Mastery of the instrument is a task that imposes different difficulties upon each student, and no definite method of instruction can be outlined which can be pursued profitably by all players. However, a graceful and natural method

of playing is insisted upon and great care is exercised to develop an accurate feeling for good intonation. Studies and exercises from the best writers are selected, and as the student develops the entire field of violin literature is open for study.

Violoncello, viola and contrabass receive the same attention in these courses as does the violin.

166. VIOLIN A. Elective in College curricula. Two private lessons each week; six hours of preparation. Two semester credits. Assistant Professor Hannen, Miss Hassinger.

Instruction in this course is much the same as in Violin I to VIII, but less preparation is required to meet the needs of students taking this course as an elective.

168A, 168B. VIOLIN ENSEMBLE I AND II. Junior year, first and second semesters, respectively. Class work, two hours. Two semester credits. Prerequisites: Freshman and sophomore violin, viola, violoncello, or contrabass, or the equivalent. Assistant Professor Hannen.

This is a practical course in the playing of string duets, trios, quartets, and other ensemble compositions.

170A to 170H. PIANO I TO VIII. All four years. Two private lessons each week; twenty-four hours of preparation. Six semester credits. Assistant Professors Smith and Ringo, Misses Warren, Keller, Foristall, and Colburn.

The methods pursued in these courses are direct and simple and are based on scientific principles. The purpose of piano instruction is to make music lovers of its students, and for those who plan to make music their profession to give a sound technical foundation, to cultivate a thinking musicianship, to acquaint students with a generous amount of the best music literature, to develop capable teachers and good amateur performers, and thus to furnish the foundation upon which the superstructure of the artist may be built. The piano instruction as outlined for each year is a conservative estimate of what a student of average talent is expected to accomplish. In the piano ensemble classes, where the purpose is to develop sight reading and concerted playing, the student has an opportunity to become acquainted with some of the best orchestral works arranged for this purpose.

172A to 172D. PIANO A-I TO A-IV. Freshman and sophomore years and elective. Two private lessons each week; six hours of preparation. Two semester credits. Assistant Professors Smith and Ringo, Misses Warren, Keller, Foristall, and Colburn.

Instruction is much the same as in Piano I to VIII, but less preparation is required and less credit is given.

174A to 174D. PIANO B-I TO B-IV. First year, first semester, to second year, second semester, public-school music curriculum. One private lesson each week; six hours of preparation. One semester credit for each course. Assistant Professors Smith and Ringo, Misses Warren, Keller, Foristall and Colburn.

Instruction follows the same plan as in Piano I to VIII, but less preparation is required than in those courses.

176A to 176H. PIANO ENSEMBLE I TO VIII. Required throughout the piano curriculum. One hour each week. No credit. Assistant Professor Smith and Assistant Professor Ringo.

During the first and second years classes of four students each are formed for practice in ensemble sight reading. During the third and fourth years the work is done partly in classes of four, but develops into two-piano work, training for accompanying, and ensemble with various groups of orchestra instruments. Every two weeks a playing class is held, at which students in the piano curriculum play frequently. This class is open to all piano students for performance and attendance.

180A to 180H. ENSEMBLE I TO VIII. One course each semester throughout the music curricula. Class work, one hour. One semester credit for each course. Professor Pratt and Associate Professor Wheeler.

The required ensemble work may be taken in Choral Society (courses 190A to 190H), Orchestra (courses 193A to 193H), or College Band (courses 196A to 196H). For further information concerning this work, see these courses.

182. WIND INSTRUMENTS. Elective, both semesters. Two private lessons each week; six hours of preparation. Two semester credits. Associate Professor Wheeler.

In this course opportunity is offered for the study of any wind instrument. Both the Albert and the Boehm systems of clarinet playing are used. The instruction begins with elementary scale and technical study and extends over the more difficult literature written for wind instruments. Instruction in instrumentation, conducting and formation of bands is also given.

184A to 184F. RECITAL I TO VI. Sophomore, junior, and senior years. Courses I, II, III, and V carry one semester credit each; courses IV and VI carry two semester credits each.

These courses are required of each student in each of the three four-year music curricula. In the second semester of the junior and senior years (courses IV and VI) the student gives an entire solo recital.

186A to 186D. REPERTOIRE I, II, III, AND IV. Junior and senior years, voice curriculum. Class work, two hours. Two semester credits. Professor Pratt.

These courses present an exhaustive study of vocal literature of all periods. Songs are prepared out of class and presented in class for criticism. Classes in this course are limited to a maximum membership of eight.

188. PRACTICE TEACHING OF MUSIC. Junior year, second semester. Class work, two hours. Two semester credits. Professor Pratt and Assistant Professor Smith.

Students in the piano, violin, and voice curricula are required to do practice teaching in private classes during the second semester of the junior year.

MUSICAL ORGANIZATIONS

The existence of an organization of individuals is justified by the service such a body renders. The musical organizations of this College are second to none in the colleges of America. Students are here given a rare opportunity to study the great musical compositions that have been written for various ensemble combinations, and to render very real service to the College and community as well as to themselves in the presentation of public programs.

190A to 190H. CHORAL SOCIETY I TO VIII. This group of courses covers four years. Weekly rehearsals, all special rehearsals and public performances. One semester credit for each course. Prerequisite: Ability to read musical notation and to sing in tune. Professor Pratt.

The Choral Society numbers over two hundred and is one of the best student singing organizations in the Middle West. In connection with the local singers of Manhattan, "The Messiah" is presented every year before the Christmas vacation, and some other great oratorio is presented during the Spring Festival of Music.

THE MEN'S GLEE CLUB. The Men's Glee Club is composed of about thirty of the best men's voices in the College. Membership is open to the best voices that try out from the whole College. This organization is available for a limited number of concert engagements throughout the state. Professor Pratt directs.

THE WOMEN'S GLEE CLUB. This is an organization of the young women of the College. The voices are selected in the same manner as are those of the Men's Glee Club. These two clubs are unexcelled in the Middle West and

are combined for choir singing at the College. Assistant Professor Lindquist directs the Women's Glee Club.

193A to 193H. ORCHESTRA I TO VIII. This group of courses covers all four years of the curriculum. Regular rehearsals, all special rehearsals and public performances. One semester credit for each course. Associate Professor Wheeler.

The College Orchestra is a definite organization in which discipline prevails and permanent membership with regular attendance is insisted upon. This body maintains a correct and well-balanced instrumentation, containing all the instruments of the modern symphony orchestra. The work is highly educational, and offers in the preparation of concerts and performances with the Choral Society the actual experience and routine necessary for efficient orchestra playing. Membership is open to all in the College who are capable of playing acceptably.

196A to 196H. BAND I TO VIII. This group of courses covers all four years of the curriculum. Regular rehearsals, all special rehearsals and public performances. One semester credit for each course. Associate Professor Wheeler.

Practice in the College Band may be accredited through the Department of Military Science in lieu of drill and theoretical instruction. The band furnishes music for all ceremonies of a military character and for various other College occasions.

Physical Education and Athletics

Professor AHEARN
Associate Professor BACHMAN
Assistant Professor KNOTH
Assistant Professor CURTISS
Assistant Professor TAUSCHE
Assistant WORRALL

The purpose of the Department of Physical Education and Athletics is to assist the students of the College to live to the best advantage, and so to aid them in the formation of hygienic habits that during their College course they may make profitable physical preparation for life. It is an urgent necessity that each student have an intelligent appreciation of the means requisite for the preservation of his health, in order that he may be able to formulate intelligently his own policy of health control.

All young men and all young women of the College are entitled to the privileges of the gymnasium, which is one of the largest in the West and is well equipped with all sorts of apparatus for physical training, with lockers, plunge baths, shower baths, and other accommodations.

PHYSICAL EDUCATION FOR MEN

Physical education is required of all freshmen and sophomores unless excused for disability by the College physician. After the requirement is completed, advanced work may be elected for a total of four hours of credit.

PHYSICAL EXAMINATIONS

The work of the department is based largely upon a physical examination given each student when he enters upon the work of the department. A second examination is given at the close of his first year. All students, whether taking work in the department or not, are entitled to receive a physical examination and advice as to their physical condition.

The measurements taken and the tests given have each a definite purpose with reference to ascertaining the muscular condition of the individual. A diagnosis is also made of the vital organs to ascertain their functional conditions, and a complete inspection of the whole body is made to detect any weakness or deformity that may exist. Based upon the information thus obtained, advice is given and work is assigned to students in accordance with

their physical needs, tastes, and capabilities. Delicate students and those suffering from functional disorders receive individual attention. Students organically sound are assigned work in a carefully graded and progressive system of gymnastics and athletics. All candidates for athletic teams should enroll in the department, submit to a thorough physical examination, and pass the grade tests before being allowed to compete for positions on the various teams. Students engaging in two or more sports during the school year must undergo a physical examination preliminary to participation in each sport. This is required in order that no student may engage in athletics to his own permanent physical injury. Each student may secure a copy of his physical measurements, and an anthropometric chart, showing in graphic form his development as compared with that of the average man.

Members of the teams, reporting regularly, are excused from regular class work, and are entitled to full credit in that portion of their work; but before the completion of the course at least two semesters' work must be done in the gymnasium. Credit, the equivalent of a one-hour subject, is given and counts toward the College degree. The individual's grade rests largely on the basis of attendance, punctuality, earnestness, and application, but practical tests are also given.

Regulation uniforms must be worn in the gymnasium. Students are advised not to procure uniforms until after their arrival at the College.

Various grades of gymnastic and athletic exercises are offered by the department. The great variety of exercises offered is intended to meet all individual needs, capacities and tastes. A physical examination and test determines the grade or class of exercises for which a student is fitted.

COURSES IN PHYSICAL EDUCATION

103. PHYSICAL EDUCATION M-I. Freshman year, first semester. Two hours a week. Assistant Professor Knoth.

Hygiene and social problems are discussed as an essential part of this course. This instruction gives an insight into the practical problems of daily healthy living from a personal point of view. Directions are given for avoiding the common ills of student life, and for maintaining the highest physical and mental condition while in College, as well as for gaining the highest development of vital power and health for future duties.

During the winter the practical work is conducted indoors, and consists of light and heavy gymnastics, which are selected with a view to obtaining progressive effect upon the bodily organism. During the fall a man may select Rugby football or soccer football. Beginning about December first the work consists of the following:

a. *Free Calisthenics.* Exercises are selected for their different effects upon the bodily organism, and are arranged in the order of increasing difficulty. They involve hygienic or body-building work, educative movement, and corrective or remedial exercises. Both the Swedish and the German systems are used.

b. *Light Apparatus.* Training is given in the use of Indian clubs, dumbbells, wands, bar bells, etc.

c. *Heavy Apparatus.* Graded exercises are given on parallel bars, vaulting bars, bounce board and mat, side and long horse, high and low horizontal bars, traveling and flying rings, etc.

d. *Indoor Athletics.* Instruction is given in all indoor track events preparatory to indoor track meets.

e. *Games.* There are included basket ball, indoor baseball, volley ball; also other games of more recreative nature.

104. PHYSICAL EDUCATION M-II. Freshman year, second semester. Two hours a week. Assistant Professor Knoth.

This course is a continuation of Physical Training M-I. Baseball, track and field athletics are given in the spring as soon as weather conditions permit

outdoor work. A part of the regular instruction for the spring semester is in swimming. A passing grade must be made in this phase of the work also.

105. PHYSICAL EDUCATION M-III. Sophomore year, first semester. Two hours a week. Assistant Professor Knoth.

This course is a continuation of Physical Education M-II. It is required of all young men of the sophomore class.

106. PHYSICAL EDUCATION M-IV. Sophomore year, second semester. Two hours a week. Assistant Professor Knoth.

This course is a continuation of Physical Education M-III. It is required of all young men of the sophomore class.

110. ADVANCED APPARATUS I. Elective, first semester. Three hours a week. One semester credit. Assistant Professor Knoth.

This course is open only to those men who show ability as gymnasts. From this class men are picked for the gymnastic team. Tumbling and work on the various pieces of apparatus are given.

111. ADVANCED APPARATUS II. Elective, second semester. Three hours a week. One semester credit. Assistant Professor Knoth.

This is a continuation of Advanced Apparatus I.

120. PHYSICAL TRAINING SPECIALTIES. Under this head come fencing, boxing, wrestling, offered as advanced work to those who have had not less than two semesters of work in the gymnasium. Hours are arranged with the instructor.

126. FOOTBALL. Elective, second semester and summer school. Lectures and recitations, two hours. Two semester credits. Associate Professor Bachman.

This course covers the following phases: Spirit of the game, discussion of the rules, tackling the dummy, charging sled, defense in general, line defense, secondary defense, kick-off, punting, place kicking, drop kicking, direct pass plays, systems of offense in general, quarter-back pass plays, interference, signals, training, and equipment.

130. BASKET BALL. Elective, first semester and summer school. Lectures and recitations, one hour. One semester credit. Assistant Professor Curtiss.

The work covers a discussion of the rules, technic of basket shooting, foul throwing, catching and passing, dribbling, reverse turn, different styles of play, offense, defense, team work, selection of players, training and equipment.

135. BASEBALL. Elective, second semester and summer school. Lectures and recitations, one hour. One semester credit. Assistant Professor Curtiss.

This course includes discussion of the rules, fielding, batting, bunting, base running, sliding, team work, pitching, catching, proper way to play each position, indoor and outdoor practice methods, coaching, signals, training and equipment.

140. TRACK AND FIELD SPORTS. Elective, first semester and summer school. Lectures and recitations, one hour. One semester credit. Assistant Professor Curtiss.

This course covers discussion of the rules, starting, sprinting, distance running, hurdling, jumping, vaulting, shot putting, discus throwing, javelin throwing, training, dieting, and equipment.

142. THEORY OF PHYSICAL EDUCATION AND PLAYGROUND MANAGEMENT. Elective, summer school. Lectures and recitations, two hours. One semester credit. Assistant Professor Knoth.

The theory of the systems of physical education is studied. The philosophy of play, and the organization and equipment of the playground are considered

144. CALISTHENICS AND GAMES. Elective, summer school. Lectures and recitations, six hours. Three semester credits. Assistant Professor Knoth.

In this course the following topics are studied: Calisthenics with and without hand apparatus, including gymnastic marching tactics; personal proficiency in execution and exactness of form; progression and value of system in these exercises; use of wands, clubs, dumb-bells, etc.; practice teaching; plays and games to meet the requirements of children of all ages; simple teams, group and competitive teams.

146. Administration and Organization in Physical Education. Elective, summer school. Lectures and recitations, two hours. One semester credit. Assistant Professor Knoth.

Problems in administration and organization of work in physical education are taken up. Intercollegiate, intramural, and mass athletics are studied. Sportsmanship and ethics are considered.

ATHLETICS

Departmental Athletics. In the fall and in the spring the courses in the gymnasium are partly supplemented by instruction in outdoor athletics. Individuals are assigned to the kind of work best suited to them. Attendance is compulsory upon those participating. In the fall the following sports are offered: football; track and field events; cross-country running; and outdoor basket ball. In the spring are offered: baseball; track and field events; cross-country running; and outdoor basket ball.

Cross-country running is encouraged throughout the year. Natural exercise in the open air takes precedence of all other forms of exercise. Opportunity is offered for tennis, but it cannot be elected in place of required work.

Days unsuited for outdoor work are devoted to a discussion of playing rules, the principles of training for athletic contests, and lectures on team work.

Intramural Athletics. All athletics within the institution, including the Vocational School teams, come directly under the supervision of the Department of Physical Education. It is the aim of the department to furnish an opportunity for all students to participate in some form of healthful athletic competition. To carry out the above aim, class football is maintained during the fall among the different classes of the College, also among the different classes of the Vocational School. Basket ball also is promoted during the fall and early part of the winter among the different fraternities, different classes, and different cadet companies, as well as among the students of the different departments of the College.

The work of the spring is largely given over to competition in baseball among the different classes, both in the College and Vocational School, the different departments of the institution and boarding-house teams. It is the aim of the department, too, to revive an interest in track athletics among the different classes of the institution. All these activities as promoted will be run, as nearly as possible, on a tournament plan, making it possible for a large majority of the students to participate in some form of activity. Suitable trophies will be presented and suitable emblems will be granted to participants on winning teams.

In addition to interclass competition there will be a small outside schedule for the Vocational School in the different forms of athletics promoted by the department.

By action of the Student Council, approved by the Faculty, the following rules govern class athletic contests:

1. Managers of class teams are required to play only men who hold assignments to the class with which they play.
2. The requirements for participation in class games are the same as for varsity teams.
3. The respective managers of class athletics are required to present a certified list of eligible players to each other at each game.
4. No man who has been a member of the varsity squad during a given season shall participate in a class game during that season.

5. No man shall participate in a class game who has won a K in that sport.

INTERCOLLEGIATE ATHLETICS. These contests are promoted and encouraged for the more vigorous students, because of their effect upon College life and their wide social and moral value to the participants. Intercollegiate teams should represent the final stage of selection in an educational process and development among a large number of students, thereby giving both a rational physical-education system and a healthful system of sport. Intercollegiate contests are scheduled for football, basket ball, track athletics, and tennis. The College is a member of the Missouri Valley Conference and competes with the best teams in the Middle West.

Intercollegiate athletics are placed under the supervision of the Athletic Board by an order of the Board of Administration. This Athletic Board consists of the president of the College, four other members of the Faculty appointed by the Board of Administration, and one member from each College class, elected by the respective classes.

Participation in intercollegiate athletic contests is fixed by the following Missouri Valley Conference rules:

1. No student is eligible who receives pay from his institution as a regular instructor.
2. No student is eligible who receives pay for his services as player or manager of his team.
3. No student who has received pay for his athletic skill or knowledge is eligible to participate in any intercollegiate contest (except for summer baseball prior to 1912).
4. No student shall participate in contests as a member of an athletic team except on his home baseball team. No student shall play under an assumed name.
5. No student shall participate in intercollegiate sport for more than three years.
6. No graduate student shall participate in any intercollegiate contest.
7. No student shall participate in intercollegiate contests who has not been in attendance one full year prior to the date of contests, who has not passed in his entrance requirements, who has not passed in at least 30 semester hours' work during the year previous to the contest, and who is not maintaining passing grades in 12 credit hours during the current semester.
8. No person who, having participated in any intercollegiate contest, fails to remain in College the remainder of that semester, unless excused by his dean for sickness, or other sufficient reason, shall participate again until he shall have completed six months of work following his last participation.

PHYSICAL EDUCATION FOR WOMEN

All young women in the College are required to take two years of physical education unless excused by the dean of women.

After the two years' required physical education have been completed, women have the privilege of electing physical education for a total of four credit hours; such elective work must be approved by their dean. Athletic Association points are awarded for elective work.

PHYSICAL EXAMINATIONS

A physical examination of each young woman is made by the instructor in charge of women before permission to enter a class is given. This includes a system of body measurements, strength tests, and examination of the condition of the heart and lungs. Physical defects, abnormalities and weaknesses are noted, and special exercises are provided for the student needing the individual corrective work.

A suit has been adopted which consists of an all-white middy blouse, black tie, and black, plaited bloomers. White tennis shoes with white rubber soles are used. For swimming, girls must have the regulation one-piece tank suit made from brown cotton covert, according to a pattern approved by the De-

partment of Physical Education, or a one-piece gray knit suit. Girls should not buy their swimming suits before arriving in Manhattan. For further information address Women's Department of Physical Education, K. S. A. C., Manhattan, Kan.

COURSES IN PHYSICAL EDUCATION

151A. PHYSICAL EDUCATION W-I. Freshman year, first semester. Lectures and gymnasium, three hours. One semester credit. Dean Van Zile, Assistant Professor Tausche.

Instruction in hygiene and social problems is an essential part of this course. In these lectures, in addition to the problems of hygiene as applied to individual health, the biological truths that lead to serious, respectful consideration of social and sex hygiene are presented. This part of the course is given by the dean of women.

The physical training part of this course is divided into two hours a week of regular gymnasium work and one hour of interpretative dancing, folk dancing, games, tennis, hockey, basket ball, or swimming. Classes are in part held out of doors when the weather permits.

152A. PHYSICAL EDUCATION W-II. Freshman year, second semester. Gymnasium, three hours. One semester credit. Prerequisite: Physical Education W-I. Assistant Professor Tausche, and Miss Worrall.

In this course the marching tactics, floor work, etc., are continued for two hours a week, and basket ball, games, interpretative dancing, folk dancing, tennis, and swimming are carried on for one hour a week.

153, 154. PHYSICAL EDUCATION W-III AND W-IV. Sophomore year, first and second semesters, respectively. Gymnasium, three hours. One semester credit. Assistant Professor Tausche, and Miss Worrall.

The work in these two courses is a continuation of that of courses 151A and 152A. More advanced work in marching tactics and apparatus is here given.

175. GYMNASTICS. Elective, summer school. Lectures and recitations, one and one-half hours; practical work, three hours. One semester credit. Assistant Professor Tausche.

This course is especially planned for the needs of the teacher in the public schools where no special teacher in this subject is employed. Lectures are given on the general theory of gymnastics and the physiological reason for each exercise. A notebook is required.

Practical Work.—The practical work includes free exercises, hand apparatus, heavy apparatus, and practice teaching.

177. CORRECTIVE GYMNASTICS. Practical work, three hours. One semester credit. Assistant Professor Tausche.

This course is intended for those who have physical defects, abnormalities, and other weaknesses. Special exercises are given to students needing individual corrective work.

178. FOLK DANCING. Elective, summer school. Lectures and recitations, one hour; practical work, four hours. One semester credit. Assistant Professor Tausche.

Lectures are given on the physiological benefit derived from the dances, in costuming, and in the use of the dances in festivals and fêtes. A notebook is required.

Practical Work.—This course offers graded folk dances of the different nations, suitable for use in schoolrooms, playgrounds, or gymnasiums.

181. GAMES. Elective, summer school. Lectures and recitations, one hour; practical work, four hours. One semester credit. Assistant Professor Tausche.

Lectures are given on the problems of grading games, and on the physiological benefits received. A notebook is required.

Practical Work.—This course offers practice in games for grammar schools, high schools, playgrounds and gymnasiums.

182. PLAYGROUND MANAGEMENT. Elective, summer school. Lectures and recitations, one hour; practical work, to be arranged. One semester credit. Assistant Professor Tausche.

This course includes discussions of the organization and administration of playground activities and equipment, and practical experience in conducting such activities.

185. INTERPRETATIVE DANCING. Elective, summer school. Class work and practical work, five hours. One semester credit. Assistant Professor Tausche.

This course aims to teach dancing, not dances, through logical, conscious control of body movements, motivated by music which has been studied and is understood. This study of music includes the simple, common rhythms, which are easily adapted to many uses.

187. TECHNIC OF BASKET BALL, BASEBALL, AND HOCKEY. Elective, summer school. Lectures and recitations, three hours. One semester credit. Assistant Professor Tausche.

This course is devoted to the technic of these sports, the physiological benefit derived, and the organization of each into interclass contests.

190. SWIMMING W. Open to all women students of the College. Both semesters. No credit. Assistant Professor Tausche.

This is a course in swimming in which individual instruction is given in several styles of swimming and diving.

Physics

Professor HAMILTON
Professor RABURN
Professor FLOYD
Assistant Professor CONVERSE
Assistant Professor BRACKETT
Assistant Professor HARTEL
Assistant Professor COOK
Instructor TAYLOR
Instructor LYON

Recognizing the need of a thorough knowledge of the fundamental laws and principles involved in all physical changes, provision has been made, in the courses which follow, for both a theoretical and a practical treatment of the subject. Instruction is based upon the facts given in selected textbooks, and these topics are enlarged upon by lectures and illustrated by experimental demonstrations. The purpose is to give a training in exact reasoning, and a knowledge of principles that will be factors in the solution of problems in all branches of science as well as in everyday life.

The laboratory work which accompanies the courses in physics gives a student abundant opportunity to test the principal laws of the science; and, since he is expected to arrange and operate the apparatus, the work should enable him to acquire skill in manipulation, precision of judgment, and care in the use of delicate instruments. The laboratories are well arranged for the work, and the equipment provided is of a nature adapted to meet the requirement of accurate work in all courses. The manual in use in most of the courses is one prepared by the department to meet the exact conditions and equipment of the laboratory.

COURSES IN PHYSICS

FOR UNDERGRADUATES

101. HOUSEHOLD PHYSICS. Freshman year, both semesters. Class work, three hours; laboratory, three hours. Four semester credits. Prerequisite: One year of high-school physics or its equivalent. Professor Hamilton, Professor Floyd.

This course consists of lectures and demonstrations, in which the laws

relating to principles involved in appliances of the household are explained and illustrated. The work in heat is based upon thermometry, calorimetry, radiation, absorption, and methods of refrigeration and ventilation. The course includes a study of light, with its color phenomena and actinic effects; of some of the optical instruments used in scientific work; a study of electric lighting, and illumination, and of cost of operating many of the appliances used in the home, including suggestions for the proper use and care of electrical apparatus for the protection of the appliances and of the operator.

120. PHOTOGRAPHY. Elective, both semesters. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Training in physics and chemistry. Professor Hamilton.

The importance of a record of exact details, as shown in a photograph, makes this work valuable to all scientists. The course gives the student some knowledge of the chemical and physical principles involved in the art, as well as practice in making good negatives and prints. The lecture and laboratory work deals with: Things to be considered in selecting a camera; proper exposures; composition of pictures; proper development of plates; tests of different developers; retouching; reducing and intensifying negatives; printing and mounting; making lantern slides, bromide enlargement, and the prints best adapted for illustrated articles in newspapers and magazines.

130. WIRELESS TELEGRAPHY. Elective, both semesters. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Elementary Physics. Mr. Lyon.

The work includes a study of the most efficient types of receiving and transmission sets, a study of the fundamental principles of electric waves, and of the most important points to be observed in the erection of a good plant.

Laboratory.—The student learns in the laboratory to receive and to transmit messages, and as he learns the code he is instructed in field work.

133. METEOROLOGY. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Physics. Professor Hamilton or Assistant Professor Converse.

This course is designed to give an understanding of weather phenomena and of the underlying principles of weather forecasting. A special study is made of the factors that fix the climate of Kansas and of the United States. Applications of weather to agriculture and the teaching of general science and physiography are emphasized. In order to give the student practice in the use of weather apparatus and in handling meteorological data, laboratory exercises are included in the required work. Text: Milham's *Meteorology.*

135. GENERAL PHYSICS I. Sophomore year, first semester. Class work, three hours; laboratory, three hours. Four semester credits. Prerequisites: Elementary Physics and Plane Trigonometry. Professor Raburn, Professor Floyd.

This course, like the one following, is provided for those intending to specialize in scientific lines. It covers, in as thorough a manner as possible, the general principles involved in mechanics, sound, and heat. Text: Ferry's *General Physics.*

Laboratory.—The work is based upon laws and principles discussed in the classroom, and is so arranged that the students may have a practical illustration of the facts learned. Assistant Professors Brackett and Cook, Mr. Lyon.

140. GENERAL PHYSICS II. Sophomore year, second semester. Class work, three hours; laboratory, three hours. Four semester credits. Prerequisite: General Physics I. Professor Raburn, Professor Floyd.

This course includes a study of the theory of electricity and light. The class follows the subject as outlined in the text, but special emphasis is placed upon those parts that have an immediate bearing on the work of other sciences, such as electrolysis, thermal effects, relation of electrical and mechanical energy. Text: Ferry's *General Physics.*

Laboratory.—The work follows the subjects presented in the class and is conducted with a grade of apparatus that gives training in the use of the better class of instruments employed in scientific investigations.

145. ENGINEERING PHYSICS I. Sophomore year, both semesters. Class work, four hours; laboratory, three hours. Five semester credits. Prerequisites: Elementary Physics and Plane Trigonometry. Professor Hamilton, Professor Raburn, Assistant Professor Brackett.

This course in mechanics, sound and heat is intended to give the engineering students as thorough a working knowledge as possible of the fundamental units and laws involved in force, work, power, and energy; also the laws of simple machines, gases, and liquids as they occur in the transformation of force and energy. Text: Anderson's *Engineering for Technical Students.*

Laboratory.—The work consists of the use of apparatus to test the laws of inertia, moments of force, moments of torsion, elasticity, and rigidity, and other laws and principles involved in mechanics and heat. Accurate measurements and carefully recorded data are required. Assistant Professors Brackett and Cook, Mr. Lyon.

150. ENGINEERING PHYSICS II. Sophomore year, both semesters. Class work, four hours; laboratory, three hours. Five semester credits. Prerequisite: Engineering Physics I. Professor Hamilton, Professor Raburn, Assistant Professor Brackett.

This course treats of electricity and light. The work in electricity is of such a nature as to give the student working knowledge of the units employed, and of the fundamental laws; and to acquaint him with methods of producing a current, its uses, and the system by which electrical energy is measured. The principal phenomena of light, together with the laws that may have direct bearing upon light as a standard and method of measurement, are treated in this course. Text: Anderson's *Engineering for Technical Students.*

Laboratory.—The electrical work in this course includes measurements of resistances, a study of primary cells, and the transformation of mechanical into electrical energy. The work of light consists of a study of the laws of reflection, and refraction, and measurements of wave lengths by means of the spectroscope, the use of the interferometer, and photometry.

FOR GRADUATES AND UNDERGRADUATES

203. LABORATORY TECHNIC. Elective, summer school. By appointment. Laboratory, twelve hours. Two semester credits. Professor Floyd.

This course includes saw filing and tool grinding; glass blowing, cutting, grinding, polishing, and cementing; metal filing, drilling, soldering and brazing; and making a set of punches, reamers, and cold chisels.

Students may, in certain cases, undertake problems chosen from the following at a cost covering the raw materials: Making a mercury-in-glass barometer; a seconds' pendulum; an accelerated motion machine; a fourteen-in-one laboratory tool; a Berthelot calorimeter; small induction coil; wireless apparatus; rheostats for power circuits; Langeub galvanometer; velocity of sound apparatus, photometer, etc.

213. ACOUSTICS. Elective, first semester. Class work, one hour. One semester credit. Prerequisite: Engineering Physics II. Professor Floyd, Assistant Professor Brackett.

In this course a special study is made of the acoustic properties of buildings, of the architectural defects which give rise to poor acoustics, with a study of special methods used to avoid such troubles in construction of buildings or to correct them in constructed buildings.

220. MOLECULAR PHYSICS AND HEAT. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: One year of College Physics. Professor Floyd or Professor Raburn.

The subject of molecular physics is presented and utilized as a basis of an explanation of such phenomena as depend upon the interaction of molecules and such as are fundamental in the presentation of the mechanical theory of heat. Lectures, collateral reading, and recitations from the text are used as a means of presentation. Text: Edser's *Heat.*

Laboratory.—The laboratory work is based on the fundamental principles presented in the classroom.

222. HARMONICS. Elective, second semester. Class work, two hours. Two semester credits. Prerequisites: One year each of music and elementary physics. Professor Hamilton, Professor Floyd.

This course is given to students of music so that they may learn the fundamental principles of sound that are associated with harmony. It is a lecture and demonstration course that deals with many facts of interest relating to the construction of scales and chords. A clearer understanding of composition and of tone quality may be had if the physical laws of sound are understood.

224. SPECIAL METHODS IN THE TEACHING OF PHYSICS. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. For credit towards the state teachers' certificate this must be taken in the student's senior year. Prerequisites: Educational Psychology and College Physics. Professor Floyd, Assistant Professor Converse.

This course is intended for those who are either teaching or expecting to teach physics in secondary schools. This class work includes an analysis of the present status of physics and of physics instruction in our high schools, and is based upon a critical study of the state text as well as other modern texts that may be used as reference. Special effort is made to vitalize the work and to make it apply to everyday life. Lectures, library work, demonstrations and practice teaching are used as methods of directing the course.

Laboratory.—The laboratory work includes the formation and adaptation of courses suitable for either rural or city high schools.

230. SPECTROSCOPY. Elective, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisites: College Physics and College Chemistry. Professor Raburn, Professor Floyd.

This is an advanced course in light, intended to cover the theory and use of the spectroscope and spectrometer as instruments for identifying elements or their compounds, when rendered incandescent, by means of their characteristic spectra or definite wave lengths.

Laboratory.—The laboratory work consists of calibration of prisms and gratings for ready use in chemical laboratories and also gives ample training in measuring wave lengths and in identifying the spectra of many substances.

231. OPTICS. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: One year of College Physics. Professor Hamilton or Professor Floyd.

This course is designed for those who may wish to extend and to intensify the first College course in light. Reflection, refraction, interference, diffraction, and polarization are treated by means of lectures, demonstrations, collateral readings, and recitations. Text: Wood's *Physical Optics.*

Laboratory.—The laboratory work is based on the fundamental principles presented in the theory part of the course.

233. RADIO-ACTIVITY AND ELECTRON THEORY. Elective, second semester. Class work, three hours. Three semester credits. Prerequisites: College Physics and College Chemistry. Professors Hamilton and Raburn.

The nature of the electron and its behavior in electric and magnetic fields, are studied. Temperature effects and behavior of the electron in cathode tubes using a hot cathode are discussed and studied in detail. The methods of determining the mass and velocity of electrons are developed from the historical standpoint. A study is made of the nature and effects of the various

rays, including x-rays and ultra-violet rays and the emanations from the known radioactive substances.

235. STORAGE BATTERIES. Elective, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisites: Physics and Chemistry. Professor Hamilton, Professor Floyd.

In the lecture-recitation part of this course, the following are studied: the history and development of the storage cell, lead and other types of cells, characteristics and behavior of cells on charge and discharge, care and operation of storage batteries, and renewal of sulphated cells. Text: Lyndon's *Storage Batteries.*

Laboratory.—The laboratory work comprises the testing of batteries for efficiency, the rebuilding of broken-down cells, and the rejuvenation of sulphated cells.

Public Speaking

Professor EMERSON*
Professor HILL†
Instructor R. E. HOLCOMBE‡
Instructor HELEN M. HOLCOMBE‡

It is the constant effort of the Department of Public Speaking to relate the training in public speaking with the work of all the other departments of the College; to harmonize it with the spirit of the College, which is distinctly technical and industrial. With this object in view, students are trained in the presentation and discussion of the valuable ideas acquired in their various fields of study. The method pursued in this training is that of actual practice on the platform before an audience. Conviction, not entertainment, is the dominant purpose in every case.

The department seeks to place itself at the service of those various organizations of the College which desire or need its assistance. In addition to its regular courses it aims to make itself available as far as possible for individual rehearsals; for the training of the orators of the College; and for the directing and coaching of plays. Students are urged to ally themselves with the organizations representing these various activities.

COURSES IN PUBLIC SPEAKING

FOR UNDERGRADUATES

101. PUBLIC SPEAKING I. Elective, both semesters. Class work, two hours. Two semester credits. Professor Hill and Mr. Holcombe.

The purpose of this course is to enable the student to attain some proficiency in the art of oral interpretation. The training given seeks to develop a natural style. In connection with the practice work upon the platform the student is given such points of theory and such routine drill as are necessary for the development and use of the voice and for proper platform deportment.

102. PUBLIC SPEAKING II. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Public Speaking I, or by arrangement with the head of the department. Professor Hill and Mr. Holcombe.

This course is a continuation of Public Speaking I, and involves a more advanced study of the art of oral interpretation.

106. EXTEMPORE SPEECH I. Freshman and junior years and elective, both semesters. Class work, two hours. Two semester credits. Professor Hill and Mr. Holcombe.

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* Absent on leave, 1921-'22.

† Acting head of the department, 1921-'22.

‡ Temporary appointment.

The work of this course consists in the preparation and delivery of short addresses based on prepared outlines. Careful preparation of material is required. The plan of the speech is made in advance, but the choice of language is left for the moment of speaking. Criticism and points of theory given by the instructor supplement the course.

108. EXTEMPORE SPEECH II. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Extempore Speech I, or its equivalent. Professor Hill and Mr. Holcombe.

This course is a continuation of Extempore Speech I. The same methods are pursued but special attention is given to the telling of humorous stories, to after-dinner speaking, and the like.

110. ADVANCED PUBLIC SPEAKING. Elective, second semester. One semester credit. Prerequisites: Extempore Speech I and II, or by special arrangement with the head of the department. Professor Hill and Mr. Holcombe.

In this course the work consists of the preparation and delivery by the student of one extended lecture-recital, lecture, or address during the semester. This is supplemented by class lectures and practice, and by a study of types. It may include the preparation and delivery of institute talks, or addresses suitable for extension work.

Zoology

Professor NABOURS
Professor ACKERT
Professor HARMAN
Assistant Professor HISAW
Instructor ROGERS
Instructor SPERRY
Instructor GUNNS
Instructor HUSE

The courses have been planned to give a fundamental knowledge of the structures, functions and relations of animals; information concerning the manner in which animals respond to the conditions of the environment; an appreciation of their human values; and a consideration of the problem of heredity and evolution.

General Zoölogy (course 105) constitutes a general survey, and forms an introduction to all lines in agriculture, general science, and home economics. Embryology and Physiology (108), Cytology (214), Advanced Embryology (220), Parasitology (124), Parasites and Public Health (218), Evolution and Heredity (217), Heredity and Eugenics (216), and Historical Geology (Geol. 201) are preliminary to advanced work in animal breeding, animal husbandry, dairy husbandry, veterinary medicine, home economics, and nursing. Selections may be made among these courses and Embryology (117), Ornithology (230), Comparative Morphology of Vertebrates (204), Animal Ecology (211), Zoölogical Problems (203), Research in Zoölogy (301), and the Seminars (225, 227), by those who expect to do advanced work in zoölogy or entomology, or become teachers of biology.

The classrooms and laboratories are equipped with charts, models, microscopes, microtomes, paraffin baths and other apparatus both for elementary and advanced work, and a good natural history museum is available. A specially trained technician is in charge of equipment and available in matters connected with zoölogical technic.

COURSES IN ZOOLOGY

FOR UNDERGRADUATES

105. GENERAL ZOÖLOGY. Sophomore year, both semesters. Class work, three hours; laboratory, six hours. Five semester credits. Professors Nabours, Ackert and Harman, Assistant Professor Hisaw, Mr. Rogers, Mr. Sperry, and Miss Huse.

The structures, functions, relations and evolution of types of both invertebrates and vertebrates are studied.

Laboratory. Studies are made of animals in nature and in the laboratory; inquiries are made into structures and functions by means of dissections and experiments.

108. EMBRYOLOGY AND PHYSIOLOGY. Sophomore year, both semesters. Class work, three hours; laboratory, six hours. Five semester credits. Prerequisites: Zoöl. 105 or equivalent, and Chem. 121. Professor Ackert, Professor Harman, and Miss Huse.

The first part of the course is devoted to embryology and the remaining part to human physiology. The course, depending upon the preceding work in zoölogy, falls into two closely related parts: (*a*) a study of the development of the germ cells, fertilization, origin of the germ layers, initiation and growth of organs and systems, establishment of fetal relations, and nutrition and growth with special reference to man; and (*b*) a study of the functions of the organs and systems of the human body, with special consideration of the degestive, respiratory, circulatory, nervous and urinogenital systems and organs of special sense.

Laboratory.—The laboratory work includes: (*a*) studies of the male and female germ cells, stages in the process of fertilization, the segmenting ovum, and whole mounts and serial sections of the chick and pig embryos in several stages of development, with demonstrations of types of mammalian fetal relations; and (*b*) experiments for the demonstration of the composition and functions of bone, blood, lymph, and the reaction of muscles, nerves, parts of the digestive, respiratory, excretory and other systems.

109. ZOÖLOGY AND EMBRYOLOGY (VET.). Freshman year, first semester. Class work, three hours; laboratory, six hours. Five semester credits. Professor Ackert and Assistant Professor Hisaw.

The first part of the semester is devoted to a general survey of the animal kingdom, with attention to classification, distribution, habitats and relations to each other and to man. The rest of the time is devoted to the consideration of the origin of the germ cells, fertilization, implantation, the development of membranes, and the nutrition of the fetus.

Laboratory.—Animals are observed in the field, vivaria and museum, and a comparative study is made of the organs and systems in a few selected types. Examination is made of germ cells, stages in fertilization and development of chick and pig embryos, and types of placentæ.

117. EMBRYOLOGY. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Zoöl. 105 or equivalent. Given in 1922-'23 and alternate years thereafter. Professor Harman and assistants.

The development of the germ cells, fertilization, origin of the germ layers, initiation and growth of systems of organs, establishment of fetal relations, and nutrition and growth in mammals are studied in this course.

Laboratory.—Studies of the male and female germ cells, stages in the processes of fertilization, the segmenting ovum, and whole mounts, serial sections, and reconstruction of the chick and pig embryos in several stages of growth, with demonstration of types of mammalian fetal relations, form the subject matter of the laboratory investigation.

124. PARASITOLOGY. Senior year, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Course 109. Professor Ackert.

A study is made of the biology, life histories and economic importance of the principal external and internal parasites of the domestic animals.

Laboratory.—The structural and functional adaptations of selected types of parasites are studied, and methods of diagnosis are utilized.

FOR GRADUATES AND UNDERGRADUATES

203. ZOÖLOGICAL PROBLEMS. Elective, both semesters. One or two semester credits. Professor Nabours, Professor Ackert, Professor Harman, and Assistant Professor Hisaw.

Individual problems in heredity, parasitology, cytology, embryology, and ecology are assigned by the instructors in charge.

204. COMPARATIVE MORPHOLOGY OF VERTEBRATES. Elective, second semester. Class work, three hours; laboratory, six hours. Five semester credits. Prerequisite: Zoöl. 105, or equivalent. Professor Ackert and Assistant Professor Hisaw.

The class work deals with vertebrate relations, comparative anatomy, physiology and evolution of organs and systems.

Laboratory.—The laboratory consists of studies of essential structures, using several types of vertebrates, and experiments in physiology.

206. ZOÖLOGICAL TECHNIC. Elective, first or second semester. Laboratory, three or six hours. One or two semester credits. Prerequisite: Zoöl. 105, or equivalent. Mr. Gunns.

The work consists of methods in killing, fixing, imbedding, using microtome, staining, dehydrating and other processes in the preparation of microscopical slides, principles of photomicrography, museum mounting and labeling, and introduction to taxidermy.

211. ANIMAL ECOLOGY. Elective, second semester. Lectures, one hour; laboratory and field work, six hours. Three semester credits. Prerequisites: Zoöl. 105, or equivalent. Assistant Professor Hisaw.

This course deals with the relation of animals to the complete environment. The associational method of study is used and the subject is considered from the descriptive, comparative and explanatory standpoints. Special attention is given to the dynamic factors of the environment and their effect on the present status and future changes of the animal community. The field work gives practice in the methods of field ecology and deals with the application of general principles to local conditions. The fundamental principles and other general aspects of the science are presented in the form of lectures.

214. CYTOLOGY. Elective, first semester. Lectures, two hours; laboratory, six hours. Four semester credits. Prerequisites: Zoöl. 108, or equivalent. Given in 1922-'23 and alternate years thereafter. Professor Harman.

Methods of preparing the material for microscopical study, the development of the germ cells and theories of structures and functions of the different parts of the cell are matters considered in this course. The work forms a basis for studies in heredity and related subjects.

216. HEREDITY AND EUGENICS. Elective, first semester. Lectures and recitations, two hours. Two semester credits. Professor Nabours.

This is a lecture and reading course dealing with human inheritance and the interactions of nurture and heredity.

217. EVOLUTION AND HEREDITY. Elective, second semester. Lectures, two hours; library reference reading and reports, three or six hours. Three or four semester credits. Prerequisites: Zoöl. 105 and Genetics (An. Husb. 221), or equivalent. Professor Nabours.

This is a lecture and reading course dealing with the development of the idea of evolution; the evidence and the principal theories of the causes; problems of variation, heredity, and experimental evolution.

218. PARASITES AND PUBLIC HEALTH. Elective, second semester. Lectures and demonstrations, three hours in class. Three semester credits. Prerequisites: Zoöl. 105, or equivalent. Professor Ackert.

This course deals with certain biological, pathological and prophylactic phases of the principal parasitic maladies, such as amebic dysentery, Texas fever, syphilis, sleeping sickness, dourine, nagana, and hookworm disease. Life histories and adaptation of protozoan parasites, and of tapeworms and round worms are considered.

220. ADVANCED EMBRYOLOGY. Elective, first semester. Lectures, two hours; laboratory, six hours. Four semester credits. Prerequisites: Zoöl. 105 and 108 or 109, or the equivalent. Given in 1923-'24, and alternate years. Professor Harman.

The course consists of further study of the main facts of embryology, with special reference to their bearing upon biological theories, the consideration of embryological problems, and a comparative study of the physiology of reproduction in mammals, including man.

225. ZOÖLOGY AND ENTOMOLOGY SEMINAR. Elective, both semesters. One semester credit.

This course consists in the presentation of original investigations, reviews of papers appearing in current journals, summaries of recent advances in the various fields, and discussions of the various aspects of the fundamental problems of modern biology.

227. GENETICS SEMINAR. Elective, both semesters. One semester credit. Professor Nabours, Professor Lippincott, Associate Professor Parker, and Assistant Professor Ibsen.

This course continues through the first and second semesters and includes the study and criticism of genetic experiments in plants and animals, the biological and mathematical methods employed, and validity of conclusions drawn.

230. ORNITHOLOGY. Elective, second semester. Class work, one hour; laboratory and field work, three hours. Two semester credits. Given in 1921-'22 and alternate years thereafter. Professor Ackert or Professor Harman.

Birds are studied with reference to classification, habits, habitats, adaptations and economic importance.

Laboratory.—The mounted birds and skins of the museum are used in the application of the principles of classification and adaptation. Field excursions are made for the purpose of identifying birds and studying their habits, habitats and migrations.

FOR GRADUATES

301. RESEARCH IN ZOÖLOGY. Elective, both semesters and during the summer. One to five semester credits. Prerequisites: Consult instructors. Professors Nabours, Ackert, and Harman, and Assistant Professor Hisaw.

Individual research problems in heredity and experimental evolution, parasitology, cytology, embryology, and ecology are assigned.

Special Courses for Teachers

At the present time teaching of vocational subjects in the public schools is undergoing great development. Many schools are introducing manual training, agriculture, food and nutrition and clothing and textiles, and many others are extending the work hitherto given. The state law requiring the teaching of agriculture in the rural schools is also creating a strong movement in the same direction. There is an active demand for teachers who can handle such work successfully.

The College offers to graduates of other institutions, and indeed to all who have studied such subjects as may be prerequisite, unexcelled facilities for securing training in the industrial subjects indicated. Courses extending over one or two years may be arranged by means of which the student who is already prepared in English, mathematics, and to a certain extent in the sciences, may prepare himself to enter a broader and, frequently, a more remunerative field.

Nos. 31, 32, 35, 36 and 37 of the groups of electives in the Division of General Science exhibit groupings that illustrate the possibilities in work of this character, and other arrangements may be made. Those taking such

courses will be cared for in the regular classes provided for other students, and no limitation is imposed except that the prerequisites for any subject must have been taken previously, here or elsewhere. These prerequisites are stated in this catalogue in connection with the description of each subject. The catalogue also shows the semester in which a subject is regularly given.

The conditions and requirements for the different classes of state certificates are stated in the introductory paragraphs for the Department of Education.

The course for persons who wish to prepare for teaching vocational agriculture under the Smith-Hughes law is outlined under the Division of Agriculture, and the course for those wishing to qualify as teachers of vocational home economics, under the same law, is given under the Division of Home Economics.

The Division of College Extension

HARRY UMBERGER, *Dean*
J. B. BENNETT, *In Charge of Information*

The people of Kansas believe in using their educational institutions to their full capacity, not only for the students privileged to come to them, but also for the state at large. They know that the number who complete a College course in agriculture, engineering, or home economics is small in comparison with the great majority of the people who cannot go to college, and it is their wish that this majority also be served. The Agricultural College is in full sympathy with this desire and is ambitious not only to give its resident students the best possible training for leadership in life's work, but to be of direct service to every community of the state.

As far back as 1864 conventions of the farmers of Manhattan and vicinity were held at the College. The first well-organized farmers' institute conducted under the auspices of the Faculty was held at Manhattan, November 14, 1868, and this was followed by a similar gathering at Wabaunsee, November 21 and 22 of the same year. In 1868 the Board of Regents adopted a resolution recommending "that a system of lecturing on agricultural subjects at this College and the populous settlements of the several counties of the state should be conducted so that the benefits of farming according to correct agricultural principles may be disseminated throughout the state."

A few meetings were held each year for the next several years, increasing in number from 1879, but no definite appropriation for extension work was made until 1899, when $2,000 per year was appropriated for this purpose by the state legislature. The annual appropriation remained at this figure until 1905, when the legislature appropriated $4,000 for the work, to which the College added $800. Up to this time no regular staff for extension work was employed, and all extension activities were conducted by a committee. In October of that year, however, a superintendent to organize the institute work was selected by the Board of Regents, and in July, 1906, the Department of Farmers' Institutes was formally organized.

The interest in extension work throughout the state then developed rapidly. In 1907 the legislature appropriated $10,500 for the two years, to which the College added $1,000. In 1909 $52,500 was appropriated by the legislature for the biennium, and the following appropriations were made by the succeeding legislatures: for biennium 1911-'13, $75,000; for the biennium 1913-'15, $95,000; $92,922.72 for 1915-'17; for the biennium 1917-'19, $71,260.54; $69,000 for the biennium 1919-'21; and $71,000 for the biennium 1921-'23.

This rapid development of extension work was made possible not only because the people of the state wished to have such work done, but because much new light has been thrown on the essentials in agriculture by the effective experimental work done by the Experiment Stations and by the United States Department of Agriculture.

In 1914 the federal government felt that the useful and practical information on subjects connected with agriculture and home economics developed by the experiment stations, by the Department of Agriculture, and by the experience of the best farmers and farm homes should be made more readily available to everyone; and in order that this information might be more fully and effectively diffused among the people of the several states and its practical application encouraged, the congress of the United States, in 1914, passed the Smith-Lever bill, which provides for "coöperative agricultural extension work between the agricultural colleges in the several states receiving the benefits of an act of congress approved July 2, 1862, and of acts supplementary thereto, and the United States Department of Agriculture." To

further this act the congress provided for an annual appropriation of $480,000, of which $10,000 is paid each year to each state which assents to the provisions of the act. This initial appropriation is increased each year for seven years, such increase being allotted annually to each state in the proportion which the rural population of such state bears to the total rural population of all the states, providing a sum equal to such increase has been appropriated for that year by the legislature of such state, or has otherwise been provided from within the state, for the maintenance of the coöperative agricultural extension work.

Under this act the coöperation of the agricultural colleges and the United States Department of Agriculture has been assured, extension work has become a national as well as state project, and its effectiveness has been greatly increased.

The governor of the state and the Kansas legislature of 1914 accepted the provision of the Smith-Lever act immediately, and $10,000, therefore, was secured from the federal government for extension work for the year ending July 30, 1915, and for each succeeding year thereafter. The additional sums coming from the federal funds under this act to the state for the years ending June 30, 1916, and 1917, respectively, were $14,555.45 and $26,685, for the years 1918 and 1919, $48,814.55 and $60,944.10, respectively; for the years 1920 and 1921, $63,073.65 and $75,203.20, respectively; and for the years 1922 and 1923, $80,641.37 and $91,841.56, respectively. These sums were duplicated by an equal appropriation by the legislature of Kansas, and in addition, from the appropriation made to the Agricultural College for all its work, $34,000 was set aside for extension work for the year ending June 30, 1920. During the war congress made an emergency appropriation to extension work, in order that special attention might be given to maximum production of food, conservation and economic utilization of farm products. This appropriation terminated June 30, 1919. There was such great demand for continuation of much of the work started under this appropriation with a view to carrying it on a more constructive and permanent basis, that congress appropriated funds for this purpose, effective July 1, 1919. This is known as the supplementary federal Smith-Lever appropriation. The total sum for extension work under the Smith-Lever act and from state funds for the year ending June 30, 1921, therefore, is as follows: From the federal government, through the Smith-Lever act, $85,203.20; from the federal government through the supplementary Smith-Lever appropriation, $36,388.65; from the state through the Agricultural College, $34,000; from the state direct, appropriation to offset the Smith-Lever appropriation, $75,203.20; from county appropriations offsetting the supplementary federal Smith-Lever appropriation, $36,388.65; total, $267,183.70.

County funds are appropriated for the support of the county farm bureaus through a special act of the legislature enabling the county commissioners to levy a direct tax for this purpose. (Session Laws of Kansas for 1915, p. 204, ch. 166, sections 1, 2 and 3; Session Laws of Kansas for 1919, p. 217, ch. 157, sections 1, 2 and 3.)

The rapid growth of extension work has demanded efficient administrative machinery. In the judgment of the president of the College and the Board of Regents it became necessary to create, in December, 1912, a Division of College Extension coördinate with the other divisions of the College. This at first was subdivided into four distinct sections or departments, but the increase in work and personnel of the division has made necessary a reorganization into eight departments, namely: institutes and extension schools, county-agent work, boys' and girls' club work, home economics, home demonstration-agent work, rural engineering, rural service, and home-study service, each with its own head and staff. The heads of the departments are responsible to the director, who is dean of the Division of College Extension. Through this organization it is possible to administer the extension work effectively and economically, to reach directly more than 500,000 people in the state each year, and to conduct some activity in every county.

Publications covering practical subjects in the field of agriculture, home

economics and rural engineering are issued from time to time by the Division of College Extension as bulletins, circulars and leaflets. The authors of these publications are the extension specialists or the specialists of the departments in the other divisions of the College. The regular publications of the Agricultural Experiment Station also are used extensively in the extension work. A series of publications in coöperation with the United States Department of Agriculture is receiving special attention. Extension publications are mailed regularly to a list, composed of members of farm and home institutes, homemakers' clubs, extension schools, and farm bureaus; *i.e.,* to members of organizations coöperating closely with the Agricultural College. Any citizen of the state, however, on request, may secure copies of individual publications.

While the extension work is directed by the Division of College Extension for administrative efficiency, its scope would be limited were it not for the close coöperation of the other divisions and departments of the College, which not only help in supplying lectures for agricultural meetings and extension schools, material for publication, assistance in demonstration work and helpful counsel, but also are responsible for all subject matter taught by the extension specialists.

Institutes and Extension Schools

AGRICULTURAL EXTENSION SPECIALISTS

T. J. TALBERT, in Charge

N. L. HARRIS, Poultry
L. E. WILLOUGHBY, Crops
OTIS WADE, Zoölogy
E. B. WELLS, Soils
E. G. KELLY, Entomology
ROY W. KISER, Animal Husbandry
J. J. BAYLES, Crops
A. J. SCHOTH, Garden and Crops Clubs
————, Swine and Baby Beef Production
CARL G. ELLING, Animal Husbandry
C. R. GEARHART, Dairy
W. T. CRANDALL, Dairy
L. C. WILLIAMS, Horticulture
T. A. CASE, Animal Diseases
E. A. STOKDYK, Plant Pathology
E. L. RHOADES, Farm Management Demonstrations

The Department of Institutes and Extension Schools has direct supervision over farm and home institute organizations, all extension schools in agriculture and home economics, and the work of the agricultural extension specialists. The department also has charge of the program and arrangements for Farm and Home Week, an annual state-wide farmers' meeting, and the scheduling of judges to county and local fairs.

Each farm and home institute of the state is an association or farmers' club, with regular officers, constitution and by-laws. Some organizations hold six or more monthly meetings, and practically all of them have no fewer than three, because no institute organization can obtain state aid unless in addition to the annual meeting, at which some representatives of the College must be present, it also holds at least three local meetings. The College plans to send two specialists to the annual meeting—one in agriculture and one in home economics—to present certain well-defined lessons, and to give the results of demonstration work for the county or locality. The specialists and their subjects are chosen because of a known need or interest of a particular community or a plan to start or encourage certain definite lines of work.

The programs for all annual meetings are based on suggested outlines sent out by this department. These are completed and returned by the local officers. The department furnishes literature, on request, for members who are to take part in the program of an institute, grange, farmers' union or other organization.

The monthly meetings which are held by many of the local organizations in this state are an important feature of the institute work. These meetings are usually held on the second Saturday afternoon of each month from September to May. The Department of Institutes and Extension Schools suggests the subject for discussion, and the same subject may be discussed in

every institute in the state. In this way certain important, timely subjects are discussed by farmers and their wives at seasonable times, thus promoting a general uniformity of action.

Each year some special topics, such as farm management, etc., are made especially important in institute programs, either for the whole state or for certain specified districts. The monthly meetings are largely concerned with the consideration of topics of value to farmers and their wives who are interested in more economical production and in establishing their agricultural program upon a peace-time basis.

Every institute has a membership paying a membership fee. The membership lists constitute the mailing list for the publications issued by this department. In addition to receiving these pamphlets each member who fills out and returns a membership blank receives from the College, from the government, or from some state experiment station, such other available literature as his interests demand.

EXTENSION SCHOOLS

The demand among men and women for instruction in the essentials of agriculture and home economics is steadily increasing. Owing to the nature of the farm and home institutes, they are able to meet this demand only in part, and for that reason extension schools or short courses in agriculture and home economics have been organized in communities which desire more complete courses in these subjects than can be given at the institutes.

The College now conducts extension schools in agriculture and home economics of from one to five days' duration, sending to each school three or four instructors. Here well-planned, comprehensive courses are given in the various lines of agriculture and home economics, so that some of the essentials of these subjects may be learned. The local committees are required to organize the classes and pay the local expenses for each school. The Agricultural College supplies the teachers and pays their traveling expenses from funds appropriated for this purpose.

In addition to these general schools, special schools in breeding, animal diseases, dairying, poultry, orcharding, road making, tractors and farm machinery, and cement construction are held in communities desiring them and willing to defray the local expenses. Five-day schools in home economics may be had on request.

Extension schools are popular where the communities are brought to understand the work given. Almost every community which has had one school has petitioned for another. Each community is now required to submit the names of at least thirty men and twenty women who agree to attend as many sessions of the school as possible. This requirement has increased materially the attendance, interest and coöperation.

EXTENSION SPECIALISTS

The specialists of this department work in extension schools and institutes during the winter months only, and a portion of this time is devoted to cooperative demonstration work in agriculture and home economics. During the spring, summer and fall they conduct special campaigns, such as silo building, poultry culling, wheat improvement, grasshopper control, cow testing, better sires, hog-cholera control, and coöperative demonstration work. The latter phase of the work of the extension specialists is being especially met by the organization of coöperative demonstration work in each branch of agriculture in a certain number of counties each year. In much of the coöperative work each specialist has from 10 to 100 or more coöperators in each county. These men and women work under the direction of the specialist and the county agent. They keep records of the work and call demonstration meetings at their farms on each trip of the specialist. The number of visits which the specialist makes to each point varies from two, in the case of the specialist in soils, to six, in the case of the specialists in horticulture and entomology. The aim in all of this coöperative demonstration

work is to show as well as to explain. This line of work is especially appreciated, and the representatives of the department have been able to meet only a fraction of the demands for it.

The extension specialist takes to the farm and farm home the newest research work of the Agricultural Experiment Station and the United States Department of Agriculture in a practical, effective and usable form. He is also of material assistance to the Agricultural Experiment Station of the College and to the United States Department of Agriculture in reporting the progress and success of demonstration work in the field. He seldom makes a trip without coming in contact with new agricultural problems or old ones requiring the attention of the research workers of the Agricultural Experiment Station. By working in the closest coöperation with the subject-matter departments of the College, the specialists become the carriers of information, not only from the Agricultural Experiment Station to the farmers, but from the farmers to the research workers of the Experiment Station. The extension specialist is, therefore, a medium through which both the Agricultural Experiment Station and the farmers can function to their mutual advantage.

To reach all the people of the state, the work of the specialist becomes largely a matter of teaching and training leaders, such as the county agents, the home demonstration agents, the boys' and girls' club agents, and project leaders. If they are successful in teaching these leaders how to carry forward their various projects they are most efficient in carrying their messages to all the farmers in the state. The specialists, therefore, are becoming more and more each year teachers of leaders instead of public speakers at general farmers' meetings as they were in times past.

Through these various leaders a definite check is kept regarding cost of production, need of follow-up work, and the progress made in the demonstration work undertaken. Haphazard, hit-and-miss extension work, therefore, has no place in our program under the present system.

The calls for extension specialists in all lines of work are so many that it is impossible to meet more than two-thirds of them for assistance from county agricultural agents and from farmers' organizations. The number of specialists is being increased rapidly, yet the work is growing still more rapidly, thus indicating a healthy condition.

FARM-MANAGEMENT DEMONSTRATIONS

Farm-management demonstrations are conducted by a farm-management specialist in coöperation with the county agents. In these demonstrations such records are taken as are essential to the determination of the net profits of the individual farms. These records are classified according to different types of farming, the profits of each type are determined, and individual farm records are compared with the average of all the farm records taken. The results of the study are made known to each farmer interested, in order that he may use the suggestions received in any need or reorganization of his own business. For those who desire it, farm account books are opened and instruction is briefly given in keeping simple records. This work was begun in September, 1914. The demand for this work was greatly increased by the enactment of the income-tax law, and the resulting need of business records by which the income might be determined, and by the demand for accurate cost-of-production figures by price-fixing commissions. The harvest labor problem is one of the largest activities of the farm-management demonstrator.

COUNTY AND LOCAL FAIRS

The animal husbandry and crops specialists devote from one to two months in judging the live stock and agricultural products at county and local fairs, which furnish an excellent opportunity for lectures and demonstration work. Large numbers of people are reached through the fair judging work. In many cases people are interested in the work of the specialists that have not been interested or reached through farmers' meetings and demonstrations. Each specialist endeavors to make his judging work as practical and instructive as possible.

FARM AND HOME WEEK

The purpose of Farm and Home Week is to interest the farmers of the state in better methods of production and of farm management that will increase farm profits, to demonstrate to farm women methods of household management that will add to the comfort and enjoyment of farm life, and to encourage farm folks in social organization that will enrich the social life of the rural community.

All meetings, lectures and demonstrations during Farm and Home Week are free of charge, and the expense of the trip to Manhattan, with reduced railroad rates, should not prevent any farmer from attending. The investment in knowledge and enthusiasm will make bigger profits on the farm.

During this week the College Experiment Station, the Extension Service, the United States Department of Agriculture, agricultural specialists and leading farmers bring to those in attendance the latest results of investigative work in all lines of agriculture, home economics and mechanical engineering. Special programs are also planned for the boys' and girls' club members.

Problems concerning crops and soils, dairying, beef cattle, horses, hogs, sheep, poultry, horticulture, community service, beekeeping and diseases of animals are discussed by some of the leading agricultural authorities in America. In addition to these lectures and demonstrations there are many other interesting features, such as the display of the live stock of the College, the barns, machinery, buildings, libraries, museums, dairy, experimental plots, orchards and gardens.

County Agent Work*

KARL KNAUS, County Agent Leader
A. F. TURNER, Assistant County Agent Leader
F. A. DAWLEY, Assistant County Agent Leader
A. L. CLAPP, Assistant County Agent Leader
G. W. SALISBURY, Assistant County Agent Leader

COUNTY AGENTS

JAMES A. MILHAM, Allen County
A. W. FOSTER, Anderson County
H. F. TAGGE, Atchison County
R. E. WILLIAMS, Barton County
A. C. MALONEY, Bourbon County
H. S. WISE, Butler County
J. A. HENDRIKS, Chase County
ROY E. GWIN, Cherokee County
A. I. GILKISON, Cheyenne County
R. W. MCCALL, Clark County
ROBT. E. CURTIS, Clay County
T. F. YOST, Cloud County
C. R. JACCARD, Coffey County
E. L. GARRETT, Comanche County
W. L. TAYLOE, Crawford County
F. H. DILLENBACK, Doniphan County
R. O. SMITH, Douglas County
CARL L. HOWARD, Ellis County
CHAS. E. CASSEL, Finney County
HARRY C. BAIRD, Ford County
F. JOE ROBBINS, Franklin County
CHAS. H. STINSON, Gray County
F. J. PETERS, Greenwood County
A. B. KIMBALL, Harvey County
D. D. BROWN, Hodgeman County
E. H. LEKER, Jackson County
JOE M. GOODWIN, Jefferson County
W. W. HOUGHTON,† Jewell County
CHESTER E. GRAVES, Johnson County
H. L. HILDWEIN, Kingman County
RAYMOND F. OLINGER, Labette County
I. N. CHAPMAN, Leavenworth County
CLELL A. NEWELL, Lincoln County
C. L. MCFADDEN, Lyon County
V. M. EMMERT, McPherson County
ARTHUR L. MYERS, Marion County
JOHN J. INSKEEP, Marshall County
C. S. MERYDITH, Meade County
WM. H. BROOKS, Miami County
HAYES M. COE, Montgomery County
PAUL B. GWIN, Morris County
E. L. MCINTOSH, Nemaha County
CHAS. D. THOMPSON, Neosho County
LEO D. PTACEK, Ness County
LOUIS H. ROCHFORD, Osage County
R. P. SCHNACKE, Pawnee County
V. S. CRIPPEN, Pratt County
CARL CARLSON, Rawlins County
SAM J. SMITH, Reno County
W. B. ADAIR, Rice County
GEO. STARKEY, Rooks County
R. J. SILKETT, Rush County
E. J. MACY, Sedgwick County
FRANK O. BLECHA, Shawnee County
ARVID NELSON, Sherman County
W. A. BOYS, Sumner County
JOHN V. HEPLER, Washington County
J. F. EGGERMAN, Wichita-Greeley Counties
C. O. GRANDFIELD, Wilson County
C. A. PATTERSON, Wyandotte County

County-agent work in this state is provided for by the federal Smith-Lever act and the state farm-bureau law. The federal Smith-Lever act provides an

* The United States Department of Agriculture coöperates in furnishing part of the salary of every member of this department. In the case of the county agents, counties, through farm bureaus, furnish a part of the salary and all expenses.

† Till May 15, 1922.

appropriation which increases each year until 1922, and which is distributed among the states according to their agricultural population. Before the federal funds are available they must be duplicated within the state.

The state legislature appropriates at each session an amount equal to that available to this state from the federal Smith-Lever appropriation. In addition to this, the state farm-bureau law, effective June 17, 1919, provides that when one-fourth, or as many as 250, of the *bona fide* farmers of a county shall form a farm-bureau organization, adopt a constitution and by-laws and elect officers, and when an equipment fund of at least $800 has been provided and deposited in a local bank, the county commissioners shall appropriate at least $1,200 per year (which sum may be raised by a special tax levy), and the Agricultural College shall appropriate at least $1,200, so long as funds are available from the state or federal funds above mentioned, for the purpose of hiring a county agent or agents and paying their expenses.

Previous to 1914 county agents were financed by membership dues, private subscription and a small state appropriation. At that time a membership of at least 100, each paying dues of $5, was required. In 1914 congress passed the Smith-Lever act and in 1915 the Kansas legislature passed the farm-bureau law, which has since been the basis of the extension of this work. During the war period, July 1, 1917, to June 30, 1919, supplemental agricultural appropriations were made by congress for more rapid extension of county-agent work.

August 1, 1912, the first county agent in Kansas was employed by the Leavenworth county farm bureau. The number has increased gradually, until at the present time, January 1, 1922, there are sixty active farm bureaus in Kansas, as follows:

Allen	Doniphan	Labette	Pawnee
Anderson	Douglas	Leavenworth	Pratt
Atchison	Ellis	Lincoln	Rawlins
Barton	Finney	Lyon	Reno
Bourbon	Ford	McPherson	Rice
Butler	Franklin	Marion	Rooks
Chase	Gray	Marshall	Rush
Cherokee	Greenwood	Meade	Sedgwick
Cheyenne	Harvey	Miami	Shawnee
Clark	Hodgeman	Montgomery	Sherman
Clay	Jackson	Morris	Sumner
Cloud	Jefferson	Nemaha	Washington
Coffey	Jewell	Neosho	Wichita-Greeley
Comanche	Johnson	Ness	Wilson
Crawford	Kingman	Osage	Wyandotte

The Wichita-Greeney farm bureau has a two-county county agent, as the farm-bureau law provides that west of the line which forms the boundary of Phillips and Norton counties two counties may unite in forming a farm bureau. The organization will be extended to ten new counties during the coming year.

The county agents are active in conducting demonstrations in the best methods of production and marketing, in assisting farmers with suggestions and plans relative to farm management and the farm business, and in organizing rural activities. Field demonstrations are conducted for the purpose of introducing crops and of testing relative values of varieties already grown, and methods of cultivation and harvesting. Proper methods of the feeding, care and management of live stock, of controlling insects and live-stock and plant diseases are among the most popular demonstrations. Surveys of the farm business are made in order to study the conditions prevailing in typical areas, and possible improvements in farm-management methods that should be instituted. Improved methods of marketing and community welfare, in which better social relations are fostered, also are important features of this work. The county agent interests himself in practically every farm activity, especially where there is need of improvement.

A course suggesting special lines of training for those desiring to enter extension work will be found elsewhere in this catalogue.

Home Economics

MRS. MARY WHITING MCFARLANE, in Charge
MISS MINNIE SEQUIST, Specialist in Clothing and Textiles
MISS SUSANNA SCHNEMAYER, Specialist in Nutrition and Assistant in Institutes
MISS PEARL MARTIN, Specialist in Home Nursing and Assistant in Institutes
MRS. HARRIET ALLARD, Specialist in Household Management and Assistant in Institutes
MISS MAUDE FINLEY, Specialist in Millinery
————, Assistant and Institute Specialist
MISS GENEVIEVE POTTER, Specialist in Food Economics and Nutrition

Instruction in home economics is secured by about 800 women annually at the Agricultural College, and there are many thousand others throughout the state who have had the advantages of resident instruction either in this or some other institution. Large as this number may seem, it is small when compared to the great number of women and girls of the state to whom these courses are not available. To give as much assistance as possible to this vast majority of women is the aim of the Department of Home Economics in Extension, and with this in view, seven women are regularly employed, and two others have been employed part time as special assistants during the year. The extension work in home economics is conducted through farm and home institutes, extension schools, special women's meetings, home-makers' clubs, by judging at fairs, through lectures at chautauquas, and by means of personal correspondence. During the institute season, from October to March, four women spend full time in giving lectures and demonstrations before farm and home institutes and home-makers' clubs conducted in connection with them. From March to September, inclusive, the same specialists assist in women's meetings, in county normal institutes, and in judging at fairs, at chautauquas, and in special extension schools. From March to September all the specialists of this department give their time to intensive work upon the projects of which they are in charge.

EXTENSION SCHOOLS IN HOME ECONOMICS

Extension schools in home economics are held throughout the year as a means of carrying on the regular project work. These are of two types: those training a class, who agree in turn to pass on the instruction to others in their community; and those giving definite instruction to a class of individuals.

Special schools in clothing and millinery problems are held upon request. Clothing schools may be followed by a week's laboratory course conducted by a skilled dressmaker.

Home Demonstration Work

MISS NINA B. CRIGLER, State Home Demonstration Leader
MISS ELLEN M. BATCHELOR, Assistant State Home Demonstration Leader
MISS EVA KETTERING, Secretary to State Home Demonstration Leader
MISS ETHEL BREINER, Home Demonstration Agent, Anderson County
MISS SARA JANE PATTON, Home Demonstration Agent, Cherokee County
MISS ETHEL MCDONALD, Home Demonstration Agent, Sedgwick County
MISS FLORENCE WHIPPLE, Home Demonstration Agent, Meade County
MISS EDITH HOLMBERG, Home Demonstration Agent, Pratt County
MRS. JULIA KIENE, Home Demonstration Agent, Shawnee County
MISS MOLLIE LINDSEY, Home Demonstration Agent, Washington County
MISS MAUDE COE, Home Demonstration Agent, Wyandotte County †

Home demonstration work was made possible in August, 1917, through the passage by congress of the emergency extension bill. This bill provided funds for the employment of county and city home demonstration agents. This appropriation provided for the salaries of these agents, but the expenses and office room and equipment had to be provided by the county or city in which the home demonstration agent was placed. These expenses were met in this state in each case by a fund of $400 guaranteed by the city or county at the time the services of a home demonstration agent were requested. These

† Appointed January 1, 1922.

agents were called emergency home demonstration agents. Before the end of a year there were twenty-five of these agents in the state.

In the beginning the work was instituted in various ways and under different auspices, but after following this plan for a time it was found that it would be advantageous to defer the placing of a home demonstration agent until the counties were properly organized.

Since the state conference of home demonstration agents, which was held in August, 1918, such farm-bureau counties as have requested women agents have been organized on the basis of an ideal farm bureau. That is, the women are taken into the farm bureau as members, having all the rights and privileges accorded to any member, and they become a part of the working organization. In such counties the work of the home demonstration agent is taken up as a part of the regular farm-bureau program.

During the war the program of work of the home demonstration agent was furnished largely by the Federal Food Administrator and the needs of the times, but since that time the work has been organized upon a permanent basis and the program has been evolved through community, committee and mass meetings, each county making a program based upon the needs of the communities in the county. The home demonstration agent works to carry out this program.

Since July 1, 1921, the counties desiring a home demonstration agent are required to meet the following conditions:

1. Supply an office equipped for work and adequate stenographic help.
2. Provide a fund of not less than $500 for the purchase of equipment in addition to that provided for the county agent.
3. Provide a membership of not less than 100 farm women, each of whom pays at least $1 membership fee into the county farm bureau and has all the privileges and duties of a member as a *bona fide* farmer.
4. Secure a total county appropriation of not less than $2,400 to the county farm bureau for the salary and expenses of the county agent and the home demonstration agent.

When this is done this candidate appears before the board of the county desiring the home demonstration agent and enters into a contract with them to serve as their agent.

The work in the counties is now on a permanent basis and is met with appreciation and the same measure of success as has been accorded the county-agent work.

Boys' and Girls' Club Work

R. W. Morrish, State Club Leader
Alene Hinn, Assistant

Boys' and girls' club work has become one of the very important phases of Agricultural College extension service. The club work is divided into club demonstrations. Each demonstration represents some specific phase of farm or home activities, such as baby-beef production, pig feeding, poultry hatching, canning, meal preparation, etc.

Clubs are organized and conducted in coöperation with farm bureaus, farmers' institutes, county boards of education, and business men's organizations. Any community may have a club by interesting five or more boys and girls in one of the club demonstrations and by having them agree to carry on the work as outlined by county and state leaders. Each club should have an adult local leader to act, in charge of the club members. Through these clubs the College is able to reach and serve a large class of young people which it could neither reach nor serve in any other way. A large number of boys and girls receive an incentive for higher training in agriculture and home economics and gain their first acquaintance with the College through the club work. Boys and girls receive frequent visits from the county extension agents, and the local leaders and club groups are given first-hand information by visits of the subject-matter specialists and other College representatives. Written

material is prepared by the College specialists and sent out by the state club leader through the county agent's office, and to the club members, giving them definite information regarding the results of many of the more important experiments conducted by the Agricultural Experiment Station, and regarding farm practices recommended by the College. Some of the most valuable methods and practices which the College has to offer are put into actual practice by these young people and demonstrated to the community.

Complete records showing expenses and receipts are kept by the boys and girls, and they meet now and then with their local and county leaders to consider various matters pertaining to their different projects. Through the organization of the club, much valuable experience in leadership is had by hundreds of boys and girls who have no other source for such experience. Exhibits at local, county and state contests are entered by club members. At the close of the club season the different club members send in their records and stories. In short, the club boys and girls shoulder responsibilities, meet with failure as well as with success, and do on a small scale what they will be obliged to do on a larger scale when in later years they become real farmers and home-makers.

Rural Engineering

MARK HAVENHILL, Extension Engineer, in Charge
WALTER G. WARD, Extension Architect

At one time the person who failed at other occupations could take up farming, as a last resort, and still manage to live. That time has passed. The modern farm is equipped with power machinery, a water system, a lighting system, a sewage system, up-to-date buildings, and a shop. The installation and maintenance of this equipment require a considerable knowledge of engineering. It is the duty of the Department of Rural Engineering to disseminate this engineering information and to render all the assistance possible to farmers in the solution of their engineering problems.

The extension engineer offers suggestions and assistance in the solution of the drainage, irrigation, machinery, water-supply, and sewage-disposal problems. Field visits and surveys are made, from which plans and specifications are prepared and a written report submitted. A copy of these reports is placed on file in the county agents' offices, and these reports are used many times as patterns in other engineering problems of a like nature. By this and other means a general campaign of rural engineering education is carried on.

Owing to the fact that a very large proportion of the farm buildings of Kansas will soon need replacing or remodeling, and due to the increased cost of labor, the farmstead and farm buildings must be more efficiently arranged. The extension architect offers assistance with the planning of the farmstead, the farm buildings, the water and sewage systems, and many related conveniences. A number of farm building plans and specifications, with particular reference to Kansas conditions, have been prepared. These plans are furnished to any one interested, at the cost of blue-printing.

The engineers of this department answer thousands of mail inquiries of an engineering nature each year, and furnish hundreds of small sketches showing how particular engineering problems can be solved. The services of the engineers of this department are free except for the usual charge for traveling and local expenses.

Rural Service

———, Director

The work of the Rural-service Department is now on the project basis, approved by the States Relations Service of the United States Department of Agriculture, under the title "Rural Organization," and is now conducted as a state project, wholly from state extension funds.

The object of this department is to advise with and assist county agents and farm bureaus in coördinating the activities of groups of farmers, community leaders and farmers' organizations for more effective work in the development of the agriculture and home economics of the rural community.

Conferences of leaders are held in local communities for discussion and consultation in regard to the work undertaken by organized groups, and ways in which the efforts of these groups may be coördinated. Suggestions are given by letter and personal visit to individuals and groups contemplating organization, as to what type of organization is best suited to local needs. Where communities lack unity, because of a multitude of unrelated and overlapping organizations, efforts are made through personal visits and correspondence to interest the organizations in coördinating their activities through the farm bureau.

Programs for all-round community development in harmony with county farm-bureau plans are worked out on the request of community leaders in cooperation with other specialists on the extension staff. One state-wide rural organization conference is conducted each year. At this conference methods of rural organization and community programs are given consideration.

Home-study Service

(Correspondence Study)

GEORGE GEMMELL, Head of Department
CHARLES NITCHER, Animal Husbandry
P. P. BRAINARD, Education
FLOYD PATTISON, Industrial Subjects
RETA DIELMANN,* History and Civics
ADA BILLINGS,† History and Civics
EDITH HOWARTH,‡ Education
J. T. QUINN, Horticulture
———, Home Economics

NOTE.—The Faculty members employed in the Home-study Service devote their entire time to the work of teaching by correspondence. They keep in close touch with the various departments of the College, and all credit courses which are offered by correspondence must first meet the requirements of the regular College departments handling the courses in residence.

There are many people in Kansas who, for many reasons, cannot attend classes on the campus, although they have interest in and need for the work offered by the Kansas State Agricultural College. Moreover, it has quite generally come to be recognized that even the completion of a college course does not end the necessity for education. It is in recognition of these manifold demands, far greater in number than the resident attendance at the College, that the institution offers to citizens of the state an opportunity to study at home various lines of agriculture, home economics, mechanic arts, farm engineering, and numerous high-school subjects.

The Home-study Service attempts to meet the widely varying needs and conditions of the people of Kansas by offering the following types of service:

1. *Extension or Vocational Courses,* which are complete, comprehensive

* Absent on leave, year 1921-'22.
† Appointment for the year 1921-'22.
‡ Resigned.

courses adapted to the needs of those who are ambitious for thorough, scientific training to meet in an effective way the various practical and technical problems found in the various vocational activities. These afford the nearest possible home equivalent of a college education, and offer the particular advantage of utilizing the practical situations of life as their laboratory and shop exercises. For full information concerning the Vocational Courses, write to Home-study Service for catalogue.

2. *Credit Courses,* which are offered for those who for any reason are unable to attend school and wish to do work of a type that can be used for college or high-school credit. These courses are also of value to those who wish to use their time to advantage when school is not in session. For further information concerning Credit Courses, write to Home-study Service, K. S. A. C., Manhattan, Kan.

3. *Special Courses for Teachers,* which are a series designed as helps for teachers of industrial, agricultural and home-economics subjects. A particular effort is made in these courses to make available to the teachers of the state all the materials and aids which the Kansas State Agricultural College can offer them.

4. *Emergency Courses.* During the war a number of these courses were offered to help meet the new difficulties and duties imposed. It is the purpose of the department to continue a service of this kind. Whenever new situations arise calling for such courses, requests for them will be appreciated.

5. *Study Centers.* Under regulations established for this purpose, study centers may be arranged where college subjects may be studied under the personal direction of members of the College Faculty.

6. *Information Service,* the purpose of which is to afford a definite source to which technical or informational questions may be referred. All such questions which are referred to the Home-study Service will be promptly answered if possible, or referred to a specialist in the College or elsewhere, who will supply the information desired.

7. *Lantern-slide Service.* A number of sets of lantern slides on agricultural, industrial and home economics subjects have been prepared by specialists in the College with particular reference to Kansas conditions. These will be loaned, free of cost (except transportation charges), to any responsible resident of Kansas. For further information concerning these, inquiries should be addressed to the Home-study Service of the College.

VOCATIONAL COURSES

Subjects Covered. Vocational courses treat subjects covered in the three general fields, *Agriculture, Industry* and *Home Economics.* The list which follows is being revised from time to time according to demands.

By Whom Conducted. The courses are prepared and taught by specialists in correspondence study, who keep in close touch with the College Faculty in their respective fields.

Methods of Work. Each course is based upon a recognized standard text treating the subjects, and is covered in a number of definite lessons, ranging from ten to twenty. A written report is required of the student on each lesson, according to instructions sent upon enrollment.

Examinations. Examinations in courses completed may be taken at the College or locally under the direction of some suitable person with whom arrangements can be made, such as a county superintendent or city superintendent.

Fees. The enrollment fee for a single vocational course is $3 ($6 to nonresidents of Kansas).

Books and Stationery. Students will be expected to provide all textbooks, drawing instruments, stationery and other materials required in their courses, and to pay postage on the lessons sent in.

AGRICULTURE

EA 1. Essentials of Agriculture.
EA 2. Elementary Agricultural Chemistry.
EA 3. Soils.
EA 4. Cereal Crops.
EA 5. Forage Crops.
EA 6. Gardening.
EA 7. Orcharding.
EA 8. Feeds and Feeding.
EA 9. Animal Breeding.
EA 10. Types and Classes of Live Stock.
EA 11. Farm Dairying.
EA 12. Poultry Production.
EA 13. Economic Entomology.
EA 14. Poultry Management.
EA 16. Greenhouse Management.
EA 17. Floriculture.
EA 18. Landscape Gardening.
EA 19. Farm Forestry.
EA 20. Dairy Products.
EA 21. Milk Testing.
EA 23. Breeding Types of Live Stock.
EA 24. Horse Production.
EA 25. Dry-land Farming.
EA 26. Beef Production.
ET 27. Pork Production.
EA 28. Sheep Raising.
EA 29. Live-stock Production.
EA 30. Beekeeping.
EA 31. Farm Management.
EA 32. Poultry Culling.

HOME ECONOMICS

EH 1. Household Management.
EH 2. Foods and Cookery I.
EH 3. Foods and Cookery II.
EH 5. Sewing.
EH 6. Textiles.
EH 7. Elementary Needlework.
EH 8. Millinery.
EH 9. Home Nursing.
EH 11. Home Decoration.
EH 12. Personal Hygiene.
EH 13. Household Bacteriology.
EH 14. Child Life and Care of Children.
EH 15. Household Chemistry.
EH 16. Costume Design.
EH 17. Laundering.

INDUSTRIAL SUBJECTS

EI 1. Shop Mathematics.
EI 2. Mechanical Drawing, Applied.
EI 3. Architectural Drawing.
EI 4. Constructive Carpentry and Inside Finishing.
EI 5. Heating and Ventilating.
EI 6. Farm Drainage.
EI 7. Farm Buildings.
EI 8. Concrete Construction.
EI 9. Farm Blacksmithing.
EI 10. Farm Machinery.
EI 11. Steam Boilers and Engines.
EI 12. Gasoline Engines.
EI 13. Blacksmithing.
EI 14. Plane Surveying.
EI 15. Highway Construction.
EI 16. Roads and Pavements.
EI 17. Automobiles.
EI 18. Machine Shop Work.
EI 19. Bridge and Culvert Construction.
EI 20. Elementary Woodworking.
EI 21. Farm Woodworking.
EI 22. Foundry Practice.
EI 23. Gasoline and Oil Traction Engines.
EI 24. Pattern Making.
EI 25. Plumbing.
EI 26. Practical Electricity.
EI 27. Sheet Metal Drafting.
EI 28. Strength of Materials.
EI 29. Steam Traction Engines.
EI 30. Structural Engineering I.
EI 31. Automotive Ignition.

CREDIT COURSES

GRADES OF WORK. Credit courses are offered in both high-school, or entrance-credit subjects, and college subjects. The courses in each case are the full equivalent of resident courses in like subjects.

BY WHOM CONDUCTED. The courses are prepared under the supervision of the heads of departments of the Agricultural College Faculty, and are taught by specialists in correspondence study under the same regulations that govern resident work.

EXAMINATION. Examinations may be taken at the College or under conditions approved by the College. In the latter case, arrangements can often be made with the local county superintendent, or city superintendent of schools, to conduct the examination.

REGULATIONS. 1. Enrollments for correspondence-study work will be received at any time during the year, and students may continue their work uninterruptedly throughout the entire year.

2. Correspondence students will be expected to complete any course for which they are enrolled within twelve months from the date of enrollment.

3. Not more than two courses are advised by correspondence at any one time. It is recommended that a student carry but one subject at a time, particularly where only part of the time is given to the work.

4. Each subject listed under the various departments constitutes what is known as a correspondence "course."

5. Students enrolling for correspondence courses must meet the prerequisites the same as if undertaking the work in residence.

6. A student may not be enrolled for correspondence work while in attendance at any institution of learning without special permission from the dean or proper authorities in the institution of which he is a student.

FEES. An enrollment fee of $10 is charged for residents of Kansas; $15 for nonresidents. For this amount the student is entitled to eight semester hours of college work, or three semester credits of high-school work, and is given a year in which to finish them. No fee is refunded because of the student's inability to enter upon the course for which once registered. Extensions of time can be granted only where the work has been delayed because of personal illness of the student. All such cases must be taken up individually with the director of this department.

BOOKS AND STATIONERY. Students will be expected to provide all textbooks, drawing outfits, stationery and other materials required in their courses, also to pay postage on lessons one way.

FOR WHOM INTENDED. Though credit courses offered by the Home-study Service are still limited, the number is steadily growing, and it is the purpose of the department to add courses whenever a demand for them becomes evident. The other types of work are sufficiently broad to be of value to a great variety of people. The following classes in particular should be able to profit by them:

1. Those who have completed a common-school course, but for any reason are unable to attend high school.
2. High-school graduates temporarily or permanently unable to attend college.
3. Students whose attendance at high school or college has been interrupted.
4. Students who for any reason have fallen behind in their work and wish to use their spare time catching up.
5. The strong, aggressive student who does not wish to halt his progress for vacations and other interruptions.
6. High-school and grade classes in practical courses that need supplementing and enrichment.
7. Teachers who wish further professional or other training, or who need help in planning and conducting their work.
8. Professional and business men who wish to keep growing along some line of interest, professional or avocational.
9. Clubs and other organizations which wish to make systematic studies.
10. Men and women who wish effective help in meeting the demands in their vocations for technical and scientific knowledge and training.

COURSES OF INSTRUCTION

The list of Credit Courses offered is being extended constantly, the new courses added in each case being those for which there seems to be the most demand. The following is the present list:

High-school Courses

		Number of assignments	*Unit H. S. credit*
	AGRICULTURE		
PCA 1.	Elementary Agriculture I	20	½
PCA 2.	Elementary Agriculture II	20	½
	DRAWING		
PCD 3.	Shop Mechanical Drawing I	20	½
PCD 4.	Shop Mechanical Drawing II	20	½
	ENGLISH		
PCE 1.	Grammar and Composition (first year)	20	½
PCE 2.	Literature (first year)	20	½
PCE 3.	Composition (second year)	20	½
PCE 4.	Literature (second year)	20	½
PCE 5.	Composition (third year)	20	½
PCE 6.	Literature (third year)	20	½

HISTORY

PCH-A. Ancient History	20	½
PCH 3. Medieval History	20	½
PCH 4A. Modern History I	20	½
PCH 4 B. Modern History II	20	½
PCH 5. American History I	20	½
PCH 6. American History II	20	½
PCH 7. Community Civics	20	½
PCH 8. Civics	20	½

MATHEMATICS

PCM 1. Algebra I	20	½
PCM 2. Algebra II	20	½
PCM 3. Algebra III	20	½
PCM 4. Plane Geometry I	20	½
PCM 5. Plane Geometry II	20	½
PCM 6. Solid Geometry	20	½
PCM 7. Bookkeeping	20	½

SCIENCE

PCS 1. Physical Geography	20	½
PCS 2. Botany (in preparation)	20	½

College Credit Courses

DIVISION OF AGRICULTURE

AGRONOMY	*Semester credits*	*Assignments*
CA 3. Grain Crop Production	2	16
CA 4. Forage Crop Production	2	16
ANIMAL HUSBANDRY		
CL 1. Types and Classes of Live Stock	1	8
CL 2. History of Breeds	2	16
CL 3. Principles of Feeding (in preparation)	3	24
CL 4. Pork Production	2	16
CL 5. Horse Production	2	16
CL 6. Sheep Production	2	16
HORTICULTURE		
CH 1. Orcharding	2	16
CH 2. Gardening	2	16
CH 3. Floriculture	2	16
CH 4. Greenhouse Construction and Management	3	24
CH 5. Landscape Gardening	1	8
CF 1. Farm Forestry	3	24
POULTRY HUSBANDRY		
CPP 1. Farm Poultry Production	1	8

DIVISION OF ENGINEERING

APPLIED MECHANICS		
CE 5. Concrete Construction	1	8
CE 2. Engineering Drawing	2	16
CE 6. Machine Drawing I	2	16
CE 4. Mechanism	3	24
CE 11. Descriptive Geometry	2	20
CIVIL ENGINEERING		
CE 1. Highway Engineering I	2	16
SHOP PRACTICE		
CE 7. Metallurgy	2	16
MECHANICAL ENGINEERING		
CE 3. Farm Motors	2	16
CE 8. Heating and Ventilation A	2	16
CE 9. Airplane Mechanics	1	18
CE 10. Elements of Steam and Gas Power Engineering	3	24

DIVISION OF HOME ECONOMICS

CLOTHING AND TEXTILES		
CHE 1. Textiles	2	16
FOOD ECONOMICS AND NUTRITION		
CHE 2. Foods Study	1	8

HOUSEHOLD ECONOMICS

CHE 3.	Sanitation and Public Health	3	24

DIVISION OF GENERAL SCIENCE

ECONOMICS AND SOCIOLOGY

CEc 1.	Economics	3	24
CS 2.	Rural Sociology	3	24
CS 3.	Sociology	3	24
CS 4.	Rural Organization	2	16

EDUCATION (PROFESSIONAL)

CP 1.	Industrial Education	3	24
CP 2.	Educational Psychology	3	24
CP 3.	Educational Sociology	3	24
CP 4.	History of Education	3	24
CP 5.	Principles of Education	3	24
CP 6G.	Methods of Teaching in the Grades	3	24
CP 6H.	Methods of Teaching in High School	3	24
CP 7.	Educational Administration	3	24
CP 8.	Psychology	3	24
CP 9.	School Discipline	2	16
CP 10.	Rural Education	3	24
CP 11.	Agricultural Education	3	24
CP 12.	Home Economics Education	2	16
CP 13.	Vocational Guidance	1	8

ENGLISH

CCE 1.	College Rhetoric I	3	24
CCE 2.	College Rhetoric II	3	24
CCE 3.	Business English	3	24
CCE 4.	The Short Story	3	24

GEOLOGY

CG 1.	General Geology	3	24

HISTORY AND CIVICS

CHC 1.	Community Civics	3	24
CHC 2.	Modern Europe I	3	24
CHC 4.	English History	3	24

MATHEMATICS

CM 7.	Plane Trigonometry	3	25
CM 8.	College Algebra	3	25

The Agricultural Experiment Station

The Kansas Agricultural Experiment Station was organized under the provisions of an act of congress, approved March 2, 1887, which is commonly known as the "Hatch act," and is officially designated as—

"An act to establish agricultural experiment stations in connection with the colleges established in the several states under the provisions of an act approved July 2, 1862, and the acts supplementary thereto."

The wide scope and far-reaching purposes of this act are best comprehended by an extract from the body of the measure itself, in which the objects of its enactment are stated as being—

"To aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and practice of agricultural science."

The law specifies in detail—

"That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and waters; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses for forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable."

On the day after the Hatch act had received the signature of the President, the legislature of Kansas, being then in session, passed a resolution, dated March 3, 1887, accepting the conditions of the measure, and vesting the responsibility for carrying out its provisions in the Board of Regents of the Kansas State Agricultural College.

Until 1908 the expenses of the Experiment Station were provided for entirely by the federal government. The original creative act (the Hatch act) carried an annual congressional appropriation of $15,000. No further addition to this amount was made until the passage of the Adams act, which was approved by the President March 16, 1906. This measure provided, "for the more complete endowment and maintenance of agricultural experiment stations," a sum beginning with $5,000, and increasing each year by $2,000 over the preceding year for five years, after which time the annual appropriation was to be $15,000—

"To be applied to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry of the United States, having due regard to the varying conditions and needs of the respective states or territories."

It is further provided that—

"No portion of said moneys exceeding five percentum of each annual appropriation shall be applied, directly or indirectly, under any pretense whatever, to the purchase, erection, preservation or repair of any building or buildings, or to the purchase or rental of land."

The Adams act, providing as it does for original investigations, supplied the greatest need of the Experiment Station—means of providing men and equipment for advanced research. Only such experiments may be entered upon, under the provisions of this act, as have first been passed upon and approved by the Office of Experiment Stations of the United States Department of Agriculture.

In the neighborhood of sixty projects, covering practically all phases of agricultural investigation, are being studied by the members of the Experiment Station staff.

The farms, live stock, laboratories, and general equipment of the College are all directly available for the use of the Experiment Station.

The results of the work of the Experiment Station are published in the form of bulletins, circulars, and scientific papers other than bulletins and circulars. These bulletins are of two classes—those which record the results of research work of a purely scientific character and those which present technical information in a simplified form, suitable for the general reader. The circulars are brief and condensed popular presentations of data which call for immediate application, as well as timely and useful information not necessarily new or original. The scientific papers are usually published as reprints or addresses given before scientific bodies. These reprints contain original information or report definite steps in the progress of investigations under way.

All bulletins and other publications from the Experiment Station are sent without charge to citizens of the state. Any person in the state who so desires may have his name placed on the permanent mailing list of the Station.

Letters of inquiry and general correspondence should be addressed: "Agricultural Experiment Station, Manhattan, Kan." Special inquiries should be directed, so far as possible, to the heads of departments having in charge the matters concerning which information is desired.

CONTROL WORK OF THE STATION

In addition to the work of agricultural investigation, the state has enlarged the activities of the Station along various lines of state executive or control work.

One of the important lines of control work is that of state dairy commissioner. This official, appointed by the Board of Administration, and having his office at the seat of the Agricultural College, is required (Laws of 1909, ch. 237)—

"To inspect or cause to be inspected all the creameries, public dairies, butter, cheese and ice-cream factories, or any place where milk or cream or their products are handled or stored within the state, at least once a year, or oftener if possible."

He may in connection with the Board of Administration of the College—

"Formulate and prescribe such reasonable rules and regulations for the operation of creameries, butter, cheese and ice-cream factories and public dairies as shall be deemed necessary by such board to fully carry out the provisions of this act."

He may act on complaints regarding the sale of unwholesome or unclean dairy products, and may prohibit their sale. He may—

"Condemn for food purposes all unclean or unwholesome milk, cream, butter, cheese or ice cream, wherever he may find them."

Another important state function is that of the State Entomological Commission. (Laws of 1907, ch. 386; 1909, ch. 27.) This commission, created in 1907, was established—

"To suppress and eradicate San José scale and other dangerous insect pests and plant diseases throughout the state of Kansas."

The professors of entomology at the Agricultural College and at the University of Kansas are by law designated as two of the five members of the above commission. Acting under the title of state entomologist, they divide between them the territory of the state, for the purpose of inspection.

They are empowered—

"To enter upon any public premises . . . or upon any land of any firm, corporation or private individual within the state of Kansas, for the purpose of inspection, destroying, treating, or experiment upon the insects or diseases aforesaid."

They may treat or cause to be treated "any and all suspicious trees, vines, shrubs, plants, and grains," or, under certain conditions, may destroy them. They must annually inspect all nursery stock, and no nursery stock is to be admitted within the state without such inspection.

Concerned with the live-stock interests of the state is the State Live Stock Registry Board, with regard to which there is the following provision (Laws of 1913):

"Every person, persons, firm, corporation, company or association that shall stand, travel, advertise or offer for public service in any manner any stallion in the state of Kansas, shall secure a license certificate for such stallion from the Kansas State Live Stock Registry Board, as herein provided. Said board shall consist of the dean of the Division of Agriculture, head of the Animal Husbandry Department, and the head of the Veterinary Department of the Kansas State Agricultural College."

To this board is assigned the duty of licensing stallions used for breeding purposes within the state, and authority to verify their breeding and to classify them under the following heads: pure bred, grade, crossbred, and scrub. No animal not thus approved and licensed with the board is permitted to be used for public breeding purposes.

By legislative act (Laws of 1909, ch. 49), a "division of forestry" at the Agricultural College is also provided for in the following terms:

"For the promotion of forestry in Kansas there shall be established at the Kansas State Agricultural College, under the direction of the Board of Regents, a division of forestry. The Board of Regents of the Kansas State Agricultural College shall appoint a state forester, who shall have general supervision of all experimental and demonstration work in forestry conducted by the Experiment Station. He shall promote practical forestry in every possible way, compile and disseminate information relative to forestry, and publish the results of such work through bulletins, press notices, and in such other ways as may be most practicable to reach the public, and by lecturing before farmers' institutes, associations, and other organizations interested in forestry."

The state has also placed the Experiment Station in charge of the execution of the acts concerning the manufacture and sale of live-stock remedies and commercial feeding stuffs (Laws of 1913), and also of commercial fertilizers (Laws of 1907, chapter 217). It is provided by the statutes that every brand of live-stock remedy and every brand of commercial feeding stuffs offered or held for sale or sold within the state of Kansas shall be registered in the office of the director of the Agricultural Experiment Station of the Kansas State Agricultural College, and each sale of any such brand not so registered shall constitute a separate violation of this act.

And—

"Except as herein provided, it shall be unlawful within the state of Kansas to sell, offer for sale, or expose for sale any commercial fertilizer which has not been officially registered by the director of the Agricultural Experiment Station of the Kansas State Agricultural College."

These general provisions are limited in their application by important exceptions stated in the laws. The fees collected under these acts are used to defray the necessary expenses incurred in carrying out the provisions of the acts.

It will thus be seen that the state of Kansas is making increasing use of the scientific staff of the Experiment Station in matters of state importance requiring the application of technical knowledge.

Branch Agricultural Experiment Stations

FORT HAYS BRANCH STATION

The land occupied by this Station is a part of what was originally the Fort Hays military reservation. Being no longer required for military purposes, it was turned over to the Department of the Interior, October 22, 1899, for disposal under the act of congress of July 5, 1884. Through the influence of Senator, later Regent, W. A. Harris, and of Congressman Reeder, a bill was passed in the fifty-sixth congress, setting aside this reservation "for the purpose of establishing an experimental station of the Kansas Agricultural College and a western branch of the Kansas State Normal School thereon and a public park." This bill was approved by the President on March 28, 1900. By act of the state legislature, approved on February 7, 1901, the act of congress donating this land and imposing the burden of the support of these institutions was accepted. The same session of the legislature passed an act providing for the organization of a branch experiment station and appropriating a small fund for preliminary work. In the division of this land, the College received 3,560 acres.

The land at the Fort Hays Branch Station consists mainly of high, rolling prairie, with a limited area of rich alluvium bordering on a creek, and is situated on the edge of the semi-arid plains region. It is well suited for experimental and demonstration work in dry farming, in irrigation, and in crop, forestry, and orchard tests, under conditions of limited rainfall and high evaporation.

The work of this Station may be divided into two divisions: (A) experimental projects, (B) general farm and live-stock work. The experimental projects are as follows: Dry-farming investigations, forage-crop investigations, cereal-crop investigations, forest, nursery and park demonstrations and investigations, farm dairying, and experiments in the feeding and breeding of live stock. All this work is confined to the study of the problems peculiar to the western half of the state, and relates especially to crop production under limited rainfall, to the development of varieties better adapted to the climatic conditions there prevailing, and to studies of the systems of animal husbandry and dairy husbandry suited to this region. The facilities of this Station are being used for the growing of large quantities of pure seed of the strains and varieties which have proved in actual test to be most productive in the western part of the state.

GARDEN CITY BRANCH STATION

In 1906 the county commissioners of Finney county purchased, for purposes of agricultural experimentation, a tract of land amounting to 320 acres, situated four and one-half miles from Garden City, on the unirrigated upland.

The land has been leased for a term of ninety-nine years to the Kansas Agricultural Experiment Station as an "experimental and demonstration farm," for the purpose of determining the methods of culture, crop varieties, and crop rotations best suited to the southwestern portion of the state, under dry-land farming conditions. A pumping plant irrigating from eighty to one hundred acres has been installed for the purpose of investigating the expense of pumping and the cost of equipment necessary for plants of this type, which are common in the shallow-water districts between Garden City and Scott City and along the Arkansas valley. The Experiment Station's investigations in irrigation agriculture are centered at this branch station.

COLBY BRANCH STATION

The legislature of 1913 provided for the establishment of a branch experiment and demonstration station near Colby, in northwestern Kansas, "for the purpose of advancing and developing the agricultural, horticultural, and irrigation interests of this state and western Kansas." This Station was located upon a tract of three hundred and fourteen acres of land bordering upon the town site of Colby. This land was purchased by the county and deeded to the state for the purposes named above. Operations were begun in March, 1914. Cropping experiments are being conducted under dry-land conditions and under irrigation. Water is being lifted one hundred and fifty feet for irrigating a garden; fruit trees, and a few desirable crops, such as alfalfa, that could not be grown successfully in western Kansas with the natural rainfall. The primary purpose of the Colby Station is to determine the best methods of developing the agriculture of northwestern Kansas and to make it a still more desirable place to live.

TRIBUNE BRANCH STATION

At the Tribune Station experimental and demonstration work is conducted for the benefit of the surrounding territory. Special attention is paid to the problems of producing, storing, and utilizing crops for winter feeding of cattle which in summer graze the extensive range areas of the extreme western part of the state.

The Bureau of Research in Home Economics

The bureau of research in home economics conducts investigations in the scientific, economic and social problems of the home. The purpose of this research is to discover new facts and new methods of the application of scientific knowledge bearing upon the welfare of the members of the family and the conditions under which they live.

The fields of research included in the bureau are: child welfare, clothing and textiles, food economics, household administration, institutional administration, human nutrition, and dietetics.

The laboratories of the Division of Home Economics include equipment suitable for work on certain of the problems. Opportunities for surveys and investigations of conditions in the state are found through the coöperation of various educational and social agencies.

The results of all investigations are published from time to time and are available on request to all citizens of the state.

The personnel of the bureau staff includes members of the teaching faculty in home economics. Several of the departments in other divisions of the College advise or collaborate with officers of the bureau on problems of related interest.

Among the investigations in progress are the following:

A study of the causes of the failure of children in the first six grades of the Manhattan public schools, 1920-'21.

A testing out and revision of existing standards of mental development for children under five years.

Experimental studies in human metabolism.

The effect of limited diet on the growth and strength of bone.

Rate of growth after periods of slow or retarded growth induced by a diet low in ash.

Laboratory methods for bread making.

Household methods of desiccating sweet potatoes.

Experimental studies in the cookery of desiccated sweet potatoes.

Studies on the methods of preserving the color in the cookery of green vegetables.

Survey of cost and kind of food selected by individuals eating at the College cafeteria.

Systems of accounting for cafeterias and tea rooms.

A statistical study of the content of rural weeklies of interest to homemakers.

A study of the comparative efficiency of different types of vacuum cleaners.

Survey of clothing purchasing habits.

Studies of cost and suitability of wardrobes for college and high-school girls and for business women.

Studies on the wearing qualities of bed linen.

Tests of fastness of color in fabrics under exposure to light and moisture.

Studies of the kinds and amounts of sizing in fabrics.

The Engineering Experiment Station

The Engineering Experiment Station was established for the purpose of carrying on tests and research work of engineering and manufacturing value to the state of Kansas, and of collecting, preparing, and presenting technical information in a form readily available for the use of the various industries within the state. It is the intention to make all the work of the Experiment Station of direct importance to Kansas.

All of the equipment of the various engineering and scientific laboratories, the shops, and the College power plant are available for this work, while the personnel of the Station consists of members of the teaching staff from the various departments of the Division of Engineering and from other scientific departments whose work is directly related to the work of this division.

Among the tests now being carried on are: investigations on the strength of concrete; the road-making properties of various Kansas stones, gravels, and sands; stresses produced by temperature changes in rigid pavement slabs; the effect of wind resistance upon automobile performance; the losses in electric transmission lines in town and city distributing systems; the mechanical and electrical properties of commercial copper wire as used in pole-line construction; the effect of chemical composition on the durability and protective power of paints; the performance of automobile headlights; the effectiveness of automatic ventilators; the effectiveness of various types of gas-engine piston rings; and flour-mill heating systems for the prevention of infestation.

Various other investigations are being carried on upon brick, concrete, fuels, lubricating oils, pipe coverings, insulation for refrigeration, belt lacings, blacksmith coals, foundry sands, centrifugal pumps, and problems in farm architecture.

Records have been obtained of the discharge of the Kansas river, and it is hoped that a gauge can be installed at some future date, so that a continuous record can be made of the stage of the river at Manhattan, to be used in computing the flood discharge of that stream, as a basis for designing works for flood protection.

The testing laboratories of this Station have been designated by law* as the testing laboratories for the State Highway Commission and the state highway engineer, and as such have charge of the testing of all road materials for use in federal-aid road construction in this state.

The results of the investigations are published as bulletins and circulars of the Engineering Experiment Station, which are sent free to any citizen of the state upon request. Besides issuing these bulletins, the Station answers yearly many hundreds of requests for information upon matters coming within its field.

Requests for bulletins and general correspondence should be addressed to Engineering Experiment Station, Manhattan, Kan. Requests for information in specific matters should be addressed, so far as it is possible, to the heads of departments in whose fields the particular matters lie.

* Sec. 5, ch. 64, Laws of 1917.

The Vocational School

(The Secondary School)

A. P. DAVIDSON, Principal

The Vocational School of the Kansas State Agricultural College is the new name by which the secondary school is now to be known. The former name, The School of Agriculture, was so misleading both as to rank and as to the subjects taught that it has been considered advisable to make the change in name as indicated.

The Vocational School is organized to meet the needs of young men and young women of Kansas who may need instruction more closely identified with the life of the farm, home and shop than that provided by the high schools of the state. It is also intended to meet the needs of those men and women who find themselves for any cause unable to complete an extensive course of collegiate instruction, yet who feel the necessity of a practical training for their activities in life. A large part of the student's time in the School will be spent in the laboratories and in contact with the real objects of his future work. An element of culture and general information is provided for in several semesters of English for each course and in work in history, economics, citizenship, physics, and chemistry.

The Vocational School is not a school preparatory to the College. Its sole purpose is to fit men and women for life in the open country, and to make country life more attractive; to make the workshop more efficient; in short, to dignify and to improve industrial life. It is not established to entice students away from the high school. It is for those of every walk in life who wish a larger view and greater skill in doing the world's work.

All the resources of the College are at the disposal of the Vocational School. Its students have every advantage possessed by students in the College.

All the general regulations of the College apply to the Vocational School.

THE COURSE OF STUDY

The curriculum in agriculture emphasizes the growing of crops and the raising of live stock. A minimum of theory and a maximum of practical work bring the student into close contact with the actual conditions of farm life.

The curriculum in home economics emphasizes the care of the home. Home decoration, home sanitation, cookery, and sewing receive careful attention.

The curriculum for mechanics leads to a trade. It is designed to shorten the time of apprenticeship and to prepare the way for skilled workmanship in shop or factory. The great amount of time spent in the shops should easily lead to skill and efficiency in subsequent work.

ADMISSION. Students who are fourteen years of age or older, and who have completed the eighth grade of the public schools, are admitted without examination. Students who have not completed the eighth grade are examined in arithmetic, United States history, English grammar, geography, reading, and spelling. Students who have done work in the public high schools receive credit for work done. Maturity in years and practical experience are given due consideration, but students should not consider these qualifications alone sufficient to admit them. Whenever there is a question about a student's qualifications for entering, he should correspond with the principal of the Vocational School before coming.

The principal of the Vocational School is charged with the execution of all College and Faculty rules relating to the enrollment of students in classes and their choice of studies. Students entering under the age of nineteen years are required to complete one of the three-year curricula as outlined before they choose work not included in the curriculum.

It is greatly to the advantage of the prospective student to see to it that his certificate showing work done in grammar school or high school be sent to the College as soon as possible after his work done there is finished. A permit

to register will then be sent him by the registrar in advance of his coming in September; this will greatly facilitate the work of entrance. The student will present this permit at the registration room in Nichols Gymnasium, and will not be compelled to wait his turn to meet the committee on admission.

Upon registration each student receives a certificate of his standing, which he presents to the principal of the School, who is charged with the duty of enrolling students in classes, selecting and arranging subjects, and assigning hours.

GRADES AND FAILURES. Examinations are held at stated periods and at such other times as the Faculty may provide. Absence from examination, or ten or more unexcused absences from class periods, severs a student's connection with the institution, which connection can be renewed only through the action of the principal of the School. Any withdrawals from school or class must be authorized by the principal; otherwise, continued absence is construed as failure. Parents or guardians are furnished a copy of the record of the student's work at the close of any term, if they so desire.

Curriculum in Agriculture

(THE VOCATIONAL SCHOOL)

The Arabic numeral immediately following the name of subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
Stock Judging I An. Husb. 51	3(0-6)	Stock Judging II An. Husb. 52	3(0-6)*or*
Industrial Arithmetic A Math. 51	4(4-0)	Algebra I Math. 63	4(4-0)
English I Engl. 51	4(4-0)	English II Engl. 54	4(4-0)
Beginning Poultry Poult. Husb. 51	2(1-2)	Breeds and Breeding An. Husb. 53	2(2-0)
Farm Gas Engines I Agric. Engr. 76	3(1-4)	Fruit Growing Hort. 51	3(2-2)
Carpentry I Shop 51	2(0-4)	Farm Insects Ent. 62	3(2-2)
		Elementary Botany Bot. 51	3(2-2)
Physical Training M-I Phys. Ed. 51A	1(0-3)	Physical Training M-II Phys. Ed. 52	1(0-3)
Music*		Music*	

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
Farm Crops Agron. 51	5(4-2)	Soils and Fertilizers Agron. 56	3(2-2)
Elementary Chemistry Chem. 51	4(3-2)	Elementary Agricultural Chemistry Chem. 53	4(3-2)
English III Engl. 61	4(4-0)	English IV Engl. 64	4(4-0)
Dairying Dairy Husb. 61	2(1-2)	Live-stock Production An. Husb. 55	3(3-0)
Physical Training M-I Phys. Ed. 51A	1(0-3)*or*	Physical Training M-II Phys. Ed. 52	1(0-3)*or*
Infantry I† Mil. Tr. 101	1(0-4)	Infantry II† Mil. Tr. 102	1(0-4)
Music*		Music*	
Elective, 4 credits from the following:		*Elective,* 4 credits from the following:	
Feeds and Feeding An. Husb. 54	2(2-0)	Carpentry V Shop 64	3(0-6)
Algebra I *or* II Math. 63 *or* 64	4(4-0)	Algebra I *or* II Math. 63 *or* 64	4(4-0)
Farm Gas Engines II Agric. Engr. 78	3(1-4)	Elementary Traction Engines I Agric. Engr. 67	3(1-4)
Blacksmithing I Shop 69	2(0-4)	Blacksmithing II Shop 72	2(0-4)
Elementary Farm Machinery Agric. Engr. 51	2(1-2)		

THIRD YEAR

First Semester		Second Semester	
Elementary Farm Management Ag. Ec. 51	3(2-2)	Elementary Agricultural Economics Ag. Ec. 56	3(3-0)
Physics A-I Physics 51	4(3-2)	Physics A-II Physics 52	4(3-2)
English V Engl. 72	4(4-0)	Civics Hist. 63	4(4-0)*or*
American Nation I Hist. 59	4(4-0)	American Nation II Hist. 60	4(4-0)
		Farm Writing Ind. Jour. 51	4(2-4)
Physical Training M-I Phys. Ed. 51A	1(0-3)*or*	Physical Training M-II Phys. Ed. 52	1(0-3)*or*
Infantry I† Mil. Tr. 101	1(0-4)	Infantry II† Mil. Tr. 102	1(0-4)
Music*		Music*	
Elective, 5 credits from the following:		*Elective*, 5 credits from the following:	
Plane Geometry I Math. 66	4(4-0)	Plane Geometry II Math. 67	4(4-0)
Diseases of Farm Animals Surg. 51	2(2-0)	Physiology and Hygiene Anat. 51	4(4-0)
Elementary Grain Marketing Mill. Ind. 52	3(2-2)		
El. Farm Sanitation and Water Supply Agric. Engr. 73	2(2-0)	Elementary Bacteriology Bact. 52	3(2-2)
Automechanics I Shop 95	3(1-4)	Elementary Traction Engines II Agric. Engr. 69	3(1-4)

Curriculum for Mechanics

(The Vocational School)

The Arabic numeral immediately following the name of subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

FIRST YEAR

First Semester		Second Semester	
English I Engl. 51	4(4-0)	English II Engl. 54	4(4-0)
Algebra I Math. 63	4(4-0)	Algebra II Math. 64	4(4-0)
Freehand and Object Drawing Arch. 52	2(0-4)	Elementary Mechanical Drawing Ap. Mech. 73	2(0-4)
Farm Gas Engines I Agric. Engr. 76	3(1-4)	Elementary Traction Engineering I Agric. Engr. 67	3(1-4)
Carpentry I Shop 51	2(0-4)	Elementary Botany Bot. 51	3(2-2)
Concrete Construction I Ap. Mech. 51, 55	2(1-2)		
Blacksmithing I Shop 69	2(0-4)	Blacksmithing II Shop 72	2(0-4)
Physical Training M-I Physical Ed. 51A	1(0-3)	Physical Training M-II Phys. Ed. 52	1(0-3)
Music*		Music*	

* Elective.

† All male students are required to take Physical Training during the first year of their attendance and Military Training during the next year.

SECOND YEAR

First Semester		Second Semester	
English III Engl. 61	4(4-0)	English IV Engl. 64	4(4-0)
Plane Geometry I Math. 66	4(4-0)	Plane Geometry II Math. 67	4(4-0)
Physics A-I Physics 51	4(3-2)	Physics A-II Physics 52	4(3-2)
Shop Drawing I Ap. Mech. 80	2(0-4)	Shop Drawing II Ap. Mech. 90	2(0-4)
Machine Shop I Shop 88	2(0-4)		
Infantry I † Mil. Tr. 101	1(0-4)	Infantry II † Mil. Tr. 102	1(0-4) *or*
Physical Training M-I Physical Ed. 51A	1(0-3)	Physical Training M-II Phys. Ed. 52	1(0-3)
Elective, 3 credits from following:		*Elective,* 5 credits from following:	
Carpentry II Shop 54	3(0-6)	Carpentry III Shop 57	3(0-6)
Automechanics I Shop 95	3(1-4)	Automechanics II Shop 97	3(1-4)
Farm Gas Engines II Agric. Engr. 78	3(1-4)	Machine Shop II Shop 90	2(0-4)
		Elementary Traction Engines II Agric. Engr. 70	3(1-4)

THIRD YEAR

First Semester		Second Semester	
Modern History I† Hist. 55	4(4-0)	Modern History II† Hist. 56	4(4-0)
Solid Geometry Math. 71	4(4-0)	Algebra III Math. 72	4(4-0)
Civics Hist. 63	4(4-0)	Economics Econ. 52	4(4-0)
English V Engl. 72	4(4-0)	English VI Engl. 74	4(4-0)
Infantry I‡ Mil. Tr. 101	1(0-4)*or*	Infantry II‡ Mil. Tr. 102	1(0-4)*or*
Physical Training M-I Phys. Ed. 51A	1(0-3)	Physical Training M-II Phys. Ed. 52	1(0-3)
Elective, 3 credits from following:		*Elective,* 3 credits from following:	
Carpentry IV Shop 60	2(0-4)	Machine Shop III Shop 93	3(0-6)
Shop Drawing III Ap. Mech. 96	3(0-6)	Carpentry V Shop 64	3(0-6)

† Ancient History I and II or American Nation I and II may be substituted for Modern History I and II.

‡ All male students are required to take Physical Training during the first year of their attendance and Military Science during the next year.

Curriculum in Home Economics

(THE VOCATIONAL SCHOOL)

The Arabic numeral immediately following the name of subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
Elementary Food Study I Food and Nut. 55	3(1-4)	Elementary Food Study II Food and Nut. 56	3(1-4)
Garment Making I Clo. and Text. 57	3(1-4)	Garment Making II Clo. and Text. 58	3(1-4)
General Science HE Bot. 52	4(2-4)	Elementary Design Ap. Art 51	3(0-6)
English I Engl. 51	4(4-0)	English II Engl. 54	4(4-0)
Industrial Arithmetic W Math. 52	4(4-0)	Algebra I Math. 63	4(4-0) *or*
		Gardening Hort. 56	2(1-2)
		Carpentry H Shop 66	2(0-4)
Physical Training W-I Phys. Ed. 75A	1(0-3)	Physical Training W-II Phys. Ed. 76	1(0-3)
Music*		Music*	

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
Food Problems I Food and Nut. 57	2(0-4)	Food Problems II Food and Nut. 58	4(2-4)
Clothing Problems and Design Clo. and Text. 59	4(2-4)	Home Management Hshld. Econ. 63	3(2-2)
Elementary Chemistry Chem. 51	4(3-2)	Elementary Household Chemistry Chem. 52	4(3-2)
English III Engl. 61	4(4-0)	English IV Engl. 64	4(4-0)
Elements of Poultry Keeping Poult. Husb. 53	1(1-0)		
Economics Econ. 52	4(4-0)	Civics Hist. 63	4(4-0)
Physical Training W-I *or* W-III Phys. Ed. 75A *or* 77	1(0-3)	Physical Training W-II *or* W-IV Phys. Ed. 76 *or* 78	1(0-3)
Music*		Music*	

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
Home Sanitation Hshld. Econ. 64	3(2-2)	House Planning and Furnishing Ap. Art. 56	4(1-6)
Dressmaking and Millinery Clo. and Text. 60	3(0-6)	Child Care and Home Nursing Hshld. Econ. 65	3(2-2)
Physiology and Hygiene Anat. 51	4(4-0) *or*	Elementary Bacteriology Bact. 52	3(2-2) *or*
Physics H-I Physics 61	4(3-2)	Physics H-II Physics 62	4(3-2)
English V Engl. 72	4(4-0)	English VI Engl. 74	4(4-0)
Ancient History I† Hist. 51	4(4-0)	Ancient History II† Hist. 52	4(4-0)
Physical Training W-I *or* W-III Phys. Ed. 75A *or* 77	1(0-3)	Physical Training W-II *or* W-IV Phys. Ed. 76 *or* 78	1(0-3)
Music*		Music*	

* Elective.

† American Nation I and II or Modern History I and II may be substituted for the corresponding terms of Ancient History.

Agricultural Courses

AGRICULTURAL ECONOMICS

51. ELEMENTARY FARM MANAGEMENT. Third year, first semester. Class work, two hours; laboratory, two hours. Three semester credits. Prerequisites: Farm Crops, Soils and Fertilizers, and Live-stock Production. Mr. Evans.

The economic factors affecting the organization and operation of the farm business are studied with respect to their effect on the profits from farming enterprise. Crop rotations for Kansas and their effect upon soil productivity receive considerable attention. The advantage of keeping a simple and practical system of accounts is discussed and students are given actual practice work in keeping a system of accounts. Legal papers with which the farmer should have a working knowledge, such as deeds, mortgages, leases and negotiable instruments, receive consideration. Results from actual farms are studied in the laboratory to give the student opportunity to observe the effects of the various economic factors in their influence on the farm business.

56. ELEMENTARY AGRICULTURAL ECONOMICS. Third year, second semester. Class work, three hours. Three semester credits. Prerequisites: Agron. 51 and 56; An. Husb. 55. Mr. Evans.

The course presents the more important principles pertaining to the business side of farming. Farm organization, the characteristics of the factors of production and the intensity culture are followed by a study of farm tenancy, the forces determining the value of agricultural products, and the problems of marketing. Finally profits of farmers in relation to their efficiency and their ability to purchase land are discussed. The course is conducted by lectures, texts, and supplementary reading. Texts: Carver's *Principles of Rural Economics;* and Ely and Wicker's *Elementary Principles of Economics.*

AGRONOMY

51. FARM CROPS. Second year, first semester. Class work, four hours; laboratory, two hours. Five semester credits. Prerequisite: Elementary Botany. Assistant Professor Davidson.

The course involves a study of both grain and forage crops, approximately one-half semester being given to each. Emphasis is placed upon the economic production of those crops which are of greatest importance in Kansas. The laboratory work is planned to acquaint the student with the different grain and forage plants and their habits of growing. Text: Wilson and Warburton's *Field Crops.*

56. SOILS AND FERTILIZERS. Second year, second semester. Class work, two hours; laboratory, two hours. Three semester credits. Prerequisites: Elementary Chemistry; Farm Crops. Assistant Professor Davidson.

The course involves a study of the physical nature of soils and their adaptation to crops, together with proper methods of handling to maintain good physical condition, to conserve moisture and to prevent washing and blowing. Means of maintaining the fertility of the soil, the care and use of barnyard manure; green manure and commercial fertilizers are also considered. In the laboratory and on field trips different soils are studied with reference to their physical properties and their relation to crops and methods of management. Text: Whitson and Walster's *Soils and Fertilizers.*

ANIMAL HUSBANDRY

51. STOCK JUDGING I. First year, first semester. Laboratory, six hours. Three semester credits. Assistant Professor Aubel.

This course consists in score-card practice in judging horses, beef cattle, dairy cattle, sheep, and swine. By means of this practice the students become familiar with the general points to be observed in judging market types and

classes of live stock. One-fourth of this time is given to the study of dairy cattle, which instruction is given in the Department of Dairy Husbandry. Text: Craig's *Judging Live Stock.*

52. STOCK JUDGING II. First year, second semester. Laboratory, six hours. Three semester credits. Mr. Horlacher.

This course consists of a study of the breeding types and classes of horses, cattle, sheep, and swine, with practice in scoring and judging breeding animals.

53. BREEDS AND BREEDING. First year, second semester. Class work, two hours. Two semester credits. Prerequisite: Stock Judging I. Assistant Professor Aubel.

This course consists of a study of pure-bred horses, cattle, sheep, and swine, and the methods practiced by the best breeders. It also embraces the study of the general principles of breeding, such as variation and heredity. Text: Mumford's *Breeding of Farm Animals.*

54. FEEDS AND FEEDING. Second year, first semester. Class work, two hours. Two semester credits. Professor Paterson.

This course consists of a comparative study of the various feeds as to their usefulness and their relation to successful and economical feeding of live stock. It involves a study of the digestive system and the processes of nutrition, and a study of the origin, nature, grades, and value of the various by-products that are used in feeding operations. Text: Henry and Morrison's *Feeds and Feeding,* abridged edition.

55. LIVE-STOCK PRODUCTION. Second year, second semester. Class work, three hours. Three semester credits. Prerequisites: Stock Judging I and II. Professor Paterson.

This course involves a study of successful and economical methods of growing and finishing cattle, sheep, and hogs for market purposes, as well as the breeding of both market and pure-bred animals. Lectures, supplemented by agricultural newspaper work and Experiment Station records.

DAIRY HUSBANDRY

61. DAIRYING. Second year, first semester. Lectures, one hour; laboratory, two hours. Two semester credits. Mr. Becker.

This course includes lectures on the various breeds of dairy cattle, milk and its composition, Babcock testing, separation, and churning. Two individual lectures are given to the agricultural students on feeding the dairy herd, and two additional lectures on cheese making to the home-economics students.

Laboratory.—The laboratory work comprises the operation of the Babcock test, separating milk, churning, and soft-cheese making.

62. STOCK JUDGING I. (An. Husb. 51.) Associate Professor Cave.

Four weeks are given over to the judging of dairy cattle. The rest of the course is devoted to the study of the breeding and market types of horses, cattle, sheep, and swine, and is presented by the Department of Animal Husbandry.

HORTICULTURE

51. FRUIT GROWING. First year, second semester. Class work, two hours; laboratory, two hours. Three semester credits. Assistant Professor Pickett.

This course consists of a study of some of the problems of the fruit grower. Orchard soils, choice of varieties, planting, care of orchards, insects and diseases, and methods of their control; cultivation, harvesting, and the propagation of fruit plants, are some of the most important topics studied.

Laboratory.—Actual work is given in pruning, spraying, and the study of orchard conditions, examination of orchard soils, and the propagation of fruit plants.

56. GARDENING. First year, second semester. Class work, one hour; laboratory, two hours. Two semester credits. Mr. Balch.

The practices and principles involved in the planning, cultivation, and care of the home or kitchen gardens are here studied.

MILLING INDUSTRY

52. ELEMENTARY GRAIN MARKETING. Third year, first semester. Class work, two hours; laboratory, two hours. Three semester credits. Professor Fitz.

This course includes the study of methods of handling and storing grain, together with the marketing of surplus grain from the farm. It involves study of the method of selling or buying, shipping and grading grain; organization of grain-inspection departments, with their merits and defects; the principal grain markets, with receipts and shipments of grain. The laboratory work consists of practice in sampling bulk grain and in examining and grading different kinds and types of such grain. A brief study is also made of the by-products resulting from the manufacture of food products and their comparative costs.

POULTRY HUSBANDRY

51. BEGINNING POULTRY. First year, first semester. Class work, one hour; laboratory, two hours. Two semester credits. Mr. Fox.

This course takes up a discussion of the various operations that go to make up the art of poultry keeping.

Laboratory.—The laboratory study includes work in dressing, packing, and caponizing.

53. ELEMENTS OF POULTRY KEEPING. Second year, first semester. Class-work, one hour. One semester credit. Professor Lippincott and Mr. Fox.

This course covers the same ground as Beginning Poultry, except that no laboratory work is required.

Veterinary Medicine and Physiology Courses

ANATOMY AND PHYSIOLOGY

51. PHYSIOLOGY AND HYGIENE. Third year, first and second semesters. Class work, four hours. Four semester credits. Doctor Shuler.

Sufficient consideration is given to the anatomy or structure of the body to enable the student to understand more fully the functions of the proper parts. The normal functions of the various organs of the body are studied. The importance of the normal functioning of the body for the prevention of diseases, and also diseases that may arise from improper performance of the various organs, are discussed. Text: Ritchie's *Sanitation and Physiology*.

SURGERY AND MEDICINE

51. DISEASES OF FARM ANIMALS. Third year, first semester. Class work, two hours. Two semester credits. Doctor Frick.

This course is intended to teach the student the recognition of disease, the principles involved in the preservation of health, and the application of first aid in disease or accident of farm animals. The various diseases resulting from the use of spoiled foods, or the improper or injudicious use of good foods, are discussed. The value of food, care, and the nursing of the sick animal is thoroughly impressed upon the student. The common infectious diseases and the means of their prevention and eradication are considered. Text: Craig's *Common Diseases of Farm Animals*.

General Science Courses

BACTERIOLOGY

52. ELEMENTARY BACTERIOLOGY. Third year, second semester. Lectures, two hours; laboratory, two hours. Three semester credits. Prerequisite: Chemistry, one year. Mr. Baker.

This is an elementary course in the principles of bacteriology. Bacteriological problems are considered from an entirely practical standpoint. The course is offered in order to give the student a reading knowledge of the sources and modes of infection; the relation of bacteriology to dairying and to soils and crop production; general sanitation; fermentations, etc. It includes a discussion of microörganisms as related to air, water, and foods.

Laboratory.—Various microscopic forms of importance in fermentation; preservation and spoilage of foods; the influence of various preservatives upon microörganisms common in the home; methods of sterilization and of pasteurization; the handling of infectious material; normal and abnormal fermentations of milk and milk products; quantitative study of bacteria in the soil; a limited study of pathogenic bacteria, of sewage pollution of water, etc., comprise the laboratory work.

BOTANY

51. ELEMENTARY BOTANY. First year, second semester. Class work, two hours; laboratory, two hours. Three semester credits. Miss Cashen.

This course involves an elementary study of the biology of plants, including the simpler facts of their structure, physiology, and classification. The structure and work of the root, stem, and leaf systems and the life history of a seed plant from its germination to its maturity are studied. Attention is given to the function of the flower and its adaptations to insect and wind pollination and to the manner in which seeds and fruits are distributed. Field trips enable emphasis throughout the course on the relations of plants to light, air, water, and soil. Some of the plants of economic importance are studied in the field. Emphasis is laid on the relation of the biology of plants to agricultural practice.

52. GENERAL SCIENCE HE. First year, second semester. Recitation, two hours; laboratory, four hours. Four semester credits. Miss Trail.

This course deals with problems of elementary science as related to home-economics work. The major part of the work is a study of plants such as molds, bacteria, plant tissues, and the storage of foods in plants. Some time is given to a study of physical and chemical problems of an elementary nature. The problems studied are chosen because of their relation to the work of the household.

CHEMISTRY

51. ELEMENTARY CHEMISTRY. Second year, first semester. Lectures and recitations, three hours; laboratory, two hours. Four semester credits. Mr. Watkins.

The work this term is an elementary study of the general principles of chemistry, using the elements oxygen, hydrogen, nitrogen, chlorine, and carbon, and their most important compounds, as its basis. Sulphur and phosphorus, and to a slight extent other nonmetals, are studied, and following this a study of the metals and their most important compounds is begun. So far as possible, illustrations are drawn from practical life on the farm and in the home. The laboratory work is designed to give the student some knowledge of the essential features of chemical change, as well as to familiarize him with some of the more important elements and chemical compounds. Textbook: McPherson and Henderson's *First Course in Chemistry*.

52. ELEMENTARY HOUSEHOLD CHEMISTRY. Second year, second semester. Lectures and recitations, three hours; laboratory, two hours. Four semester credits. Prerequisite: Elementary Chemistry. Mr. Watkins.

In the work of this term the study of the metals is completed, and chemistry is then studied in its more direct application to the household. The course includes not only some special applications of inorganic chemistry, but simple organic chemistry, especially in its relation to foods. The laboratory work is an application of chemistry to various household problems touching water, foods, textiles, and utensils. Textbook: Snyder's *Chemistry of Plant and Animal Life.*

53. ELEMENTARY AGRICULTURAL CHEMISTRY. Second year, second semester. Lectures and recitations, three hours; laboratory, two hours. Four semester credits. Prerequisite: Elementary Chemistry. Mr. Watkins.

The study of the metals, begun the previous semester, is first completed. The chemical composition and chemistry of the growth of plants and animals are then taken up, and the general principles of chemistry are presented as applicable on the farm in relation to soils, fertilizers, dairy products, feeds, water, etc. The laboratory work follows these lines and is made as practical as possible. Textbook: Snyder's *Chemistry of Plant and Animal Life.*

ECONOMICS

52. ECONOMICS. Second or third year, both semesters. Class work, four hours. Four semester credits. Professor Burr.

This course is a study of fundamental principles underlying man's wealth-getting and wealth-using activities, and their application to conditions and problems of the industries of to-day. Instruction is based on a text, assigned readings, and reports.

ENGLISH

51. ENGLISH I. First year, first semester. Class work, four hours. Four semester credits. Miss Aberle, Miss Bogue.

This course has a twofold purpose: to give instruction in the elementary principles of composition, and to develop an interest in the reading of good literature. For the first aim the text, *Composition and Rhetoric,* by Genung and Hansen, Parts I and II, is used. This work includes a review of grammar, the development of a vocabulary, the use of the dictionary, and a study of the simpler forms of the whole composition and the paragraph. For the second aim, outside readings are required as follows: Elbert Hubbard, *A Message to Garcia;* John Burroughs, *Birds and Bees;* George Eliot, *Silas Marner.* Readings from these selections are given in class and class discussions are encouraged.

54. ENGLISH II. First year, second semester. Class work, four hours. Four semester credits. Miss Bogue, Miss Aberle.

This course is a continuation of English I. It covers Part III of the text used in English I. Letter writing is emphasized and practice in elementary debate is required. In addition to the text, *Modern Short Stories,* by Frederick H. Law, is studied. In the latter work written summaries and the oral retelling of stories are required.

61. ENGLISH III. Second year, first semester. Class work, four hours. Four semester credits. Miss Aberle, Miss Bogue, and Miss Rushfeldt.

The work of this course consists of a study of American literature. Class readings, class discussions, written sketches, abstracts, book reviews, and outlines are required. The aim of the course is to familiarize the student with the masterpieces of his own countrymen. Texts: Long's *History of American Literature; Three Centuries of American Poetry and Prose,* by Newcomber, Andrews, and Hall; and Cooper's *Last of the Mohicans.* This term's work covers the text as far as chapter IV in Long's *History of American Literature.*

64. ENGLISH IV. Second year, second semester. Class work, four hours. Four semester credits. Assistant Professor Russel and Miss Aberle.

This course is a continuation of the work in English III, completing the work of the text. Similar work is required as in English III. In addition to Long's *History of American Literature* and Newcomber's *Three Centuries of American Poetry and Prose,* Howell's *Rise of Silas Lapham* is required.

71. ENGLISH V. Third year, first semester. Class work, four hours. Four semester credits. Assistant Professor Russel, Miss Aberle, and Miss Rushfeldt.

This is a course in commercial usage. It includes a study of the principles governing the whole composition, applying these principles especially to letter writing. Oral compositions in the form of sales talks and incidents relating to business are required. Text: Davis and Lingham, *Business English and Correspondence.*

74. ENGLISH VI. Third year, second semester. Class work, four hours. Four semester credits. Associate Professor Rice and Miss Rushfeldt.

This is a course in English classics. It includes an intensive study of representative classics. Abstracts, outlines, paraphrases and original themes are required. Texts: Shakespeare's *Merchant of Venice* and *Julius Cæsar,* Milton's *Shorter Poems,* Burns' *Representative Poems,* Coleridge's *Ancient Mariner,* Tennyson's *Selected Poems,* and Dickens' *Tale of Two Cities.*

ENTOMOLOGY

61. FARM INSECTS. First year, second semester. Class work, two hours; laboratory, two hours. Three semester credits. Associate Entomologist McColloch.

This is a study of the elementary anatomy, structure, and physiology of insects, complete enough to give clear understanding of the general structure of insects and the underlying facts upon which the scientific application of remedial or preventive measures is based. All of the more important insects of the farm, garden, and orchard are discussed at sufficient length to give a clear idea of their life histories and habits, together with the best means of control. The class work consists of lectures and text.

Laboratory.—The laboratory work is designed to acquaint the student with the more common injurious insects found on the farm. The preparation and use of various sprays, poisons, baits, and fumigants are also taken up.

65. ELEMENTARY BEEKEEPING. Third year, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Farm Insects. Associate Professor Merrill.

This course comprises a general study of the structure, life history, general behavior, activities, and products of the honeybee. Special attention is given to practical beekeeping. A study is made of bee diseases and of the standard methods to be used in their eradication and control.

HISTORY AND CIVICS

51, 52. ANCIENT HISTORY I AND II. Third year, first and second semesters, respectively. Class work, four hours. Four semester credits for each course, Miss Orem and Mr. Rice.

Beginning with a study of civilization in the Nile and Tigris-Euphrates valleys, the first semester's work includes a study of Greece and Rome to the time of the Roman empire. The second semester's work takes up the fall of Rome, the medieval period, and the dawning of the new age up to the seventeenth century. In addition to the greater political events, special attention is given to the institutional life of this period, to the social, economic, and intellectual forces at work in the different states, as well as to the development of their governmental organization. Text: Robinson and Breasted's *Ancient and Medieval History.*

55, 56. MODERN HISTORY I AND II. Third year, first and second semesters, respectively. Class work, four hours. Four semester credits for each course. Miss Orem and Mr. Rice.

This consists of the development of Europe from the seventeenth century to the present time. In view of the fact that greater changes have taken place in Europe since 1789 than in the thousand years preceding, special attention is given to the social and economic developments of this period. The development of the nations into world powers and their relations with the Americas and the Far East is emphasized; also the changes which prepared the way for the Great War and the resulting European situation. Text: *A General History of Europe,* by Robinson, Breasted and Smith.

59, 60. AMERICAN NATION I AND II. Third year, first and second semesters, respectively. Class work, four hours. Four semester credits for each course. Miss Orem and Mr. Rice.

This course consists of a survey of American history from the discovery of America to the present time. It deals with the establishment of the English colonies in America; the growth of social and political institutions in these colonies; the development of an American nationality; the struggle among European nations for the possession of North America; the causes and meaning of the American Revolution; the formation and establishment of the constitution; the rise of the West and its influence, socially, politically, and economically; the growth of sectionalism, the secession movement and the struggle to preserve the Union; and the important events characterizing American history since the termination of the contest between the North and the South. Along with the political history of the United States, a study of its economic development is made for the purpose of understanding the steps by which America, from humble beginnings in the colonial period, has reached its present high position as an industrial state. Texts: West's *History of the American People,* and Bogart's *The Economic History of the United States.*

63. CIVICS. Second and third years, both semesters. Class work, four hours. Four semester credits. Miss Orem and Mr. Rice.

This is not a course of the old type, usually called civil government, nor a course in constitutional law, but a vigorous course in the actual workings of our present-day governmental and political activities. Text: Guitteau's *Government and Politics in the United States,* Kansas edition.

INDUSTRIAL JOURNALISM AND PRINTING

51. FARM WRITING. Third year, second semester. Class work, two hours; laboratory, four hours. Four semester credits. Associate Professor Rogers.

The course treats of the elementary principles of writing for newspapers and farm publications, on such subjects as the students are likely to encounter in practical life. The student is shown how to obtain effective publicity for worthy enterprises in which he may be engaged. Emphasis is laid on agriculture, rural life, and general community service.

MATHEMATICS

51. INDUSTRIAL ARITHMETIC A. First year, first semester. Class work, four hours. Four semester credits. Assistant Professor McKittrick and Miss Holroyd.

The course has two distinct aims: (1) A practical knowledge of the principles of numbers, both integral and fractional; and (2) the application of these principles to practical problems of the farm and shop. A large number of problems arising from actual experience over the whole field of agricultural science are made the basis of the problem work. Farm investments, farm accounts, and farm values receive special attention. Text: Stratton and Remick's *Agricultural Arithmetic.*

52. INDUSTRIAL ARITHMETIC W. First year, first semester. Class work, four hours. Four semester credits. Assistant Professor McKittrick and Miss Holroyd.

This course follows the lines of Industrial Arithmetic A, except that the points of emphasis are varied so as to meet the needs of young women. Text: Same as for the course above.

63. ALGEBRA I. First year, both semesters. Class work, four hours. Four semester credits. Assistant Professor McKittrick, Miss Holroyd, and Mr. Edgerton.

This course includes a study of simple algebraic expressions and the use of the equation; a treatment of the methods of finding distances by means of scale drawings, similar triangles, and elementary trigonometric functions; a discussion of the various uses of graphs and of positive and negative numbers. Text: Wells and Hart's *New High-school Algebra.*

64. ALGEBRA II. First and second years, both semesters. Class work, four hours. Four semester credits. Prerequisite: Algebra I. Assistant Professor McKittrick, Miss Holroyd, and Mr. Edgerton.

The chief topics considered are solution of simultaneous equations, both graphically and algebraically, factoring, fractions and fractional equations, square roots, radicals, and an introduction to quadratic equations. Text: Wells and Hart's *New High-school Algebra.*

66. PLANE GEOMETRY I. Second and third years, first semester. Class work, four hours. Four semester credits. Prerequisite: Algebra II. Assistant Professor Hyde, Miss Holroyd, and Mr. Edgerton.

Books I and II of Wentworth and Smith's *Plane and Solid Geometry* are studied in this course.

67. PLANE GEOMETRY II. Second and third years, second semester. Class work, four hours. Four semester credits. Prerequisite: Plane Geometry I. Assistant Professors Hyde and Lewis, and Mr. Edgerton.

Books III, IV, and V of Wentworth and Smith's *Plane and Solid Geometry* are included in this course.

71. SOLID GEOMETRY. Third year, first semester. Class work, four hours. Four semester credits. Prerequisite: Plane Geometry II. Assistant Professors McKittrick and Lewis, Miss Holroyd, and Mr. Edgerton.

Books VI, VII, and VIII of Wentworth and Smith's *Plane and Solid Geometry* form the subject matter of this course.

72. ALGEBRA III. Third year, second semester. Class work, four hours. Four semester credits. Prerequisite: Algebra II. Assistant Professors McKittrick and Hyde, and Miss Holroyd.

This course includes, besides a rapid review of factoring, fractions, linear equations, roots, radicals, and exponents, a treatment of quadratic forms with graphical work and theory, ratio and proportion, variation, the progressions, and the binomial theorem for positive integral exponents. Text: Wells and Hart's *Second Course in Algebra.*

MILITARY TRAINING

All young men are required to take military training during their second year of attendance in the Vocational School. Their work in this branch is identical, so far as it goes, with that of the men in the College corps of cadets. The following work is taken:

101. INFANTRY I. Lectures, recitations, and military drill, four hours a week. One semester credit.

The work of this course is divided as follows:

(*a*) *Practical.* Physical drill; infantry drill; school of the soldier, squad and company in close and extended order; preliminary instruction, sighting, position, and aiming drills, gallery practice, nomenclature, and care of rifle and equipment.

(*b*) *Theoretical.* Theory of target practice; individual and collective; military organization; map reading; service of security; personal hygiene.

102. INFANTRY II. Lectures, recitations, and military drill, four hours a week. One semester credit. Prerequisite: Infantry I.

The work of this course is divided as follows:

(*a*) *Practical.* Physical drill; infantry drill; school of the battalion; cere-

monies; manuals; bayonet combat; entrenchment; first-aid instruction; range and gallery practice.

(*b*) *Theoretical.* Lectures on military policy as shown by military history of the United States, and military obligation of citizenship; service of information; combat; Infantry Drill Regulations, to include the school of the company; camp sanitation for small commands.

MUSIC

Music is offered as an elective for both young women and young men. Instruction is furnished free to all regular students assigned to music classes, but for individual instruction a fee is charged. Further particulars are given in the article on "Music," elsewhere in this catalogue.

PHYSICAL EDUCATION

MEN'S DEPARTMENT

51A. PHYSICAL TRAINING M-I. First semester. Two hours. One semester credit. Required of all young men during their first semester in the school. Assistant Professor Knoth.

The course includes elementary free-hand calisthenics; elementary light hand apparatus, including wands, dumb-bells, etc.; elementary heavy apparatus work, and games. All work is graded in progressive order for each semester. Swimming is taught in the spring. A physical examination is made of each student when he enters. During the fall rugby football and soccer football are given. From the first of December to the end of the semester the work is in the gymnasium. Elementary calisthenics and Swedish movements, elementary apparatus, and games are taught.

Hygiene and social problems are discussed. This instruction gives an insight into the practical problems of daily healthful living from a personal point of view. Directions are given for avoiding the common ills of student life, and for maintaining the highest physical and mental condition while in the school, as well as for gaining the highest development of vital power and health for future duties.

52. PHYSICAL TRAINING M-II. Second semester. Two hours. One semester credit. Required of all young men during their second semester in the school. Assistant Professor Knoth.

This course is a continuation of Physical Training M-I. In the spring, as soon as weather conditions allow, the work consists of baseball and track and field athletics.

WOMEN'S DEPARTMENT

75A, 76. PHYSICAL TRAINING W-I AND W-II. First and second semesters, respectively. Three hours. One semester credit for each course. Assistant Professor Tausche and Dean Van Zile.

This is an introductory course. It includes corrective exercises, light apparatus work, folk dancing, games, and swimming. A physical examination is made of each young woman before she enters upon the work.

Instruction in hygiene and social problems is an essential part of course 75A. In these lectures, which are given by Mary P. Van Zile, dean of women, in addition to the problems of hygiene as applied to individual health, the biological truths that lead to serious, respectful consideration of social and sex hygiene are presented.

77, 78. PHYSICAL TRAINING W-III AND W-IV. First and second semesters, respectively. Three hours. One semester credit for each course. Assistant Professor Tausche.

These courses are a continuation of Physical Training W-I and W-II. Esthetic dancing, Swedish gymnastics, games, and swimming are taught in these courses.

PHYSICS

51. PHYSICS A-I. Second or third year, first semester. Class work, three hours; laboratory, two hours. Four semester credits. Assistant Professors Hartel and Cook, and Miss Taylor.

The fundamental laws of mechanics, heat and sound are presented in this course. The application of principles to the common things of everyday life is emphasized. The laboratory work is based upon the work done in class, and is outlined in such a manner as to give the students special drill in exact measurements. Text: Carhart and Chute's *Practical Physics.*

52. PHYSICS A-II. Second or third year, second semester. Class work, three hours; laboratory, two hours. Four semester credits. Prerequisite: Physics A-I. Assistant Professors Hartel and Cook, and Miss Taylor.

This course is a continuation of Physics A-I. The subjects of magnetism, electricity, and light are considered. An introductory study is made of the units used in measuring electrical energy, the principles involved in current distribution, the uses now being made of electricity, the ordinary phenomena of light, and questions of modern illumination. Text: Carhart and Chute's *Practical Physics.*

61. PHYSICS H-I. Third year, first semester. Class work, three hours; laboratory, two hours. Four semester credits. Assistant Professor Converse and Miss Taylor.

The work given in this course has a direct bearing on the principles of mechanics, sound and heat as they apply to the home. The laboratory work is especially adapted to this phase of the work. Text: Tower, Smith and Turton's *Physics.*

62. PHYSICS H-II. Third year, second semester. Class work, three hours; laboratory, two hours. Four semester credits. Prerequisite: Physics H-I. Assistant Professor Converse and Miss Taylor.

This course is a continuation of Physics H-I. The fundamental principles and laws of electricity and light are presented in this course, with special applications of the use of electricity in the home. Laboratory work is based on the study of simple electrical appliances used in the home. Text: Tower, Smith and Turton's *Physics.*

Courses for Mechanics

AGRICULTURAL ENGINEERING

51. ELEMENTARY FARM MACHINERY. Second year, first semester. Class work, one hour; laboratory, two hours. Two semester credits. Assistant Professor Driftmier.

In this course the student is taught the principles underlying the construction, operation, and adjustment of the different types of farm machinery. Instruction is also given in rope work and belt splicing. Proper adjustment and operation of the machine is taught in the laboratory and in the field. Text: Davidson's *Agricultural Engineering.*

67. ELEMENTARY TRACTION ENGINES I. Second year, second semester. Class work, one hour; laboratory, four hours. Three semester credits. Prerequisite: Farm Gas Engines I (Agric. Engr. 76). Assistant Professor Driftmier.

A study is made of gas traction engines, including motors, frames, transmission systems, cooling systems, lubricating systems, and carburetors, and the operation, care, repair and testing of gas traction engines. Text: Page's *Modern Gas Tractor.*

70. ELEMENTARY TRACTION ENGINES II. Third year, second semester. Class work, one hour; laboratory, four hours. Three semester credits. Prerequisite: Elementary Traction Engines I (Agric. Engr. 67). Associate Professor Sanders.

Practice is given in the operation, care and testing of various types of gasoline and kerosene traction engines, including belt, road, and field tests. Text: Page's *Modern Gas Tractor.*

73. ELEMENTARY FARM SANITATION AND WATER SUPPLY. Elective, first semester. Class work, two hours. Two semester credits. No prerequisite. Professor Walker.

Sources of water supply, farm water systems, ponds, cisterns, plumbing and farm sanitation are studied in this course. No text is used, the instruction being given by lectures, bulletins, and library references.

76. FARM GAS ENGINES I. First year, both semesters. Class work, one hour; laboratory, four hours. Three semester credits. Assistant Professor Driftmier.

A study is made of gasoline and kerosene engines, four-stroke and two-stroke cycle engines, gas-engine fuels, carburetors, ignition systems, lubrication, governing; also the selection, erection and operation of stationary gasoline and kerosene engines, and the fundamental parts of automobiles. Text: Potter's *Farm Motors.*

78. FARM GAS ENGINES II. Second year, first semester. Class work, one hour; laboratory, four hours. Three semester credits. Prerequisite: Farm Gas Engines I (Ag. Engr. 76). Associate Professor Sanders.

A detailed study is made of gas-engine operation and care, with special attention to ignition systems, carburetors, and testing. Automobile parts, including engines, differentials, transmissions, lubricating systems, clutches, systems of ignition, starters, and carburetors are also studied. Texts: Potter's *Farm Motors,* Frazer and Jones' *Motor Vehicles.*

APPLIED MECHANICS

51. CONCRETE CONSTRUCTION I RECITATION. First year, both semesters. Lectures and recitations, one hour. One semester credit. Assistant Professors Robert and Dawley.

Instruction is given in the principles governing the selection and preparation of materials, the proper proportioning of materials for different conditions, the construction of forms, mixing and handling concrete, elementary reinforced concrete construction, finishing concrete surfaces, stucco and plaster work, and waterproofing and coloring concrete. A brief study is made of the application of these principles to the making of concrete foundations, building blocks and bricks, posts, sidewalks, floors, tanks, cisterns, silos, bridges, and culverts. Text: Seaton's *Concrete Construction for Rural Communities.*

55. CONCRETE CONSTRUCTION I LABORATORY. First year, both semesters. Laboratory work, two hours. One semester credit. Must accompany or follow Concrete Construction I Recitation (Ap. Mech. 51). Assistant Professors Robert and Dawley.

Laboratory and field work is given in hand and machine mixing and handling of concrete, and in the construction of forms for such objects as machine and building foundations, floors, sidewalks, fence posts, and building blocks. Tests are made on concrete cylinders and beams to illustrate the effect of different methods of treatment on the strength and reliability of plain and reinforced concrete.

73. ELEMENTARY MECHANICAL DRAWING. First year, second semester. Drafting-room practice, four hours. Two semester credits. Mr. Hunt.

This course comprises free-hand lettering, the use of drawing board, T-square and instruments, geometrical constructions, and orthographic pro-

jections and sections of simple objects. Accuracy is emphasized. Text: French and Svenson's *Mechanical Drawing for High Schools.*

80. SHOP DRAWING I LABORATORY. Second year, first semester. Drafting-room practice, four hours. Two semester credits. Mr. Hunt.

Practice is given in lettering, in the construction of orthographic, cabinet, and isometric projections of objects, revolutions, intersections and development of surfaces, sheet-metal drafting and the construction of paper models of sheet-metal problems.

90. SHOP DRAWING II LABORATORY. Second year, second semester. Drafting-room practice, four hours. Two semester credits. Mr. Hunt.

Working drawings are made from plates during the first part of the semester. Later, free-hand sketches are made of simple machine parts, and working drawings are made from these sketches. Practice is given in making tracings and blue prints.

96. SHOP DRAWING III. Third year, second semester. Drafting-room practice, six hours. Three semester credits. Prerequisite: Shop Drawing II (Ap. Mech. 90). Mr. Hunt.

Practice is given in making working drawings from free-hand sketches of machine parts, assembly drawings, and in designing simple machine parts by empirical methods.

ARCHITECTURE

52. FREE-HAND AND OBJECT DRAWING. First year, first semester. Drafting room, four hours. Two semester credits. Mr. Dehner.

The work of this course includes exercises in drawing simple objects; the principles of perspective are studied and illustrated by drawing from geometric solids.

SHOP WORK

51. CARPENTRY I. First year, both semesters. Laboratory, four hours. Two semester credits. Mr. Aiman and Mr. Slater.

This is a course of exercises in constructive carpentry, which are so graded as to give the student the principles of general carpenter work, and training in the proper use of tools and in the reading of drawings and blue prints. Some work is given to bring out the principles of framing and building operations, and practice is given in the use of paints and varnishes as protective coverings for woodwork. Text: Wood and Smith's *Prevocational and Industrial Arts.* Tools: One two-foot rule and one nail set.

54. CARPENTRY II. Second year, first semester. Laboratory, six hours. Three semester credits. Prerequisite: Carpentry I (Shop 51). Mr. Aiman and Mr. Slater.

This course includes exercises in turning cylinders, cones, beads, convex and concave turning, and exercises that will involve the use of all the different turning tools, and turning between centers, on the face-plate, and with hollow chucks. Some of the exercises are: tool handles, dumb-bells, rolling-pins, napkin rings, table legs, porch posts, balusters, built-up and solid newel posts, columns, and rosettes. Text: Griffith's *Woodwork for Secondary Schools.* Tools: Same as for Carpentry I.

57. CARPENTRY III. Second year, second semester. Laboratory, six hours. Three semester credits. Prerequisite: Carpentry II (Shop 54). Mr. Aiman and Mr. Slater.

This course includes a combination of machine and hand work where the material is worked up on the machines and then fitted by hand. Some of the work consists of making plain and fancy casings, plate rails, picture molding, picture frames, and simple pieces of furniture, which are stained, varnished, or otherwise finished. Tools: Same as for Carpentry I.

60. CARPENTRY IV. Third year, first semester. Laboratory, four hours. Two semester credits. Prerequisite: Carpentry III (Shop 57). Mr. Aiman and Mr. Slater.

This course consists of hand work with the rabbet, router, beading and matching planes, and with the dado, plow, and fillister in making window sashes and frames, doors and frames, grooved flooring, door jambs, and molding. Tools: Same as for Carpentry I.

64. CARPENTRY V. Third year, second semester. Laboratory, supplemented by lectures, six hours. Three semester credits. Prerequisite: Carpentry I (Shop 51). Mr. Aiman and Mr. Slater.

The fundamental factors to be taken into consideration in the construction of buildings, as selection of the building site; laying out and squaring the foundation, excavating, types of foundations, form building for concrete, anchoring, placing of the sills, joists, bridging and studding, and bracing, rafter cutting and fitting, are studied in this course. The laboratory work consists of exercises along the lines given above. Text: Griffith's *Carpentry*.

66. CARPENTRY H. First year, second semester. Laboratory, four hours. Two semester credits. For women only. Mr. Aiman and Mr. Slater.

A practical course in woodwork, in which the student makes simple articles, the making of which gives the proper training in the use of tools, and familiarity with the different kinds of woods, stains, varnishes, and paints. Supplementary lectures are given along with the laboratory work in order to bring out the different points more clearly.

69. BLACKSMITHING I. First year, first semester. Laboratory, four hours. Two semester credits. Assistant Professor Lynch and Mr. Granell.

This is a very practical course in the forging operations, such as drawing, upsetting, welding, bending, twisting, and punching, together with instruction in the proper use and care of the fire and tools, and in handling the metals in the forge. Tools required: A two-foot rule, a pair of five-inch outside calipers, a center punch and a ball-pein hammer weighing, with handle, about two pounds.

72. BLACKSMITHING II. First year, second semester. Laboratory, four hours. Two semester credits. Prerequisite: Blacksmithing I (Shop 69). Assistant Professor Lynch and Mr. Granell.

This work consists of the making of such tools as punches, chisels, drills, scrapers, hammers, and other tools that are used in the trade. Tools required: Same as for Blacksmithing I.

88. MACHINE SHOP I. Second year, first semester. Laboratory, four hours. Two semester credits. Assistant Professor Jones and Mr. Bowhay.

Practical machine work in the building and assembling of gas engines and wood lathes. Exercises are given to bring into use the various machines in the shops. Tools required: A four-inch scale, one nine-inch combination square, one pair five-inch outside calipers, one pair five-inch inside calipers, one center drill, and one B. & S. center gage. Text: *The Lathe*, by Burghart.

90. MACHINE SHOP II. Second year, second semester. Laboratory, four hours. Two semester credits. Prerequisite: Machine Shop I (Shop 88). Assistant Professor Jones and Mr. Bowhay.

This course embraces practical work in making repairs on machinery, such as babbitting and fitting bearings, aligning shaftings and pulleys, lacing and fitting belts, and general repair work on engines and other machinery. Tools: Same as for Machine Shop I.

93. MACHINE SHOP III. Third year, second semester. Laboratory, six hours. Three semester credits. Prerequisite: Machine Shop II (Shop 90). Assistant Professor Jones and Mr. Bowhay.

A continuation of the preceding term's work, with work on the milling machines, universal grinder, and screw machines. Tools: Same as for Machine Shop I.

95. AUTOMECHANICS I. Second year, first semester. Class work, one hour. Laboratory, four hours. Three semester credits. Mr. Flagg.

This course consists of a study of the mechanical construction of the car, including the transmission, rear axle, clutches, brakes, steering gear, bearings, frames, and the automobile engine, as well as the lighting, ignition, starting, and generating units. The class work will be supplemented by the laboratory work, which will be closely related. Tools: One pair six-inch combination pliers and one four-inch screw driver.

97. AUTOMECHANICS II. Second year, second semester. Class work, one hour. Laboratory, four hours. Three semester credits. Mr. Flagg.

This is a continuation of Auto Mechanics I, with the addition of work in the repair shop, consisting of valve grinding, gear adjusting, ring fitting, battery work, testing generators, starting motors, coils, etc. Tools: Same as for Automechanics I.

Home Economics Courses

APPLIED ART

51. ELEMENTARY DESIGN. First year, second semester. Laboratory, six hours. Three semester credits. Miss Arnold.

The principles underlying pleasing color combinations, fine proportions, and consistent arrangement of parts are studied. Many exercises are given in selecting from objects of clothing and house furnishings those involving color harmonies, consistent shapes, and orderly arrangement. Original problems are given in the application of these principles.

56. HOUSE PLANNING AND FURNISHING. Third year, second semester. Class work, one hour; laboratory, six hours. Four semester credits. Prerequisite: Elementary Design. Miss Arnold.

Planning of a house, also each room, with regard to convenience and comfort. An adaptation is made to location and needs of the family, sanitation, modern conveniences, etc. Principles of color, form and arrangement are studied in application to all problems involved in home decoration, such as window, door and wall spacings, woodwork, wall coverings and floor coverings; appropriate furniture, and the arrangement of these in different rooms.

CLOTHING AND TEXTILES

57. GARMENT MAKING I. First year, first semester. Recitation, one hour; laboratory, four hours. Three semester credits. Miss Polson.

In this course and the following, practice is given in the fundamental stitches and in the use of the sewing machine and of commercial patterns in the making of undergarments. A study is made of the characteristics of cotton fiber and cotton goods suitable for underwear, and practice is given in identifying the various kinds and qualities of cotton goods on the market. In the selection of the material, trimming and style of the garments which are made, attention is given to cost, durability, laundering qualities, and hygiene. An itemized account is kept of the time and money used in making each garment, and comparisons are made with ready-to-wear garments.

58. GARMENT MAKING II. First year, second semester. Recitation, one hour; laboratory, four hours. Three semester credits. Miss Polson.

This course is a continuation of Garment Making I, in which the laboratory work consists in the making of cotton garments of more difficult construction.

59. CLOTHING PROBLEMS AND DESIGN. Second year, first semester. Recitation, two hours; laboratory, four hours. Four semester credits. Associate Professor Cowles.

This course deals with the planning, selecting, making and care of clothing for the different members of the family. Clothing design is studied with a

view to its usefulness in selecting styles, colors and materials of ready-made clothing, as well as in planning garments from the standpoints of cost, health, suitability and style; each girl plans her own clothing budget and keeps account of her clothing expenditures. The clothing needs of the other members of the family are considered, with special attention to infants and children, and budgets are worked out for actual families. The advantages and disadvantages of ready-made clothing, and the problems which arise in its purchase, are considered. The selection and care of household linens are studied.

In the laboratory work, children's clothing is made and practice is given in mending, renovating, and remodeling worn clothing.

60. DRESSMAKING AND MILLINERY. Third year, first semester. Laboratory, six hours. Three semester credits. Miss Worcester.

Through work in the laboratory the problems connected with the construction of silk and wool dresses and of millinery are studied, each girl completing at least one wool or silk dress and one hat. The choice of materials, trimming and style appropriate to each individual is considered. Practice may be obtained in simple embroidery and other hand-work used in trimming dresses or hats.

FOOD ECONOMICS AND NUTRITION

55. ELEMENTARY FOOD STUDY I. First year, first semester. Recitation, one hour; laboratory, four hours. Three semester credits. Miss Kirkpatrick.

The recitations in this course and in Cooking II are spent in a brief study of the source, composition, production and marketing of the various foods studied in the laboratory. The laboratory work includes practice in cooking fruits, vegetables, cereals and starchy products, simple desserts, candies, and the use of fats in frying and in salad dressings.

56. ELEMENTARY FOOD STUDY II. First year, second semester. Recitation, one hour; laboratory, four hours. Three semester credits. Prerequisite: Course 55 or its equivalent. Miss Kirkpatrick.

Flour mixtures and leavening agents are studied, especially as applied to the making of hot breads, cake and pastry; the remainder of the laboratory work is devoted to the principles involved in the cooking of various protein-containing foods, such as eggs, milk, cheese, meats, fish, poultry, legumes and nuts. One or two simple meals are prepared and served in the laboratory. Especial emphasis is laid on the planning of menus for meatless meals.

57. FOOD PROBLEMS I. Second year, first semester. Laboratory, four hours. Two semester credits. Prerequisites: Courses 55 and 56, or their equivalent. Miss Traill.

The canning and drying of fruits, vegetables and meats; the preparation of jellies, jams, preserves and pickles; preservation of eggs; more advanced work with flour mixtures, including bread making; preparation of more elaborate desserts, such as ice creams, sherbets, frappés, and steamed puddings; the making of various salads and sandwiches, and the utilization of left-over foods, comprise the work of this course.

58. FOOD PROBLEMS II. Second year, second semester. Recitation, two hours; laboratory, four hours. Four semester credits. Prerequisites: Courses 55, 56, and 57, or their equivalent.

In this and the preceding course, special emphasis is laid on the dietetic value and economic uses of foods. The work of this course includes the following: a brief consideration of the requirements of an adequate diet, together with planning of meals to meet these requirements; modifications of diet as required for students, men at hard manual labor, infants and small children, school children, the sick and aged; planning food for family groups and at stated costs; conservation of food, fuel and labor; practice in marketing and serving; planning and serving meals for special occasions and for large numbers. Meals are frequently prepared and served by the class throughout the semester to illustrate the principles brought out in class discussion.

HOUSEHOLD ECONOMICS

63. HOME MANAGEMENT. Second year, second semester. Recitation, two hours; laboratory, two hours. Three semester credits. Miss Kaucher.

This course deals with the planning, furnishing and management of the home from the standpoint of efficiency. It includes a study of kitchen plans and equipment; arrangement of other rooms and of storage space; equipment and methods in cleaning and laundering; planning schedules of housework; planning family expenditures; keeping household accounts; buying household supplies.

64. HOME SANITATION. Third year, first semester. Recitation, two hours; laboratory, two hours. Three semester credits. Miss Spafford.

The location, ventilation, heating and lighting of the house, and rural and municipal water supply and sewage disposal, are considered from the standpoints of health, convenience and cost. The sanitary care of the house and of foods is studied, and the relation between public-health problems and home sanitation is examined. The laboratory work includes the first-hand study of the sanitary conditions and equipment of local homes, streets, stores and other buildings, of the local water supply and sewage-disposal systems, and of local public health activities affecting the home.

65. CHILD CARE AND HOME NURSING. Third year, second semester. Recitation, two hours; laboratory, two hours. Three semester credits. Miss Spafford.

This course deals with the care of the mother and the preparation of the clothing and other supplies before the baby's birth; the bathing, dressing, feeding and daily routine of the infant; the care and training of children at different stages in their development, in accordance with their physical, mental, and emotional needs; the nature and symptoms of the diseases to which children are susceptible; the methods of preventing these diseases and of nursing the sick child; the treatment of emergencies and accidents in the home.

Special Courses

Short Courses in Agriculture

Farmers' Short Course

The Agricultural College offers in agriculture primarily a four-year curriculum, which gives the student fundamental training in the sciences relating to agriculture and their application to the production of crops and live stock and to farming in general. Such a curriculum not only equips a man to become a successful farmer, but makes of him a better citizen, and a leader in the broader duties of life.

Many men who have chosen farming as their vocation, and who are alive to some of the advantages offered by this institution to the farmers of the state, are denied the opportunity of pursuing the College curriculum in agriculture, or even as much as one year's work in that curriculum. For such men the Agricultural College provides the Farmers' Short Course.

The course requires two years for completion, an eight-week term being given each year. The date of enrollment is regularly the first Monday after January 4. For 1923 the session will begin Monday, January 8, and close Saturday, March 3. Besides the required subjects each student may take one or two elective subjects each year.

SUBJECTS IN FARMERS' SHORT COURSE

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and laboratory, respectively.

FIRST YEAR

REQUIRED

Soils and Fertilizers	4(4-0)
Live-stock Production I	5(3-4)
Dairying I	5(3-4)
Grain Crops	4(3-2)
Special Lectures	1(2-0)

ELECTIVE

Beekeeping	6(4-4)
Poultry Husbandry	3(3-0)
Fruit Growing	3(2-2)
Live-stock Sanitation	3(3-0)
Farm Management	4(3-2)
Farm Insects	2(2-0)
Injurious Rodents	2(2-0)

It is also possible to elect a limited amount of work in carpentry, blacksmithing, or gas engines.

SECOND YEAR

REQUIRED

Forage Crops	4(3-2)
Live-stock Production II	5(3-4)
Farm Buildings and Equipment	4(4-0)
Farm Horticulture	3(2-2)
Special Lectures	1(2-0)

ELECTIVE

Dairying II	5(3-4)

Any of the subjects listed in the elective work of the first year may also be taken as electives during the second year.

For each hour of recitation per week usually at least one hour of outside preparation is required. Laboratory or field work requires little or no outside

preparation. Each credit (standard for measuring the quantity of work done) represents not less than two hours' work per week for the entire eight weeks of the term. A regular, full-time assignment consists of not less than twenty credits, and students are usually not encouraged to take more than twenty-four credits.

Students desiring further work in farm engineering are referred to "Special Courses Related to Engineering," discussed elsewhere in this catalogue. For example, a man may take intensive work for the training of automechanics or tractor operators during part or all of the months of September, October, November and December, or during part or all of the months of March, April and May, and during the months of January and February devote himself almost exclusively to Farmers' Short-course work.

It must be noted that Farmers' Short-course work cannot be taken at any other time during the year than during this midwinter, eight-week term. Furthermore, students expecting credit must continue the work for the entire term.

CERTIFICATE. A certificate will be granted to each student completing satisfactorily the thirty-six credit hours of work required and not less than four credit hours of electives.

REQUIREMENTS FOR ADMISSION. This course is intended primarily for mature individuals. High-school work in the state is becoming so general and available to all communities that the demand for short-course work for boys of high-school age is being greatly reduced. Young farmers, not in school, are especially urged to consider the advantages of the Farmers' Short Course. Students over seventeen years of age are admitted without examination.

There is no charge for tuition, but each student is required to pay, on enrollment, an incidental fee of $5, also a sick-benefit fee of $1. This latter fee entitles him to free medical attendance by the College physician. In several of the laboratories, laboratory deposits varying from 50 cents upward must be made to cover cost of materials used.

SELF SUPPORT. The subjects of this course are primarily practical. They bring the student into actual contact with farm conditions and products. Besides the classroom work, many hours each week are spent in the stockjudging pavilion, laboratory, shop, and barn. This leaves the student but little time for outside labor, and students are therefore advised to come provided with as nearly all the necessary funds for the course as possible.

BRIEF DESCRIPTION OF THE WORK

SOILS AND FERTILIZERS. (Agron. 3.) In this class the various soil types common in Kansas are studied, especially with reference to their economical management for the production of profitable crops and the maintenance of fertility.

LIVE-STOCK PRODUCTION I. (An. Husb. 6.) The work of this class consists of a study of the principles and practices of feeding and management of live stock. Three-fourths of the time in the laboratory is devoted to judging live stock and the remainder to demonstrations in killing, cutting, curing, and storing of meat on the farm.

DAIRYING I. (Dairy Husb. 1.) This class considers the general subject of farm dairying, including the composition and properties of milk, the feeding of the dairy cow, the selecting and breeding of the dairy herd, and dairy sanitation. The laboratory provides practical work with the Babcock tester, in the use of the farm separator, and in butter making.

GRAIN CROPS. (Agron. 1.) The work in this subject consists of a practical study of grain-crop production. In the laboratory exercises are given for the identification of different kinds of threshed grain and the determination of damage and market classes and grades.

SPECIAL LECTURES. One credit is given each year for attending these lectures. Among the speakers provided will be several members of the College Faculty, including the president of the College, and some of the outside, well-known agricultural leaders.

FORAGE CROPS. (Agron. 2.) This class makes a study of the distribution and production of important forage crops, especially for Kansas conditions. Practical exercises in identification are given in the laboratory.

LIVE-STOCK PRODUCTION II. (An. Husb. 8.) The work of this class consists primarily of a study of the principles and practices in breeding, history of the development of the different breeds, and the pedigrees of noted individuals. Some time is given to the matter of fitting live stock for show and sale. The laboratory work consists of judging.

FARM BUILDINGS AND EQUIPMENT. (Ag. Engr. 2.) This class takes up the fundamental principles of farm building arrangement and construction, including barns, houses, hog houses, poultry houses, machine sheds, silos, cribs, and granaries. Particular attention is given to farm equipment, such as tillage, seeding, and harvesting machinery, both horse-drawn and power. Some time is devoted to concrete construction, farm water systems, sanitation, heating, lighting, and ventilation. Text: Ramsower's *Equipment for the Farm and the Farmstead.*

FARM HORTICULTURE. (Hort. 1.) The work in this class is designed to give the student an appreciation of the possibilities of the art of horticulture in creating better living conditions and better homes. Brief consideration is given to the planning of the farmstead; the planting of ornamentals, windbreaks, and forest trees; and the care of garden, small fruits, and the home orchard. Incidentally an attempt is made to suggest the possibilities of commercial horticulture in localities adapted to special crops.

BEEKEEPING. (Ent. 10.) This subject considers the elements of practical beekeeping. The topics discussed include: Life history, behavior and instincts of the honeybee; products of the apiary; and relation of bees to crop production. A study is made of the various bee diseases, together with their treatment. The laboratory exercises consist of practice in constructing hives, supers, brood frames, comb-honey sections, extracting frames, and wiring frames; also of practice in putting in and embedding foundation. Demonstrations are given of various methods of transferring bees, manipulating colonies for swarm prevention and making increase, treatment of brood diseases, and wintering. The object of the work is to give such practical training as will prepare the student to engage successfully in beekeeping.

POULTRY HUSBANDRY. (Poult. Husb. 1.) The work in Poultry Husbandry covers the practical phases of poultry management, including feeding, breeding, housing, incubation, and brooding.

FRUIT GROWING. (Hort. 2.) This subject is intended to give young men who have the ambition and opportunity to engage in fruit growing the principles that underlie the success of the enterprise. The work includes a discussion of soils and soil conditions; the possibilities of irrigation; the fruit varieties adapted to various locations; plans for planting and care of young orchards; formative pruning and the problems of protecting trees from insects and diseases; and the storage and marketing of fruit.

LIVE-STOCK SANITATION. (Vet. Med. 1.) This subject deals with diseases that are communicable from animal to animal or from animal to man. The causes, symptoms and methods that are employed to prevent and to combat the spread of diseases, and the drugs that are commonly used as disinfectants, for washes, dips, etc., are given full consideration. The use of serums, vaccines, etc., for the prevention of diseases is considered. Methods of disposal of sick and dead animals as well as the means employed to clean and to disinfect the premises so as to prevent a recurrence of diseases are considered.

FARM MANAGEMENT. (Ag. Ec. 1.) In this class the work in the various agricultural subjects is correlated and placed on a practical, workable basis. The principles of farm accounting, distribution of capital, laying out of fields, planning rotations, etc., are given first consideration.

FARM INSECTS. (Ent. 1.) The serious insect pests of the farm, garden and orchard and those affecting domestic animals are discussed in this class. Methods of control are emphasized and the importance of clean culture and good farm methods is fully considered. Lantern slides are used in some of the presentations.

INJURIOUS RODENTS. (Zoöl. 1.) In this class a study is made of injurious rodents, especially gophers, prairie dogs, rats, mice, moles and rabbits, emphasizing their habits and the methods of poisoning, trapping, and otherwise destroying them.

DAIRYING II. (Dairy Husb. 3.) Among the subjects studied and discussed in this class are the following: Keeping records and accounts of dairy-farm business; building up the dairy herd; dairy buildings and equipment; silos and silage; the dairy business and soil fertility; cow-testing associations; coöperative ownership of dairy sires; and detailed plans for the management of the dairy farm. Laboratory work consists of judging dairy cattle from the standpoint of economical production and breed type. Score cards are used for the purpose of making the student systematic and accurate in the selection of dairy animals.

Commercial Creamery Short Course

The Commercial Creamery Short Course is designed to train young men in the manufacture of butter and ice cream and in the handling of market milk. Young men with no previous experience in dairy manufactures may obtain from this course practical and technical training which will give them a foundation on which to build, while those with some previous experience will find the work a great help toward more rapid advancement.

The College creamery, which is run on a commercial basis, provides facilities for this training and the work is in direct charge of experienced, well-trained creamery men. The scope of the work, the nature of its various phases, and the comparative amount of time devoted to each are indicated by the following outline:

SUBJECTS IN COMMERCIAL CREAMERY SHORT COURSE

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and laboratory, respectively.

Creamery Management	2(2-0)
Creamery Butter Making	8(4-8)
Market Milk	2(2-0)
Dairy Bacteriology	2(2-0)
Ice Cream and Cheese Making	4(2-4)
Judging Dairy Products	1(0-2)
Dairying II	5(3-4)
Dairy Mechanics and Refrigeration	2(0-4)

There is no charge for tuition in this short course. Each student is required to pay on enrollment an incidental fee of $5, a laboratory charge of $2, and a sick-benefit fee of $1. This latter fee entitles him to free medical attendance by the College physician.

A certificate will be issued to Commercial Creamery Short-course students who satisfactorily complete all of the required work outlined above, and who show satisfactory evidence of having spent at least six months successfully in actual work in a creamery. Students without this practical experience may acquire it after completing the course. They will then receive their certificate.

BRIEF DESCRIPTION OF THE WORK

CREAMERY MANAGEMENT. This class makes a study of the management of dairy manufacturing plants, dealing with manufacturing efficiency.

CREAMERY BUTTERMAKING. A practical study of buttermaking from the raw milk on the farm to the finished package is made by this class. The centralizing system is given special consideration in the light of Kansas conditions.

MARKET MILK. The problems concerned in the care and handling of milk from production to delivery by the most modern methods are studied in this class.

DAIRY BACTERIOLOGY. The work in this subject is chiefly laboratory work supplemented by brief lectures and explanations. The elementary fundamental problems of dairy bacteriology are considered, including the significance and control of bacteriological contamination in milk and its products.

ICE CREAM AND CHEESE MAKING. The work in this subject deals with the manufacture of ice cream as carried on in the most up-to-date plant. Some time is devoted to cheese making, with special emphasis on the package- and soft-cheese business.

JUDGING DAIRY PRODUCTS. The successful manufacturer must be able to recognize defects in his product. This ability is acquired rapidly in the practice in judging provided in this class.

DAIRYING II. The creamery man deals directly with the farmer. He should know something of the milk producers' problems in order to meet producers intelligently. The work in this class is designed with this idea in mind. (A brief description of the work given in this subject may be found in the "Farmers' Short Course" write-up.)

DAIRY MECHANICS AND REFRIGERATION. The work of this class covers the theory and practice of mechanical refrigeration, pipe fitting, belt lacing, and soldering.

Cream Station Operators' Short Course

The law of the state requires that all persons buying milk or cream by test must pass a satisfactory examination and secure a certificate from the state dairy commissioner. A four-day course for cream-station operators is offered each year at the College during Farm and Home Week to those who wish to gain, in a short time, skill and accuracy in the application of the various tests necessary in such work, and ability to pass the required examination.

Practice in sampling, testing, and grading cream is provided. Lectures are given on points which are necessary for the successful operation of a cream station. A written examination is given on the last day of the course. Further information regarding this course or other final examinations for cream station operators held either at Manhattan or other points in the state may be obtained from THE VICE PRESIDENT, KANSAS STATE AGRICULTURAL COLLEGE, MANHATTAN, KAN.

Short Course in Wheat and Flour Testing

Many workers in the milling industry are anxious to take a few weeks in which to secure intense, practical training in their field. The College in endeavoring to meet the needs of this group of workers has provided a four-week course known as the Short Course in Wheat and Flour Testing. It begins the last Monday in April each year.

This course affords opportunity for making experimental milling tests and experimental baking tests as well as practice and demonstration in the following chemical determinations: absorption, gluten, ash, moisture, acidity, and

protein. Special lectures are given on wheat classes and grades, flour and feed classes, and on insects injurious to stored grain and mill products.

The well-equipped mill and laboratories used for College courses are available to short-course students taking this work. An incidental fee of $2.50 is charged and a laboratory fee of $10 to cover the cost of materials used.

For further information address THE VICE PRESIDENT, KANSAS STATE AGRICULTURAL COLLEGE, MANHATTAN, KAN.

Short Course for Dairy Herdsmen

During recent years there has been a growing demand from men experienced in dairy cattle management for a state conference and intensive first-class instruction and demonstrations in the feeding, care, and management of dairy cattle. A two-week course, therefore, has been provided along these lines to be known as the Short Course for Dairy Herdsmen. It will begin the first Monday in December each year.

The program will consist of lectures, demonstrations, and laboratory work and will be provided by the Department of Dairy Husbandry with the assistance of a few other outstanding leaders in the dairy industry. Any of the practical problems of dairy management may be considered. Some work in testing milk and its products will be provided and some time devoted to the study of pedigrees.

Daily programs will be available each fall not later than November 20. For further information write to THE VICE PRESIDENT, KANSAS STATE AGRICULTURAL COLLEGE, MANHATTAN, KAN.

Short Course for Beef-cattle Herdsmen

In response to a demand from the cattle breeders of the state for intensive work in the study of their problems, this short course is being offered by the Department of Animal Husbandry. It is a two-week course beginning soon after Christmas each year. The next session of the course will open December 27, 1922, and close January 6, 1923.

The primary purpose of this course is to offer instruction that will help breeders of pure-bred beef cattle, particularly beginners, in raising and fitting cattle for the show ring. The work is practical and intensive. The program for each day of the session is as follows:

8 to 9 a. m.—Lecture: Feeds and Feeding Show Cattle
9 to 10 a. m.—Lecture: Principles of Animal Breeding
10 to 11 a. m.—Lecture: Cattle Management Problems
11 to 12 a. m.—Lecture: History of Beef-cattle Breeds
1 to 3 p. m.—Judging Beef Cattle
3 to 5 p. m.—Practice in dressing horns, washing, curling, showing, etc.

Enrollment in this course must be made in advance. Application for work in the coming session must be in before December 16, 1922. For further information write to THE VICE PRESIDENT, KANSAS STATE AGRICULTURAL COLLEGE, MANHATTAN, KAN.

Short Courses Related to Engineering

Automobile Operation
Automobile Repair
Tractor Operation
Foundry Practice
Carpentry
Machine-shop Work
Blacksmithing
Electrical Repair Work

The following short courses are intended for those who have not the time or the means to take any of the regular engineering courses in the College, but who wish to obtain a practical working knowledge of one of the trades related to engineering.

Students may enroll in the special Short Course in Electrical Repair Work

on the first Monday in January only. Students may enroll in any of the other seven special short courses on the second Monday in September (the regular date for the beginning of the College year) and the first Monday of October, November, December, January, February, March, April, May, June, or July. In case the first Monday of January falls on New Year's Day, the special short courses will begin on the following Tuesday. In other words, the special short courses will begin in 1923 on Tuesday, January 2. Instruction in the special short courses is regularly suspended during the five weeks immediately preceding the second Monday in September, or from the close of the Summer School until the opening of the College year in September. Vacation dates are observed on December 24, 25 and 26.

There is no charge for tuition, but an incidental fee of $5 for the eight-week courses, or $10 for the longer courses, not exceeding eighteen weeks in length, is charged at entrance. A sick-benefit fee of $1 for the eight-week courses, or $1.50 for the longer courses, is also charged, and entitles the student to free medical attendance from the College physician. Laboratory charges to cover the cost of materials used are made in accordance with the following schedule: automobile operation, automobile repair, tractor operation, blacksmithing, machine shop, and electrical repair courses, $18 for each four weeks; carpentry and foundry courses, $9 for each four weeks. The cost of books and tools for the various courses ranges from $5 to $20, depending on the course selected.

The College reserves the right to revise its schedule of fees at any time without notice.

AUTOMOBILE OPERATION. This course covers a period of eight weeks, and it is intended for those who wish to learn to operate and repair their own automobiles. Two weeks of the course is spent in studying the mechanism, adjustments and construction of the automobile, and includes such work as the grinding of valves, the fitting of bearings, the fitting of rings, lapping in pistons, valve timing, and other work of particular value to the automobile owner. Four weeks of the course are spent in studying the lighting, ignition, starting, and generating systems used on the various cars and the proper methods of caring for them, special emphasis being placed on the practical phase of this work. Two weeks are spent in the automobile repair section, giving special attention to the electrical and fuel systems used on the Ford, Dodge, Cadillac, Packard, Franklin, Paige, and other cars.

AUTOMOBILE REPAIR. This course covers a period of twelve weeks and is designed for those who expect to enter commercial shops and work as garage mechanics. During the first eight weeks of this course the work is identical to that as described for the course in Automobile Operation. After the completion of the first eight weeks of work, one week is spent in soldering and babbitting and covers work of the most practical nature in making and soldering all types of electric-wire splices and the tinning of cast-iron and steel bearings for babbitting purposes. Two weeks are spent in the electrical section and covers the more advanced phases of the work. The electrical section includes a study of the construction and operation of storage batteries, magnetos, coils, cut-outs, relays, regulators, circuit breakers, and various electrical equipment found on standard cars. The final week is spent in repair work, going more into detail as to "trouble-shooting," tire repair and other work of special value to the garage mechanic.

TRACTOR OPERATION. This course covers a period of eight weeks, and treats the construction, operation, and adjustment of all kinds of tractors and their equipment. One week is spent in the study of each of the following subdivisions: tractor construction, carburetion, ignition, stationary gas engines, dead tractor engines, tractor operation, tractor repairs, and power field machines.

The College has ample laboratory facilities for carrying out the work successfully. Among the equipment used in giving this instruction will be found: complete tractors of the latest models; tractor motors unmounted; laboratory sets of clutches, gears, and differentials; sectional and working models of magnetos, coils, and carburetors as used on various types of trac-

tors; stationary gas engines; various types and makes of tractor field tools; and a practical repair shop equipped with standard tools.

CARPENTRY. A practical study is made of general carpenter work, including the use of carpenters' tools, reading of drawings and blue prints, hand work and machine work, framing, building construction, and form building for concrete.

MACHINE-SHOP WORK. This course in machine-shop work is designed to meet the demands of those who must prepare themselves in a short time for this line of work. The work is adapted to the needs of the individual student. The entire machine shop of the College is available for this course, which includes a thorough training in the operation of lathes, planers, drill presses, boring mills, shapers, and grinding machines.

In order to enable the student to become familiar with both tools and shop processes, the construction of standard gasoline engines and wood lathes is followed from the machining of the rough castings to the assembly of finished parts. Students may in this way make their own engines and lathes.

FOUNDRY PRACTICE. This course is intended to train practical molders, and includes bench molding with a great variety of patterns; work with different kinds of sands and facings; open sand work; sweep molding; machine molding; core making; setting of cores, gates, and risers; different methods of venting; and general foundry practice.

BLACKSMITHING. A practical course is given in forging operations, such as drawing, welding, bending, twisting, and punching iron and steel, the care of forge fire; the making of various tools, such as punches, chisels, drills, scrapers, and hammers; hardening, tempering, annealing, case and pack hardening; and oxyacetylene and thermit processes of welding.

ELECTRICAL REPAIR WORK. This course is intended to train electricians, and includes electric wiring, and the operation of dynamos, motors, and other electrical equipment.

Short Courses in Home Economics

Housekeepers' Course in Home Economics

There are large numbers of young women who, from lack of time, are unable to take an extended course, but who recognize the need for special training in home making. The twentieth century demands of home managers an understanding of the sanitary requirements of the home, a knowledge of values, absolute and relative, of the articles used in the house, quick attention to details, good judgment in buying, and a ready adaptation of means to the end in view. The purpose of the Housekeepers' Course is to furnish this training. The teaching in this course is no less accurate than in the regular course, but is necessarily different. Given to students without scientific training, the instruction must be more largely a presentation of facts, without an elaboration of the underlying principles. The work is intensely practical, and the hundreds of young women who take this course go back to their homes with a broader view of life, and a knowledge and training that will enable them to meet their responsibilities. This course is given during the first fifteen weeks of each semester.

REQUIREMENTS FOR ADMISSION. Young women between the ages of eighteen and twenty-one are admitted upon presentation of common-school diploma, grammar-school certificate, or high-school diploma. Young women over twenty-one years of age are admitted without examination.

HOUSEKEEPERS' COURSE

Cookery	Floriculture
Sewing	Design in the Home and in Clothing
Hygiene	Housewifery

1. COOKERY. Both semesters. Laboratory, nine hours.

Stoves, stove construction, stove management, and fuels are the first topics considered. This discussion is followed by experiments illustrating the effect of heat upon starch and proteins. The necessary elementary principles involved are then applied to the cooking of cereals, vegetables, beverages, breads, meats, soups, simple cake mixtures, and puddings, and to the canning and preserving of fruits and vegetables. Special attention is given to the planning and serving of meals.

2. SEWING. Both semesters. Laboratory, ten hours.

This course includes practice in hand and machine sewing and dressmaking. The fundamental stitches are applied to simple articles and to the repairing of garments. Practice is given in the use of the sewing machine, and in the adaptation of commercial patterns. Suitable materials and trimmings are discussed, and undergarments, a shirt waist, and a cloth dress are made. Notebook work is required.

3. HYGIENE. Both semesters. Class work, three hours.

This course deals with the principles of elementary hygiene and their application in the maintenance of personal health and of sanitary conditions in the home and community. A study is made of the prevention and control of disease through personal hygiene, the sanitary care of the house, and public-health work. Attention is also given to the recognition and reporting of symptoms, the practical care of the sick, and the giving of first-aid treatment in common emergencies in the home.

4. DESIGN IN THE HOME AND IN CLOTHING. Both semesters. Laboratory, six hours.

This course makes a study of the design principles used in dress and in the problems of the home. Suitable lines and colors for dress are discussed and many practical problems are given. In home decoration the study involves the choice and arrangement of furniture, the choice of wall paper and of rugs, the use of color in the home, and the selection and arrangement of pictures.

5. FLORICULTURE. Both semesters. Class work, two hours.

Lectures in the classroom are supplemented in the greenhouse by practical exercises dealing with the propagation and culture of flowers. Soil requirements, the planting of seeds, transplanting, cultivation, the making of cuttings, the selection of varieties adapted to the purpose of window gardening, and lawn planting and cutting are discussed in the lectures. An opportunity to become acquainted with the species recommended and with the operations necessary for their successful culture is afforded in the laboratory practice.

6. HOUSEWIFERY. Both semesters. Laboratory, three hours.

This is a course in practical housekeeping, emphasis being placed upon efficiency in the use of time, money, and strength. It includes a study of house plans, furnishings and equipment, the cleaning and care of rooms, laundering and the care of clothing, the planning of expenditures, buying of supplies, and keeping of accounts.

One-year Curriculum in Lunch-room Management

It is the purpose of this curriculum to offer training to mature women who are fitted by education and ability to carry on some form of lunch-room management. The positions open to such women will be commercial ones only, as the department reserves the right to recommend only the members of the College institutional classes for positions in educational institutions and hospitals.

The curriculum covers one year, and certificates are granted on the successful completion of the work.

REQUIREMENTS FOR ADMISSION. The curriculum is open to women twenty-five years of age or older. Applications for entrance must be made in writing, and applicants are chosen according to training and ability. The number in the class is limited to twenty, in order to give each member the personal training necessary.

HOW TO APPLY FOR ENTRANCE. A student desiring admission to this curriculum is asked to write a letter, stating her general qualifications and training, to the dean of the Division of Home Economics. After consideration by the dean of the division, the candidates for this course will be chosen.

LUNCH-ROOM MANAGEMENT CURRICULUM

Principles of Cookery	4(0-12)
Food Production and Marketing	3(3-0)
Business English LR	3(3-0)
Cafeteria Practice I	2(0-6)
Sanitation and Hygiene	1(1-0)
Furnishing and Decorating	1(0-3)
Institutional Cookery	4(1-9)
Accounting	2(2-0)
Lunch-room Management	2(2-0)
Cafeteria Practice II and Tea-room Service	4(0-12)
Lunch-room Promotion	1, for half semester
Meal Planning	1, for half semester

1. PRINCIPLES OF COOKERY. First semester. Laboratory, twelve hours.

The purpose of this course is to teach the principles of cookery by means of the preparation of different foods. This course includes both plain and fancy cookery. A standard system of measurement is taught, and special attention is given to training in accuracy, neatness, and economy in handling utensils and materials. Standard servings and the cost of prepared foods are carefully estimated.

2. FOOD PRODUCTION AND MARKETING. First semester. Class work, three hours.

The main points in source, production, and manufacture of foods are covered. Special stress is laid on marketing and buying for the lunch room. Food values are emphasized.

3. SANITATION AND HYGIENE. First semester. Class work, one hour.

The sanitary control of eating houses and food supply, together with the personal hygiene of the worker, are here discussed.

4. CAFETERIA PRACTICE I. First semester. Laboratory, six hours.

The purpose of this course is to make the student thoroughly familiar with the cafeteria. Experience is had in serving, checking and other details.

5. CAFETERIA AND TEA-ROOM PRACTICE. Second semester. Laboratory, twelve hours.

Experience in the cafeteria is continued, with practice in the preparation of food. During part of the course the students carry on a tea room in the dining room of the department. So far as it is practicable, opportunity is given to do catering. Careful attention is given to service and cost of maintenance.

6. BUSINESS ENGLISH LR. First semester. Class work and practice, three hours.

This course is designed to meet the needs of those who are especially preparing themselves to manage lunch rooms. Essential forms of business correspondence, contract forms, the best forms of making and displaying notices and posters, the best current literature in home economics, and well-directed cultural reading are given their proper emphasis.

7. FURNISHING AND DECORATING. First semester. Laboratory, three hours. Color, form, and arrangement as applied to wall and floor coverings, furniture, linen, china, and silver are studied.

8. INSTITUTIONAL COOKERY. Second semester. Class work, one hour; laboratory, nine hours.

This course applies the principles of cookery to the preparation of large quantities of food for use in the cafeteria. The course is given in the kitchen laboratory of the cafeteria.

9. ACCOUNTING. Second semester. Class work, two hours.

This is a course in the elements of bookkeeping and of business practice as applied to the accounts of lunch rooms, tea rooms, and cafeterias.

10. LUNCH-ROOM MANAGEMENT. Second semester. Class work, two hours. The course covers the field organization, equipment, service, and general management of lunch rooms.

11. MEAL PLANNING. Second semester. Class work, one hour for half the semester.

The planning of meals according to dietary standards is taught in this course. Practice is given in planning menus for cafeterias and tea rooms.

12. LUNCH-ROOM PROMOTION. Second semester. Class work, one hour for half the semester.

The purpose of the course is to show the practical application of the principles of advertising and publicity to the enterprises treated in the course in lunch-room management. The several kinds of advertising are taken up in their relation to the lines of business which the students plan to enter. The principles of typographical design as adapted to menu cards and other necessary printed material receive careful attention.

Officers of Instruction and Administration

PRESIDENT

WILLIAM MARION JARDINE, B.S.A., LL.D., President of the College (1910, 1918.)*
B. S. A., Utah Agricultural College, 1904; LL. D., Campbell College, 1916.
† A 30; 1020 Houston.

PROFESSORS

JOHN DANIEL WALTERS, M.S., A.D., Professor of Architecture, Emeritus (1876, 1917).
‡ M. S., 1883; A. D., 1908. E 56; 809 N. Eleventh.

JULIUS TERRASS WILLARD, M.S., Sc.D., Vice President of the College (1883, 1918); Dean of Division of General Science (1883, 1909); Professor of Chemistry (1883, 1901); Consulting Chemist, Agricultural Experiment Station (1888, 1918).
B. S., 1883; M. S., 1886; Sc. D., 1908. A 47; 1725 Poyntz.

BENJAMIN LUCE REMICK, Ph.M., Professor and Head of Department of Mathematics (1900).
Ph. B., Cornell College, 1889; Ph. M., ibid., 1892. E 223; 613 Houston.

ALBERT DICKENS, M.S., Professor and Head of Department of Horticulture (1899, 1902); Horticulturist, Agricultural Experiment Station (1899, 1902).
B. S., 1898; M. S., 1901. H 28; 1230 Fremont.

RALPH RAY PRICE, A.M., Professor and Head of Department of History and Civics (1903).
A. B., Baker University, 1896; A. M., University of Kansas, 1898.
F 57; 826 Houston.

JULIUS ERNEST KAMMEYER, A.M., LL.D., Professor and Head of Department of Economics (1903, 1904).
A. B., Central Wesleyan College, 1886; A. M., ibid., 1889; LL. D., Kansas City University, 1912. A 52; 1010 Vattier.

JOHN VANZANDT CORTELYOU, Ph.D., Professor and Head of Department of Modern Languages (1904, 1916).
A. B., University of Nebraska, 1897; A. M., ibid., 1901; Ph. D., University of Heidelberg, 1904. A 71; 325 N. Fourteenth.

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* One date standing after the title shows when the office was assumed. In the case of two dates separated by a comma or a semicolon, the first date indicates when services with the College began, the second when present office was assumed. Dates separated by a dash indicate times of assumption and termination, respectively, of the duties indicated in the title.

† The College buildings are designated by letters, as follows:

A—Anderson Hall (Administration).
Ag—Waters Hall (Agriculture).
Bks—Barracks.
C—Denison Hall (Chemistry, Physics).
CH—College Hospital.
D—Dairy Hall.
E—Engineering Hall.
F—Fairchild Hall (Library).
G—Vocational School Hall.
H—Horticultural Hall.
I—Illustrations Hall.
K—Kedzie Hall (Printing).
L—Home Economics Hall.
M—Auditorium.
MA—Music Annex.
N—Nichols Gymnasium.
R—Farm Machinery Hall.
S—Engineering Shops.
V—Veterinary Hall.
W—Chemistry Annex.
X—Dairy Commissioner Building.

‡ In a statement of degrees without mention of the institution conferring them, the Kansas State Agricultural College is to be understood.

JOHN ORR HAMILTON, B. S., Professor and Head of Department of Physics (1901, 1908); Physicist, Engineering Experiment Station (1913).
B. S., University of Chicago, 1900. C 33; 331 N. Fourteenth.

MARY PIERCE VAN ZILE, Dean of Women (1908, 1918).
Diploma, Iowa State College, 1904. A 40; 800 Houston.

LOWELL EDWIN CONRAD, M. S., Professor and Head of Department of Civil Engineering (1908, 1909); Civil Engineer, Engineering Experiment Station (1913).
B. S., Cornell College, 1904; C. E., ibid., 1906; M. S., Lehigh University, 1908. E 124; 317 N. Seventeenth.

LESLIE ARTHUR FITZ, B. S., Professor and Head of Department of Milling Industry (1910, 1912).
B. S., 1902. Ag 40, 1014 Houston.

EDWIN LEE HOLTON, A. B., Professor and Head of Department of Education (1910, 1913); Dean of the Summer School (1910, 1918).
A. B., Indiana University, 1904. A 32; 217 N. Fourteenth.

ROY ANDREW SEATON, M. S., Dean of Division of Engineering (1904; Sept. 1, 1920); Director of the Engineering Experiment Station (1904; Sept. 1, 1920); Professor and Head of the Department of Applied Mechanics and Machine Design (1904, 1914).
B. S., 1904; M. S., 1910; S. B., Massachusetts Institute of Technology, 1911. E 115; 722 Humboldt.

ARTHUR BOURNE SMITH, Ph. B., B. L. S., College Librarian (1911).
Ph. B., Wesleyan University, 1900; B. L. S., University of Illinois, 1902. F 32; 810 S. Juliette.

WILLIAM ADAMS LIPPINCOTT, Ph. D., Professor and Head of Department of Poultry Husbandry (1912); Poultry Husbandman, Agricultural Experiment Station (1912).
A. B., Illinois College, 1903; B. S., Iowa State College, 1911; M. S., University of Wisconsin, 1917; Ph. D., ibid., 1920. Ag 38; 321 N. Eighteenth.

LELAND DAVID BUSHNELL, Ph. D., Professor and Head of Department of Bacteriology (1909, 1912); Bacteriologist, Agricultural Experiment Station (1909; 1912).
B. S., Michigan Agricultural College, 1905; M. S., University of Kansas, 1915; Ph. D., Harvard University, 1921. V 54; 801 Osage.

LELAND EVERETT CALL, M. S., Professor and Head of Department of Agronomy (1907; 1913); Agronomist, Agricultural Experiment Station (1907, 1913).
B. S. in Agr., Ohio State University, 1906; M. S., ibid., 1912. Ag 58; 223 N. Fourteenth.

GEORGE ADAM DEAN, M. S., Professor and Head of Department of Entomology (1902, 1913); Entomologist, Agricultural Experiment Station (1902, 1913).
B. S., 1895; M. S., 1905. F 52; 1000 Leavenworth.

ROBERT KIRKLAND NABOURS, Ph. D., Professor and Head of Department of Zoology (1910, 1913); Zoölogist, Agricultural Experiment Station (1910, 1913); Curator of the Natural History Museum (1910).
Ed. B., University of Chicago, 1905; Ph. D., ibid., 1911. F 54; 930 Laramie.

RALPH RALPH DYKSTRA, D. V. M., Dean, Division of Veterinary Medicine (1911; 1919); Professor of Surgery and Head of Department of Surgery and Medicine (1911, 1913).
D. V. M., Iowa State College, 1905. V. 29; 607 Houston.

CLARENCE ERLE REID, B.S., Professor and Head of Department of Electrical Engineering (1914); Electrical Engineer, Engineering Experiment Station (1914).
B. S. in E. E., Purdue University, 1902. E 119; 421 N. Sixteenth.

MICHAEL FRANCIS AHEARN, M.S., Professor and Head of Department of Physical Education, and Director of Athletics (1904; Sept. 16, 1920).
B. S., Massachusetts Agricultural College, 1904; M. S., 1913. N 35; 110 N. Juliette.

NELSON ANTRIM CRAWFORD, A.M., Professor and Head of Department of Industrial Journalism and Printing (1910, 1915).
A. B., State University of Iowa, 1910; A. M., University of Kansas, 1914.
K 52; 221 N. Juliette.

CHARLES MOSES SIEVER, Ph.G., M.D., College Physician (1916).
Ph. G., Trinity University, 1903; M. D., ibid., 1903; M. D., University of Kansas, 1907.
A 65; 1719 Laramie.

WALTER WILLIAM CARLSON, B.S., M.E., Professor and Head of Department of Shop Practice (1910, 1917); Superintendent of Shops (1910, 1912); Industrial Engineer, Engineering Experiment Station (1913).
B. S., 1908; M. E., 1916. S 62; 1729 Laramie.

SAMUEL CECIL SALMON, B.S., Professor of Farm Crops (1913, 1917).
B. S., South Dakota Agricultural and Mechanical College, 1907.
Ag 82; 1648 Leavenworth.

JAMES GORDON EMERSON,[4] J.D., Professor and Head of Department of Public Speaking (1915, 1917).
B. S., Iowa State College, 1912; J. D., Leland Stanford, Junior, School of Law, 1915.
G 56; 1623 Anderson.

CECIL FRANKLIN BAKER, M.S., Professor and Head of Department of Architecture (1917); Architect, Engineering Experiment Station (1917).
A. B., University of Illinois, 1907; B. S., Massachusetts Institute of Technology, 1907; M. S., ibid., 1909. E 57; Kenilcote, College Hill.

WALTER HORACE BURR, B.S., Professor of Sociology (1914; Jan. 1, 1921); Director of Rural Service, Division of College Extension (1914, 1915-Jan. 1, 1921).
B. S., 1920. A 69; 1627 Anderson.

HARRY JOHN CHARLES UMBERGER,[2] B.S., Dean, Division of College Extension (1911, 1919); Director of College Extension (1911, 1919).
B. S., 1905. A 33; 1412 Leavenworth.

MARY WHITING MCFARLANE, M.S., Professor of Home Economics Extension, in Charge of Home Economics Specialists, Division of College Extension (1918; Feb. 15, 1921).
B. S., University of Wyoming, 1894; M. S., Oregon Agricultural College, 1916.
A 36; 1425 Laramie.

HERBERT HIRAM KING, Ph.D., Professor and Head of Department of Chemistry (1906, 1918); Chemist, Agricultural Experiment Station (1918); Chemist, Engineering Experiment Station (1909, 1918).
B. S., Ewing College, 1904; A. M., ibid., 1906; M. S., 1915; Ph. D., University of Chicago, 1918. C 30; 916 Humboldt.

CHARLES WILBUR MCCAMPBELL, D.V.M., Professor and Head of Department of Animal Husbandry (1910, 1918); Animal Husbandman, Agricultural Experiment Station (1910, 1918).
B. S., 1906; D. V. M., 1910; B. S. in Agr., 1918. Ag 8; 343 N. Fourteenth.

2. In coöperation with the U. S. Department of Agriculture.
4. Absent on leave, 1921-'22.

RAY IAMS THROCKMORTON, B.S., Professor of Soils (1911, 1918).
B. S., Pennsylvania State College, 1911. Ag 60; 825 Houston.

JAMES EDWARD ACKERT, Ph.D., Professor of Zoölogy (1913, 1918); Parasitologist, Agricultural Experiment Station (1913).
A. B., University of Illinois, 1909; A. M., ibid., 1911; Ph. D., ibid., 1913.
F 58; 1605 Humboldt.

ALFRED EVERETT WHITE, M.S., Professor of Mathematics (1909, 1918).
B. S., Purdue University, 1904; M. S., ibid., 1909. A 72; 1743 Fairchild.

JAMES BURGESS FITCH, B.S., Professor and Head of Department of Dairy Husbandry (1910, 1918); Dairy Husbandman, Agricultural Experiment Station (1910, 1918).
B. S., Purdue University, 1910. D 30; 321 N. Sixteenth.

HALLAM WALKER DAVIS, A.M., Professor of English (1913, 1918); Head of Department of English (1913; July 1, 1921).
A. B., Indiana University, 1909; A. M., Columbia University, 1913.
A 61; 520 N. Manhattan.

ARAMINTA HOLMAN, Professor and Head of Department of Applied Art (1913, 1918).
Graduate, New York School of Fine and Applied Art, 1912.
A 67; 327 N. Fifteenth.

FRANCIS DAVID FARRELL, B.S., Dean, Division of Agriculture (1918); Director, Agricultural Experiment Station (1918).
B. S., Utah Agricultural College, 1907. Ag 34; 1515 Leavenworth.

HELEN BISHOP THOMPSON, Ph.D., Dean, Division of Home Economics (1918); Professor of Nutrition and Dietetics (1918).
B. S., 1903; M. S., 1907; A. M., Columbia University, 1913; Ph. D., Yale University, 1917. L 30; 1212 Fremont.

VIVAN LEWIS STRICKLAND, A.M., Professor of Education, in Charge of Home Study Service, Division of College Extension (1917; Feb. 15, 1921).
A. B., University of Nebraska, 1906; A. M., ibid., 1915.
A 4; 1512 Leavenworth.

JAMES PARK CALDERWOOD, M.E., M.S., Professor of Mechanical Engineering (1918, 1919); Head of Department of Steam and Gas Engineering (1918; July 1, 1920); Mechanical Engineer, Engineering Experiment Station (1918).
M. E., Ohio State University, 1908; M. S., Pennsylvania State College, 1916.
E 106; 321 N. Fourteenth.

JAMES HENRY BURT, D.V.M., Professor and Head of Department of Anatomy and Physiology (1909, 1919).
V. S., Ontario Veterinary College, 1895; D. V. M., Ohio State University, 1905.
V 32; 800 Poyntz.

LEO EDWARD MELCHERS, M.S., Professor and Head of Department of Botany and Plant Pathology (1914, 1919); Plant Pathologist, Agricultural Experiment Station (1914).
B. S., Ohio State University, 1912; M. S., ibid., 1913. H 58; 1801 Leavenworth.

EDWIN CYRUS MILLER, Ph.D., Professor of Plant Physiology (1910, 1919).
A. B., Lebanon College, 1906; A. B., Yale University, 1907; Ph. D., ibid., 1910.
H 56; 501 Laramie.

LOTTA JEAN BOGERT, Ph.D., Professor and Head of Department of Food Economics and Nutrition (1919).
A. B., Cornell University, 1910; Ph. D., Yale University, 1916.
L 42; 1605 Leavenworth.

HILDEGARDE KNEELAND, A.B., Professor and Head of Department of Household Economics (1919).
A. B., Vassar College, 1911. L 42; 1212 Fremont.

FREDERICK BRAHAN TERRELL, Major Inf., U. S. A., Professor and Head of Department of Military Science and Tactics (1919); Commandant of Cadets (1919).
N 26; 830 Houston.

THOMAS JESSE TALBERT, A.M., Professor of Agricultural Extension, in Charge of Institutes and Extension Schools, Division of College Extension (1919; Feb. 15, 1921).
B. S. in Agr., University of Missouri, 1913; A. M., ibid., 1917. A 34; 817 Osage.

CYRUS VANCE WILLIAMS, B.S. (in Agr.), A.M., Professor of Vocational Education (May 15, 1920).
B. Ed., (Peru) Nebraska State Normal School, 1909; A. M., University of Nebraska, 1910; B. S. in Agr., College of Agriculture, ibid., 1919. A 63; 909 Fremont.

WILLIAM HIDDLESON ANDREWS,[4] A.B., M.S., Professor of Education (1906; July 1, 1920).
A. B., University of Chicago, 1900; M. S., 1919. A 64; 630 Mcro.

CHARLES OSCAR SWANSON,[4] M.Agr., Professor of Agricultural Chemistry (1906; July 1, 1920); Associate Chemist, Agricultural Experiment Station (1906, 1914).
A. B., Carleton College, 1899; M. Agr., University of Minnesota, 1905.
C 6; 931 Bluemont.

IVOR VICTOR ILES, A.M., Professor of History and Civics (1911; July 1, 1920).
A. B., University of Kansas, 1905; A. M., ibid., 1905. F 4; 1725 Fairchild.

JOSIAH SIMSON HUGHES, Ph.D., Professor of Chemistry (1910; July 1, 1920).
B. S., Ohio Wesleyan University, 1908; M. S., ibid., 1910; A. M., Ohio State University, 1910; Ph. D., ibid., 1917. C 41; 344 N. Fifteenth.

ROBERT WARREN CONOVER, A.M., Professor of English (1915; July 1, 1920).
A. B., Wesleyan University, 1911; A. M., ibid., 1914. A 61; 1409 Anderson.

JOHN CHRISTIAN PETERSON, Ph.D., Professor of Education (1917; July 1, 1920).
A. B., University of Utah, 1913; Ph. D., University of Chicago, 1917.
G 27; 1001 Thurston.

WILLIAM EDWARD MULDOON, D.V.M., A.M., Professor of Medicine (1919; July 1, 1920).
D. V. M., New York State Veterinary College, 1913; A. M., Cornell University, 1916.
V 33; 1409 Anderson.

FREDERICK ERVING COLBURN, Professor and Head of Department of Illustrations (1919; July 1, 1920).
I; 322 N. Seventeenth.

HERBERT FREDERICK LIENHARDT, V.M.D., Professor and Head of Department of Pathology (1917; July 1, 1920).
V. M. D., University of Pennsylvania, 1916. V 58; 210 S. Tenth.

GEORGE ELLSWORTH RABURN, M.S., Professor of Physics (1910; Sept. 1, 1920).
A. B., University of Michigan, 1907; M. S., ibid., 1916. C 34; College Heights.

LOUISE PHILLIPS GLANTON, A.M., Professor and Head of Department of Clothing and Textiles (Sept. 1, 1920).
B. S., Columbia University, 1905; A. M., ibid., 1917. L 56; 1220 Laramie.

4. Absent on leave, 1921-'22.

ROBERT JOHN BARNETT, M.S., Professor of Horticulture (Oct. 10, 1920).
B. S., 1895; M. S., 1911. H 33; 512 N. Ninth.

HARRY BRUCE WALKER, B.S. in C.E., Professor of Agricultural Engineering (1914; July 1, 1921).
B. S. in C. E., Iowa State College, 1910; C. E., ibid., 1920.
E 216; 110 S. Seventeenth.

KARL KNAUS,[2] B.S., Professor of Agricultural Extension, in Charge of County Agent Work, Division of College Extension (1916; Feb. 15, 1921).
B. S., 1914. A 2; 519 N. Fourteenth.

MARY THERESA HARMAN, Ph.D., Professor of Zoölogy (1912; July 1, 1921).
A. B., Indiana University, 1907; A. M., ibid., 1909; Ph. D., ibid., 1912.
F 76C; 1430 Poyntz.

FLOYD WAYNE BELL, B.S.A., Professor of Swine Husbandry (1918; July 1, 1921).
B. S. A., Cornell University, 1911. Ag 5; 906 Osage.

EUSTACE VIVIAN FLOYD, B.S., Professor of Physics (1911; July 1, 1921).
B. S., Earlham College, 1903. C 34; 1451 Laramie.

WALDO ERNEST GRIMES,[5] B.S., Professor and Head of Department of Agricultural Economics (1913; July 1, 1921).
B. S., 1913. Ag 51A; 1821 Leavenworth.

ANDREW MINIE PATERSON, B.S., Professor of Sheep Husbandry (1913; July 1, 1921).
B. S., 1913. Ag 13; 1320 Fremont.

JOHN HUNTINGTON PARKER, M.S., Professor of Crop Improvement (1917; July 1, 1921).
B. S. in Agr., University of Minnesota, 1913; M. S. in Agr., Cornell University, 1916.
Ag 76; 1809 Leavenworth.

HOWARD TEMPLETON HILL, J.D., Professor and Acting Head of Department of Public Speaking (Oct. 1, 1920; July 1, 1921).
B. S., Iowa State College, 1910; J. D., University of Chicago, 1917.
G 56; 1623 Anderson.

IRA PRATT, Professor and Head of Department of Music (June 2, 1921).
M 30; 814 Osage.

ERIC ENGLUND,[3] M.S., Professor in Charge of Department of Agricultural Economics (July 1, 1921 - August 31, 1922).
B. S., Oregon Agricultural College, 1918; A. B., University of Oregon, 1919; M. S., University of Wisconsin, 1920. Ag 51A; 1623 Anderson.

MARK HAVENHILL, B.S., Agr. Engr., Professor of Engineering, in Charge of Department of Rural Engineering, Division of College Extension (July 1, 1921).
B. S. Ag., Iowa State College, 1904; B. S. Agr. Engr., ibid., 1918.
E 130; 1331 Poyntz.

NOBLE WARREN ROCKEY, A.M., Professor of English (September 1, 1921).
A. B., Ohio State University, 1905; A. M., ibid., 1916. A 58; 514 N. Manhattan Ave.

NINA BELLE CRIGLER, A.M., Professor in Charge of Department of Home Demonstration Agents, Division of College Extension (October 1, 1921).
B. S., Teachers' College, Columbia University, 1909; A. M., ibid., 1921.
A 36; R. F. D. 1.

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2. In coöperation with the U. S. Department of Agriculture.
3. Temporary appointment.
5. Absent on leave, October 1, 1921, to August 31, 1922.

ASSOCIATE PROFESSORS

ODIS HERSCHEL BURNS,[1] A.B., Associate Professor of English, and Debate Coach (1918, 1919 - November 15, 1921).
A. B., University of Kansas, 1916.

LEWIS CLARK DAVIDSON, Major Inf., U. S. A., Associate Professor of Military Science and Tactics (1919).
Graduate, United States Military Academy, 1915. N 27; 715 Houston.

OLIVER WILLIAM HUNTER,[1] M.S., Associate Professor of Bacteriology (1911, 1917 - September 30, 1921).
B. S., 1909; M. S., University of Wisconsin, 1911.

PORTER JOSEPH NEWMAN, M.S., Associate Professor of Chemistry (1909, 1918).
B. S., Franklin College, 1908; M. S., ibid., 1910. W 27; 914 Leavenworth.

EDWARD GUERRANT KELLEY, M.S., Associate Professor of Entomology, Division of College Extension (1918; Feb. 15, 1921).
B. S., University of Kentucky, 1903; M. S., ibid., 1904. F 76C; 804 Moro.

GRACE EMILY DERBY, A.B., Associate Librarian (1911, 1918).
A. B., Western College for Women, 1905. F. 32; 1825 Leavenworth.

JAMES WALKER MCCOLLOCH, B.S., Associate Professor of Entomology (1910; July 1, 1921); Associate Entomologist, Agricultural Experiment Station (1910, 1918).
B. S., 1912. F 76 D; 1626 Leavenworth.

HOWARD W. BRUBAKER, Ph.D., Associate Professor of Chemistry (1913, 1918).
B. S., Carleton College, 1899; Ph. D., University of Pennsylvania, 1904.
C 64; 1116 Fremont.

INA FOOTE COWLES, B.S., Associate Professor of Clothing and Textiles (1902, 1918).
B. S., 1901. L 55; 1212 Fremont.

HAROLD MORTON JONES, B.S., State Dairy Commissioner (1913, 1919).
B. S., Purdue University, 1908. X; 1609 Leavenworth.

CHARLES ELKINS ROGERS, A.B., Associate Professor of Industrial Journalism (1919).
A. B., University of Oklahoma, 1914. K 55; 532 N. Fourteenth.

RUDOLPH LOUIS HENSEL, B.S.F., Associate Professor of Pasture Management (1919).
B. S. F., Iowa State College, 1913. Ag 82; 831 Bluemont.

PERCY LEIGH GAINEY, A.M., M.S., Associate Professor of Bacteriology (1914, 1919); Soil Bacteriologist, Agricultural Experiment Station (1914).
B. Agr., North Carolina A. and M. College, 1908; M. S., ibid., 1910; A. M., Washington University, 1911. V. 26; 1123 Houston.

WILLIAM TIMOTHY STRATTON, A.M., Associate Professor of Mathematics (1910, 1919).
A. B., Indiana University, 1906; A. M., ibid., 1913. S. 55; R. F. D. 1.

ELDEN VALORIUS JAMES, A.M., Associate Professor of History and Civics (1912, 1919).
A. B., Marietta College, 1901; A. B., University of Michigan, 1905; A. M., Marietta College, 1908. F 1; 621 Humboldt.

WALTER GILLING WARD, B.S., Associate Professor of Rural Engineering, Division of College Extension (April 1, 1920).
B. S. in Arch., 1912. E 130; 905 Laramie.

1. Resigned.

WILMER ESLA DAVIS, A.B., Associate Professor of Botany (1909, 1920).
Graduate, Ohio Normal University, 1894; A. B., University of Illinois, 1903.
H 76; 1014 Vattier.

ADA RICE, M.S., Associate Professor of English (1899, 1920).
B. S., 1895; M. S., 1912. G 28; 917 Osage.

JOSEPH HENRY MERRILL, Ph.D., Associate Professor of Apiculture (1912, 1920); Assistant Entomologist, Agricultural Experiment Station (1912); State Apiarist (1915).
B. S., Dartmouth College, 1905; Ph. D., Massachusetts Agricultural College, 1914.
F 52; 626 Moro.

FORREST FAYE FRAZIER, C.E., Associate Professor of Civil Engineering (1911, 1920).
C. E., Ohio State University, 1910. E 123; 1815 Leavenworth.

MALCOLM CAMERON SEWELL, M.S., Associate Professor of Soils (1914, 1920).
B. S., 1912; M. S., Ohio State University, 1914. Ag 56; 530 N. Fourteenth.

ROYCE GERALD KLOEFFLER, B.S., Associate Professor of Electrical Engineering (1916, 1920).
B. S. in E. E., University of Michigan, 1913. E 120; 1218 Kearney.

CLINTON ELLICOTT PEARCE, S.B., Associate Professor of Machine Design (1917, 1920).
S. B., Massachusetts Institute of Technology, 1913. E 210; 615 N. Eleventh.

WILLIAM HENRY SANDERS, M.E., Associate Professor of Agricultural Engineering (1914, 1920).
B. S., 1890; M. E., 1916. R 27; 1208 Kearney.

HARRY WINFIELD CAVE, M.S., Associate Professor of Dairy Husbandry (1918, 1920).
B. S. A., Iowa State College, 1914; M. S., 1916. D 30; 1638 Osage.

EDGAR TALBERT KEITH, B.S., Associate Professor of Printing (1912, 1920).
B. S., 1912. K 3; 1421 Poyntz.

CHARLES WILLIAM COLVER, Ph.D., Associate Professor of Organic Chemistry (1919, 1920).
B. S., University of Idaho, 1909; M. S., ibid., 1911; Ph. D., University of Illinois, 1919.
C 64; 1635 Fairchild.

RALPH W. MORRISH, B.S.A., Associate Professor of Junior Extension, in Charge of Boys' and Girls' Club Work, Division of College Extension (July 15, 1920).
B. S. A., Purdue University, 1920. A 37; 1623 Anderson.

MARGARET MESSENGER EDWARDS, A.M., Associate Professor of Education (Sept. 1, 1920).
B. S., Montana University, 1912; A. M., Columbia University, 1920.
L 64; 900 Leavenworth.

ROY MONROE GREEN, B.S., Associate Professor of Agricultural Economics (Sept. 1, 1920).
B. S. in Agr., University of Missouri, 1914. Ag 51A; 912 Bertrand.

CHARLES HENRY SCHOLER, B.S., Associate Professor of Applied Mechanics (Oct. 1, 1920); Engineer of Tests in the Roads Materials Laboratory (Oct. 1, 1920).
B. S., 1914. E 111; 806 Bluemont.

LOYAL FREDERICK PAYNE, B.S., Associate Professor of Poultry Husbandry (Feb. 1, 1921).
B. S., Oklahoma A. and M. College, 1912. Ag 38A; 4 College Heights.

CARL G. ELLING,[2] B. S., Associate Professor of Animal Husbandry, Division of College Extension (1918; Feb. 15, 1921).
B. S., 1904. A 33; R. F. D. 1.

ALONZO FRANKLIN TURNER,[2] B. S., Associate Professor of Agricultural Extension (1917; Feb. 15, 1921); Assistant County Agent Leader, Division of College Extension (1917, 1920).
B. S., 1905. A 2; 810 Moro.

JAMES WALTER ZAHNLEY, B. S., Associate Professor of Farm Crops (1915; July 1, 1921).
B. S., 1909; B. S. in Agr., 1918. Ag 82; 1131 Laramie.

HARRY BURDETT WINCHESTER, M. S., Associate Professor of Animal Husbandry (1919; July 1, 1921).
B. S., Iowa State College, 1916; M. S., ibid., 1917. Ag 13; 1221 Laramie.

HEMAN LAURITZ IBSEN, Ph. D., Associate Professor of Genetics (1919; July 1, 1921).
B. S., University of Wisconsin, 1912; M. S., ibid., 1913; Ph. D., ibid., 1916.
Ag 15A; 1623 Anderson.

LOUIS HENRY LIMPER, A. M., Associate Professor of Modern Languages (1914; July 1, 1921).
A. B., Baldwin Wallace College, 1907; A. M., University of Wisconsin, 1914.
A 70; 1324 Laramie.

MARTHA S. PITTMAN, A. M., Associate Professor of Food Economics and Nutrition (1919; July 1, 1921).
B. S., 1906; B. S., Columbia University, 1916; M. S., ibid., 1918.
L 47; 112 S. Twelfth.

GEORGE GEMMELL, B. S., Acting Head of Department of Home-study Service, Division of College Extension (1918; February 1, 1922); Associate Professor of Agronomy, Division of College Extension (1918; July 1, 1921).
B. S., Kansas Manual Training Normal School, 1917; B. S., 1920.
A 5; 411 N. Sixteenth.

LOUIS COLEMAN WILLIAMS, B. S., Associate Professor of Horticulture, Division of College Extension (1915; July 1, 1921).
B. S., 1912. H 26; 1110 Vattier.

ROGER CLETUS SMITH, Ph. D., Associate Professor of Entomology (1920).
A. B., Miami University, 1911; A. M., Ohio State University, 1914; Ph. D., Cornell University, 1917. F 64; 1605 Leavenworth.

HILMER HENRY LAUDE, M. S., Associate Professor of Agronomy (1920; July 1, 1921).
B. S., 1911; M. S., Texas A. and M. College, 1918. Ag 60; 1006 Laramie.

JOSEPH PRESTWICH SCOTT,[5] D. V. M., Associate Professor of Pathology (1916; July 1, 1921).
B. S., Scientific Gymnasium, Lsusanne, Switzerland, 1910; D. V. M., Ohio State University, 1914. V 2; 1605 Leavenworth.

WILLIAM MAX MCLEOD, D. V. M., Associate Professor of Anatomy (1919; July 1, 1921).
D. V. M., Iowa State College, 1917. V 32; 413 Houston.

EDWIN JACOB FRICK, D. V. M., Associate Professor of Medicine (1919; July 1, 1921).
D. V. M., Cornell University, 1917. V 32; 1016 Osage.

2. In coöperation with the U. S. Department of Agriculture.
5. Absent on leave, October 1, 1921, to August 31, 1922.

CHARLES A. CHAPMAN, Major C. A. C., U. S. A., Associate Professor of Military Science and Tactics (1920; July 1, 1921).
B. S., United States Military Academy, 1910. N 26; 301 Bluemont.

CHARLES WALTON MATTHEWS, B. S., Associate Professor of English (1920; July 1, 1921).
B. S., Kansas State Manual Training Normal School, 1918. A 65A; 1409 Anderson.

HAROLD PARKER WHEELER, Associate Professor of Orchestral and Band Instruments (1919; July 1, 1921); Band Leader (1919).
M 29; 1123 Laramie.

CHARLES WILLIAM BACHMAN, LL. B., Associate Professor of Physical Education (1920; September 1, 1921); Head Coach of Athletics (1920).
LL. B., Notre Dame University, 1917. N 35; 1409 Anderson.

NORMAN EVERETT OLSON, B. S., Associate Professor of Dairy Husbandry (September 1, 1921).
B. S., Iowa State College, 1915. D 30; 309 N. Sixteenth.

HUGH EVERETT ROSSEN, B. S., LL. B., Associate Professor of English (December 15, 1921).
B. S., Knox College, 1916; LL. B., University of Iowa, 1920.
A 59; 1409 Anderson.

ASSISTANT PROFESSORS

EDGAR LEMUEL TAGUE, A. M., Assistant Professor of Chemistry (1914); Assistant in Protein Chemistry, Agricultural Experiment Station (1914).
A. B., University of Kansas, 1908; A. M., ibid., 1909. C 3; 618 N. Manhattan.

WALTER LEROY LATSHAW, B. S., Assistant Professor of Chemistry (1914, 1918).
B. S., Pennsylvania State College, 1912. C 3; 917 Fremont.

PAUL PORTER BRAINARD, A. M., Assistant Professor of Education, Division of College Extension (1919, 1920).
B. L., Whitman College, 1909; A. M., Columbia University, 1913.
A 5; 1224 Thurston.

FREDERICK LEE HISAW, A. M., Assistant Professor of Zoölogy (1919); Mammalogist, Agricultural Experiment Station (1919).
A. B., University of Missouri, 1914; B. S., ibid., 1915; A. M., ibid., 1916.
F 54A; 1622 Osage.

ARTHUR FREDERICK PEINE, A. M., Assistant Professor of History and Civics (1913, 1919).
A. B., Illinois Wesleyan University, 1911; A. M., University of Illinois, 1913.
F 4; 323 N. Fifteenth.

FLORENCE MABELLE HEIZER, A. B., Assistant Professor of English (1918, 1919).
A. B., Bethany College, 1907; A. B., University of Kansas, 1910.
A 53; 703 Poyntz.

WILLIAM RAYMOND BRACKETT, A. B., Assistant Professor of Physics (1919).
A. B., University of Colorado, 1905. C 38; 1824 Humboldt.

EDWARD CHAPMAN CONVERSE, A. M., Assistant Professor of Physics (1919).
A. B., University of Illinois, 1904; A. M., ibid., 1909. C 57; College Hill.

FRANK CALEB GATES, Ph. D., Assistant Professor of Botany (1919).
A. B., University of Illinois, 1910; Ph. D., University of Michigan, 1912.
H 57; 1515 Humboldt.

ELMER LAMONT RHOADES, B. S., Assistant Professor of Farm Management, Division of College Extension (1919; Feb. 15, 1921).
B. S., University of Missouri, 1916. A 2; 512 Houston.

ALLAN PARK DAVIDSON, B.S., Assistant Professor of Education (1919); Principal, Vocational School (1919; July 1, 1920).
B. S., 1914. G 29; 1200 Bertrand.

ROY WILLIAM KISER,[2] B.S., Assistant Professor of Animal Husbandry, Division of College Extension (1918; Feb. 15, 1921).
B. S., 1914. A 34; 1715 Laramie.

THOMAS ARTHUR CASE, D.V.M., Assistant Professor of Veterinary Medicine, Division of College Extension (1918, 1921).
D. V. M., 1912. V 24; 1324 Laramie.

FLOYD PATTISON, B.S., Assistant Professor of Steam and Gas Engineering, Division of College Extension (1919, 1921).
B. S., 1912. A 5; 805 Kearney.

FRANK ANDREW DAWLEY, B.S., Assistant Professor of Agricultural Extension (1917, 1921); Assistant County Agent Leader, Division of College Extension (1917, 1920).
B. S., 1895. A 2; 303 N. Fourteenth.

DANIEL EMMETT LYNCH, Assistant Professor of Forging (1914, 1920); Foreman of Blacksmith Shop (1914).
S 38; 1729 Laramie.

EDWARD C. JONES, B.M.E., Assistant Professor of Shop Practice (1916, 1920); Foreman of Machine Shop (1916).
B. M. E., Iowa State College, 1905. S 31; 1011 Kearney.

MANFORD W. FURR, B.S., Assistant Professor of Civil Engineering (1917, 1920).
B. S. in C. E., Purdue University, 1913. E 122; 111 S. Eleventh.

MARGARET RUSSEL,[4] A.M., Assistant Professor of English (1917, 1920).
A. B., Washburn College, 1913; A. M., Columbia University, 1915.
A 54; 1212 Fremont.

ELSIE HARRIET SMITH, Assistant Professor of Music (1917; July 1, 1920).
Graduate, Certificate Course, Chicago Musical College, 1909; Postgraduate Certificate, Institute of Musical Art, New York City, 1914. M 58; 1318 Fremont.

ALBERT JOHN MACK, M.E., Assistant Professor of Steam and Gas Engineering (1917; July 1, 1920).
B. S., 1912; M. E., 1921. E 109; 1512 Poyntz.

HERBERT HENLEY HAYMAKER, M.S., Assistant Professor of Botany (1917; July 1, 1920).
B. S., 1915; M. S., University of Wisconsin, 1916. H 54; 315 N. Sixteenth.

LEON VINCENT WHITE, C.E., Assistant Professor of Civil Engineering (1918; July 1, 1920).
B. S., 1903; C. E., 1918. E 122; 1800 Anderson.

CLIFF ERRETT AUBEL, M.S., Assistant Professor of Animal Husbandry (1919; July 1, 1920).
B. S., Pennsylvania State College, 1915; M. S., 1917. Ag 13; 1506 Poyntz.

JULES HENRY ROBERT, B.S., Assistant Professor of Applied Mechanics (1916; July 1, 1920).
B. S., University of Illinois, 1914. E 112; 1409 Anderson.

GABE ALFRED SELLERS, B.S., Assistant Professor of Shop Practice (1919; July 1, 1920).
B. S., 1917. S 62; 1001 Kearney.

2. In coöperation with the U. S. Department of Agriculture.
4. Absent on leave, 1921-'22.

ALFRED LESTER CLAPP, B. S., Assistant Professor of Agricultural Extension; Assistant County Agent Leader, Division of College Extension (Sept. 1, 1920; Feb. 15, 1921).
B. S., 1914. A 2; 930 Kearney.

MIRIAM ELLIOTT CLAY, A. B., Head of Circulation Department, College Library (Sept. 1, 1920).
A. B., Smith College, 1910. F 27; 1423 Fairchild.

ELIZABETH HAMILTON DAVIS, A. B., B. L. S., Reference Librarian (Sept. 1, 1920).
A. B., Illinois Women's College, 1909; B. L. S., University of Illinois, 1914.
F 35; 421 N. Sixteenth.

LAWRENCE WILLIAM HARTEL, B. S., Assistant Professor of Physics (1920).
A. B., Central Wesleyan College, 1911; B. S., ibid., 1912; B. S. in Ed., University of Missouri, 1915. C 34; 1709 Laramie.

ERVIN ARTHUR KNOTH, G. G., Assistant Professor of Physical Education (1920).
Graduate Gymnast, Normal College of American Gymnastic Union, 1917.
N 35; 821 Poyntz.

AMY-JANE LEAZENBY, A. M., Assistant Professor of Household Economics (1920).
B. S., University of Missouri, 1917; A. M., University of Chicago, 1920.
L 41; 1641 Laramie.

IGNATIUS ALBERT WOJTASZAK, B. S., Assistant Professor of Applied Mechanics (1920).
B. S., University of Michigan, 1920. E 53; 1623 Anderson.

JESSE LAMAR BRENNEMAN, E. E., Assistant Professor of Electrical Engineering (1920).
B. S., University of Chicago, 1908; E. E., University of Wisconsin, 1913.
E 120; College Heights.

BERNARD MARTIN ANDERSON, B. S., Assistant Professor of Animal Husbandry (1920).
B. S., 1916. Ag 13; 323 Yuma.

EARLE REED DAWLEY, B. S., Assistant Professor of Applied Mechanics, and Assistant Engineer of Tests (1920).
B. S., University of Illinois, 1919. E 16; 1107 Colorado.

RUTH MARIE ELIZABETH HENNIG, B. S., Head Cataloguer, College Library (1921).
B. S., Simmons College, 1920. F 27; 930 Laramie.

MINNIE SEQUIST, A. B., Assistant Professor of Clothing and Textiles, Division of College Extension (1916, 1921).
A. B., Kansas State Normal School; Graduate, Stout Institute, 1916.
A 36; 1020 Leavenworth.

SUSANNA SCHNEMAYER, B. S., Assistant Professor of Food Economics and Nutrition, Division of College Extension (1917, 1921).
B. S., 1909. A 36; 512 N. Ninth.

GEORGE W. SALISBURY, B. S., Assistant Professor of Agricultural Extension; Assistant County Agent Leader, Division of College Extension (1919; Feb. 15, 1921).
B. S., University of Illinois, 1915. A 2; 312 N. Sixteenth.

CAMPBELL NELSON JACKSON, Capt. Inf., U. S. A., Assistant Professor of Military Science and Tactics (Feb. 6, 1921).
N 27; 215 N. Fifth.

KATHERINE KIMMEL, Assistant Professor of Voice (1917; July 1, 1921).
Graduate, Battle Creek (Mich.) Conservatory of Music, 1913.
M 52; 535 N. Manhattan Ave.

BESS JANE MCKITTRICK, A. B., Assistant Professor of Mathematics (1918; July 1, 1921).
A. B., University of Kansas, 1912. G 28A; 1212 Fremont.

WILLIAM FRANCIS PICKETT, B. S., Assistant Professor of Horticulture (1917; July 1, 1921).
B. S., 1917. H 30; 923 Laramie.

FLOYD ALONZO SMUTZ, B. S., Assistant Professor of Machine Design (1918; July 1, 1921).
B. S. in Arch., 1914. S 63; 1524 Humboldt.

HELEN MABEL HANNEN, Assistant Professor of Violin (1919; July 1, 1921).
Graduate, Malek School of Music, Grand Rapids, Mich., 1917; Graduate, Department of Public School and Community Music, Northwestern University, 1919.
M 53; 1636 Fairchild.

MERRILL AUGUSTUS DURLAND, B. S., Assistant Professor of Mechanical Drawing (1919; July 1, 1921).
B. S., 1918. E 209; 1329 Anderson.

NORTON LEWIS HARRIS, Instructor in Poultry Husbandry, Division of College Extension (1920; July 1, 1921).
Ag 38A; 901 Kearney.

CHARLES HOWARD KITSELMAN, V. M. D., Assistant Professor of Pathology (1919; July 1, 1921).
V. M. D., University of Pennsylvania, 1918. V 28; 1821 Leavenworth.

WILLIAM TRUMAN CRANDALL, M. S., Assistant Professor of Dairy Husbandry, Division of College Extension (1920; July 1, 1921).
B. S., Milton College, 1906; B. S. A., University of Wisconsin, 1909; M. S., University of Illinois, 1913. D 34; 1005 Vattier.

RUDOLPH H. DRIFTMIER, B. S., Assistant Professor of Agricultural Engineering (1920; July 1, 1921).
B. S. in A. E., Iowa State College, 1920. E 216; 918 Thurston.

HELEN ELIZABETH ELCOCK, A. M., Assistant Professor of English (1920; July 1, 1921).
A. B., College of Emporia, 1907; A. M., University of Chicago, 1921.
A 55; 1425 Laramie.

EMMA HYDE, A. M., Assistant Professor of Mathematics (1920; July 1, 1921).
A. B., University of Kansas, 1912; A. M., University of Chicago, 1916.
G 28; 327 N. Fifteenth.

CLARENCE FLAVIUS LEWIS, A. B., Assistant Professor of Mathematics (1920; July 1, 1921).
A. B., University of Denver, 1913. S 55; 1815 Humboldt.

BOYD RILEY RINGO, Assistant Professor of Piano (1920; July 1, 1921).
Graduate, Cincinnati Conservatory of Music, 1918. M 51; 307 N. Sixteenth.

ANNA MARIE STURMER, A. M., Assistant Professor of English (1920; July 1, 1921).
A. B., University of Nebraska, 1917; A. M., ibid., 1920. A 53; 337 N. Fourteenth.

ERNEST BLAINE WELLS, B. S. A., Assistant Professor of Soils, Division of College Extension (1920; July 1, 1921).
B. S. A., West Virginia University, 1917. Ag 59; 109 N. Ninth.

WILLIAM SHAFFRATH WIEDORN, M.L.D., Assistant Professor of Landscape Gardening (1920; July 1, 1921).
B. S., Cornell University, 1919; M. L. D., ibid., 1921. H 33; 1011 Fremont.

JOHN JASPER BAYLES, B.S., Assistant Professor of Farm Crops (1918; July 1, 1921).
B. S., 1915. Ag —; 1019 Moro.

ROBERT GORDON, Assistant Professor of Music (Feb. 1, 1921; July 1, 1921).
Diploma in Theory and Band Instruments, School of Music, University of Michigan, 1920.
M 4; 227 Houston.

ELLIS ADOLPH STOKDYK, B.S., Assistant Professor of Plant Pathology, Division of College Extension (Feb. 15, 1921; July 1, 1921).
B. S., University of Wisconsin, 1920. H 56; 714 Poyntz.

WILLIAM PATRICK HAYES, M.S., Assistant Professor of Entomology (1913; July 1, 1921).
B. S., 1913; M. S., 1918. F 76C; 1725 Anderson.

NATHAN DANIEL HARWOOD, D.V.M., Assistant Professor, Department of Vaccine Laboratories (1918; July 1, 1921).
D. V. M., 1918. V 32; 340 N. Sixteenth.

NEIL EDWIN DALE, B.S., Assistant Professor of Coöperative Experiments (1920; July 1, 1921).
B. S., 1918. Ag 60; 1507 Leavenworth.

LOUISE TAUSCHE, Assistant Professor and Director of Physical Education for Women (1920; Sept. 1, 1921).
Graduate, Sargent School for Physical Education, 1920. N 1; 1425 Laramie.

HAROLD A. BARR, B.S., Assistant Professor of Structural Design (Sept. 1, 1921).
B. S. in C. E., University of Colorado, 1919. E 304; 905 Fremont.

EFFIE MAY CARP, A.M., Assistant Professor of Household Economics and Director of Cafeteria (Sept. 1, 1921).
B. S., 1915; A. M., University of Chicago, 1921. K 30; 1425 Laramie.

GUY SHIRMER COOK, A.M., Assistant Professor of Physics (Sept. 1, 1921).
A. B., University of Missouri, 1912; A. M., University of Wisconsin, 1919.
C 57; 615 Leavenworth.

EDWIN CHARLES CURTISS, Ph.B., Assistant Professor of Physical Education (Sept. 1, 1921).
Ph. B., University of Chicago, 1921. N 35; 1324 Laramie.

CHARLES DEFOREST DAVIS, B.S., Assistant Professor of Farm Crops (Sept. 1, 1921).
B. S., 1921. Ag 79; 609 N. Ninth.

WILLIAM LINDQUIST, Assistant Professor of Voice (Sept. 1, 1921).
Graduate, Cosmopolitan School of Music and Dramatic Art, Chicago.
MA 1; 1201A Moro.

PAUL LEROY MANN, B.S., Assistant Professor of Milling Industry (Sept. 1, 1921).
B. S. in Milling Industry, 1918. Ag 40; 501 Pierre.

PEARLE ETHEL RUBY, M.S., Assistant Professor of Food Economics and Nutrition (Sept. 1, 1921).
A. B., Drake University, 1915; M. S., University of Chicago, 1920.
L 35; 1412 Leavenworth.

PAUL WEIGEL, B.Arch., Assistant Professor of Architecture (Sept. 1, 1921).
B. Arch., Cornell University, 1912; Graduate, Buffalo Normal School, 1921.
E 304; 1204 Fremont.

THOMAS EDWARD DUNN, B. S. M. E., Assistant Professor of Shop Practice (Oct. 24, 1921).
B. S. M. E. and B. S. E. E., Rose Polytechnic Institute, 1915. S 62; 931 Leavenworth.

DON RICHMAN NORRIS, Capt. C. A. C., U. S. A., Assistant Professor of Military Science and Tactics (Nov. 8, 1921).
N 26; 821 Humboldt.

ASSOCIATES

HOWARD ROBERT DEROSE, A. B., Associate in Food Analysis (1919).
A. B., University of Colorado, 1918. CA 30; 805 Houston.

RUSSELL NEWTON LOOMIS, B. S. Phar., Associate in Feed-stuffs Analysis (Oct. 25, 1920).
Ph. C., University of Colorado, 1915; B. S. Phar., ibid, 1917. CA 30; 829 Fremont.

INSTRUCTORS

GEORGE WILLIAM BROWER, First Lieut., U. S. A., Instructor in Military Science and Tactics (1920; July 1, 1921).
D. V. M., Kansas City Veterinary College, 1913. V 27; 1207 Houston.

WILLIAM LEONARD HOUSE,[6] Instructor in Woodwork (1909-Nov. 23, 1921).

EDWARD GRANT, Instructor in Molding (1913); Foreman of Foundry (1913).
S 42; 1733 Laramie.

INA EMMA HOLROYD, B. S., Instructor in Mathematics (1900, 1904).
B. S., 1897; B. S., Kansas State Normal School, 1916. G 28; 1001 Moro.

EMMA FLORA FECHT, Instructor in Clothing and Textiles (1913, 1914).
Graduate, Bradley Polytechnic Institute, 1912. L 55; 315 N. Sixteenth.

WILMA OREM,[4] A. M., Instructor in History and Civics (1917).
B. S., 1910; A. M., University of Michigan, 1916. G 28; 413 Denison.

EDWARD STAUNTON WEST, M. S., Instructor in Chemistry (1917, 1918).
A. B., Randolph Macon College, 1917; M. S., 1920. C 64; 931 Bluemont.

STELLA MAUDE HARRISS, M. S., Instructor in Chemistry (1917, 1918).
B. S., 1917; Graduate, (Peru) Nebraska State Normal School, 1908; M. S., 1919.
W 26; 804 Moro.

NORA ELIZABETH DALBEY, A. M., Instructor in Botany (1918).
A. B., University of Kansas, 1913; A. M., ibid., 1914. H 54; 350 N. Sixteenth.

ODESSA DELLA DOW,[4] B. S., Instructor in Chemistry (1918).
B. S., 1906. C 64; R. F. D. 1.

ERNEST BAKER KEITH, B. S., Instructor in Chemistry (1918).
B. S., 1913. W 26; 1031 Humboldt.

IZIL ISABEL POLSON, B. S., Instructor in Industrial Journalism (1918).
B. S., 1914. K 59; 904 Bluemont.

KATHERINE MAXWELL BOWER, B. S., Instructor in English (1918; 1919).
B. S., 1915. A 54; 510 N. Ninth.

HERBERT C. STROM, Instructor in Automobiles (1918, 1919).
S 62; 1209 Poyntz.

AUBREY DEAKENS CONROW, B. S., Assistant Engineer of Tests, Materials of Construction Laboratory, Engineering Experiment Station (1919).
B. S., 1913. E 16; R. F. D. 1.

4. Absent on leave, 1921-'22.
6. Deceased.

W. PEARL MARTIN, R. N., Instructor in Home Nursing, Division of College Extension (1919).
Graduate, Christ Hospital, Topeka. A 36; 1231 Clay St., Topeka.

HARRY WORKMAN AIMAN, A. B., Instructor in Carpentry (1918, 1919).
A. B., Oskaloosa College, 1921. S 29B; 1001 Leavenworth.

FRED ROBERT BEAUDETTE, D. V. M., Instructor in Bacteriology (1919).
D. V. M., 1919. V 53; 1025 Bluemont.

S. FRED PRINCE, Biological Artist (1918, 1919).
I; 925 Thurston.

WILBUR NIELSON SKOURUP,[1] B. S., Instructor in Chemistry (1919-Oct. 8, 1921).
B. S., 1915; A. B., University of Kansas, 1916.

MARY FIDELIA TAYLOR, B. S., Instructor in Physics (1919).
B. S., 1919. C 36; 350 N. Sixteenth.

ANDREW WINTER, Instructor in Automobiles (1919).
E 52A; 1200 Bertrand.

EUGENE SIDNEY LYONS, B. S., Instructor in Soils (1920); Foreman of Agronomy Farm (July 1, 1921 - April 1, 1922).
B. S., 1921. Ag 55; R. R. 8.

CHARLES REESE GEARHART, B. S., Instructor in Dairy Husbandry, Division of College Extension (1920).
B. S., University of Missouri, 1920. D 31; 1623 Anderson.

CLAUDE GUSTAVE HANSEN, B. S. in M. E., Instructor in Shop Practice (1920).
B. S. in M. E., 1920. S 31; 827 Leavenworth.

ALENE HINN, B. S., Instructor in Junior Extension, Division of College Extension (1920).
B. S., University of Wisconsin, 1918. A 35; 1220 Leavenworth.

GRACE ROBERTA HESSE, A. B., Instructor in Modern Languages (1917, 1920).
A. B., University of Michigan, 1917. N 61; 1318 Fremont.

MARY ABBIE WORCESTER, B. S., Instructor in Clothing and Textiles (1919, 1920).
B. S., New Hampshire College, 1917. L 65; 1318 Fremont.

STANLEY PAUL HUNT, B. S., Instructor in Applied Mechanics (1920).
B. S., 1919. E 209; 522 Vattier.

RETA HAZEL DIELMANN,[4] A. M., Instructor in History and Civics, Division of College Extension (1920).
A. B., University of Kansas, 1917; A. M., ibid., 1920. A 5; 337 N. Fourteenth.

SIDNEY ALBERT WILSON, Sergt., U. S. A., Instructor in Military Training (1920).
N 26; 716 Moro.

LOUISE HELEN EVERHARDY, Instructor in Applied Art (1919, 1920).
A 67B; 1110 Vattier.

MARY ISABEL SCHELL, Instructor in Clothing and Textiles (1919, 1920).
Normal Graduate, Art Institute, Chicago, 1919. A 67; 535 N. Manhattan.

MORRIS EVANS, B. S., Instructor in Agricultural Economics (1920).
B. S. in Agr., 1920. Ag 51A; 1601 Poyntz.

HUBERT BINGHAM BECKWITH, B. S. in E. E., Instructor in Electrical Engineering (Sept. 1, 1920).
B. S. in E. E., Georgia Institute of Technology, 1912. E 24; 1709 Laramie.

1. Resigned.
4. Absent on leave, 1921-'22.

CHARLES JOHN BRADLEY, B.S. in M.E., Instructor in Mechanical Engineering (Sept. 1, 1920).
B. S. in M. E., Purdue University, 1920. E 109; 812 Laramie.

HELEN MARTIN COLBURN, Instructor in Piano (1920).
Mus. B., 1921. MA 2; 605 Leavenworth.

WALTER LEONARD DEHNER, B.S., Instructor in Architecture (1920).
B. S., University of Illinois, 1919. E 308; 1324 Laramie.

ANNABEL ALEXANDER GARVEY, A.M., Instructor in English (1920).
A. B., Wellesley College, 1912; A. M., University of Kansas, 1914.
A 57A; 1425 Laramie.

KATHERINE HUDSON, B.S., Instructor in Food Economics and Nutrition (1920).
B. S., University of Wisconsin, 1918. L 34; 1641 Fairchild.

IRENE MEYERS HUSE, B.S., Instructor in Zoölogy (Sept. 1, 1920).
B. S., New Hampshire College, 1918. F 61; 931 Bluemont.

FANNY MARGARET KELLER, Mus.D., Instructor in Piano (1920).
Mus. G., Northwestern University, 1920. MA 9; 1725 Fairchild.

ETHEL BEATRICE ROBINSON, B.S., Instructor in Music (1920).
B. S., Fort Hays Branch State Normal School, 1920. M 4; 900 Leavenworth.

JAMES BOYLES ROGERS, A.M., Instructor in Zoölogy (1920).
A. B., University of Kansas, 1916; A. M., ibid., 1917. F 62; 1623 Anderson.

HELEN DOROTHY RUSHFELDT, A.M., Instructor in English (1920).
A. B., University of Minnesota, 1915; A. M., Columbia University, 1920.
G 28B; 1641 Fairchild.

WINIFRED KATHERINE ST. JOHN, B.S., Assistant Reference Librarian (1920).
B. S., Simmons College, 1920. F 35; 930 Laramie.

MILDRED RUTH TACKABERRY, M.S., Instructor in Food Economics and Nutrition (1920).
A. B., Morningside College, 1916; M. S., University of Chicago, 1921.
L 34; 1318 Fremont.

GLADYS ETHELWYNNE WARREN, Mus.B., Instructor in Piano (1920).
Mus. B., Lake Erie College, 1919; Graduate, New England Conservatory of Music, 1918.
MA 6; 1725 Fairchild.

WILLIAM MCCLINTOCK, First Sergt., U. S. A., Instructor in Military Training (1920).
N 26; 400 Houston.

MARION COFFEE, First Sergt., U. S. A., Instructor in Military Training (1920).
N 26; 418 S. Fourth.

HAROLD REED GUILBERT, B.S., Instructor in Agriculture (1920).
B. S., 1920. G 29; 412 Fremont.

ESTHER BRUNER, B.S., Instructor in Chemistry (1920).
B. S., 1920; M. S., 1921. W 26; 1638 Osage.

HENRY JOSEPH BOWHAY, Instructor in Shop Practice (Nov. 15, 1920).
S 31; 931 Thurston.

NEVELS PEARSON,[1] B.S., Instructor in Junior Extension, Division of College Extension (Jan. 1, 1921; Feb. 15, 1921 - Mar. 15, 1922).
B. S., 1920. 1623 Anderson.

DAVID MACKINTOSH, B.S., Instructor in Animal Husbandry (1921).
B. S., University of Minnesota, 1920. Ag 13M; 315 Denison.

1. Resigned.

HARRIET WRIGHT ALLARD, Instructor in Household Economics, Division of College Extension (1917, 1921).
A 36; 1115 Laramie.

LUTHER EARL WILLOUGHBY, B.S., Instructor in Farm Crops, Division of College Extension (1917, 1921).
B. S., 1912; B. S. in Agr., 1916. Ag 1623 Anderson.

EDWARD GRANELL, Instructor in Shop Practice (1919; July 1, 1921).
S 38; 809 Vattier.

RUTH KATHRYN TRAIL, B.S., Instructor in Food Economics and Nutrition (1919; July 1, 1921).
B. S., Connecticut College for Women, 1919. L 47; 1318 Fremont.

DOROTHY JOSEPHINE CASHEN, M.S., Instructor in Botany (1919; July 1, 1921).
B. S., Carthage College, 1917; M. S., 1920. H 57; 900 Leavenworth.

RAYMOND BROWN BECKER, M.S., Instructor in Dairy Husbandry (1920; July 1, 1921).
B. S., Iowa State College, 1916; M. S. in A. H., ibid., 1920. D 30; 1623 Anderson.

PAUL CAMPBELL MCGILLIARD, B.S., Instructor in Dairy Husbandry (1920; July 1, 1921).
B. S., 1916. D 30; 915 Kearney.

ETHEL HASSINGER, Instructor in Violin (1920; July 1, 1921).
M 52; 605 Leavenworth.

WALTER BUSWELL BALCH, B.S., Instructor in Horticulture, and Greenhouse Foreman (Feb. 1, 1921; July 1, 1921).
B. S., Cornell University, 1919. H 33; 1623 Anderson.

HENRY WHITE MARSTON, B.S.A., Instructor in Animal Husbandry (1919; July 1, 1921).
B. S. A., Delaware State College, 1919; M. S., 1921. Ag 13; 1020 Leavenworth.

EDGAR MCCALL AMOS, B.S., Instructor in Industrial Journalism and Printing (1920; July 1, 1921).
B. S., 1902. K 2; 1015 Leavenworth.

CHAUNCEY ELIAS SAWYER, D.V.M., Instructor in Pathology (Aug. 1, 1921).
D. V. M., 1921. V 55A; 1416 Humboldt.

ALBERT JOSEPH SCHOTH, B.S., Instructor in Junior Extension, Boys' and Girls' Club Work (Aug. 10, 1921).
B. S., Oregon Agricultural College, 1918. A 35; 1623 Anderson.

NELLIE ABERLE, M.S., Instructor in English (Sept. 1, 1921).
B. S., 1912; M. S., 1914. A 54; R. R. 1.

HAROLD ALLEN, B.S., Instructor in Applied Mechanics (Sept. 1, 1921).
B. S. in C. E., University of Colorado, 1920. E 113; 112 S. Eleventh.

ADA GRACE BILLINGS,[3] B.S., Instructor in History and Civics, Home-study Service (Sept. 1, 1921 - Aug. 31, 1922).
B. S., 1916. A 5; 714 Moro.

CLARA BOGUE,[3] A.M., Instructor in English (Sept. 1, 1921).
B. S. in Ed., Kansas State Normal School, 1919; A. M., University of Chicago, 1921. G 37; Moehlman Bottom.

EDNA M. ELLIS, Instructor in Voice (Sept. 1, 1921).
Certificate, Public-school Music Methods, DePauw University, 1919.
MA 3; 814 Osage.

3. Temporary appointment.

RAY FLAGG, B.S., Instructor in Shop Practice (Sept. 1, 1921).
B. S. in E. E., Purdue University, 1905. S 62; 903 Houston.

RUTH EVELYN FORISTALL, A.B., B.M., Instructor in Piano (Sept. 1, 1921).
A. B., Kansas Wesleyan University, 1910; B. M., ibid., 1913.
MA 6; 900 Leavenworth.

OTIS IRVIN GRUBER, Instructor in Voice (Sept. 1, 1921).
Graduate, Knox Conservatory of Music, 1918. MA; 1623 Anderson.

CECIL AGUILA GUNNS, Instructor in Zoölogy (Sept. 1, 1921).
F 76A; 315 Denison.

RAY EDWARD HOLCOMBE,[3] Instructor in Public Speaking (Sept. 1, 1921).
A. B., University of Wisconsin, 1920. G 53; 1201 Moro.

EDITH ADRIANCE HOWARTH,[1] Instructor in English, Home-study Service (Sept. 1, 1921 - Dec. 31, 1921).
A. B., University of Kansas, 1916. A 5; 1315 Houston.

ERIC ROSS LYON, A.B., Instructor in Physics (Sept. 1, 1921).
A. B., Phillips University, 1911. C 39; 1709 Laramie.

DELOS MARQUIS PALMER, B.S., Instructor in Electrical Engineering (Sept. 1, 1921).
B. S. in E. E., University of Michigan, 1921. E 24; 734 Laramie.

JAMES EDWARD PAYNE, M.S., Vocational Instructor, U. S. Veterans' Bureau (Sept. 1, 1921).
B. S., 1887; M. S., 1896. G 55; 1400 Poyntz.

MARY LOUISE PRICE,[1] M.S., Instructor in Chemistry (Sept. 1, 1921 - Dec. 22, 1921).
B. S., 1916; M. S., Iowa State College, 1921.

ARTHUR DANIEL RICE,[3] Ph.D., Instructor in History and Civics (Sept. 1, 1921).
B. S., 1892; Ph. D., Chicago Law School, 1916. G 28B; 907 Leavenworth.

JACK RUBENSTYNE, B.S., Instructor in Mechanical Drawing (Sept. 1, 1921).
B. S., University of Wisconsin, 1921. S 63; 1623 Anderson.

EDGAR O. SLATER, Instructor in Shop Practice (Sept. 1, 1921).
S 26; 316 Laramie.

MARY ORLENA SPAFFORD,[1] B.S., R.N., Instructor in Household Economics (Sept. 1, 1921 - Dec. 31, 1921).
B. S., University of Wyoming, 1917; Graduate, Johns Hopkins University Hospital Training School for Nurses.

MARION W. TODD, B.S., (in C.E.), Instructor in Civil Engineering (Sept. 1, 1921).
B. S. in C. E., Purdue University, 1921. E 220; 1623 Anderson.

ROBERT EDWARD WILKIN, M.S., Instructor in Chemistry (Sept. 1, 1921).
B. S., Denison University, 1920; M. S., University of Iowa, 1921.
W 26; 1623 Anderson.

ARTHUR BRADLEY SPERRY, B.S., Instructor in Zoölogy (Sept. 12, 1921).
B. S., University of Chicago, 1919. F 62; 1623 Anderson.

ARTHUR C. FAY, M.S., Instructor in Bacteriology (Oct. 1, 1921).
B. S., University of Missouri, 1920; M. S., University of Wisconsin, 1921.
V 28; 831 Laramie.

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1. Resigned.
3. Temporary appointment.

HUBERT ALOYSIUS MCNAMEE,[3] Instructor in Traction Engines (Oct. 1, 1921).
Graduate, Air Service Mechanics School, 1918. R 54; 630 Moro.

CHARLES NITCHER, B.S., Instructor in Animal Husbandry, Home-study Service (Oct. 1, 1921).
B. S., 1921. A 5; 415 N. Sixteenth.

WILLIAM PRESTON SHULER,[3] M.S., D.V.M., Instructor in Pathology (Oct. 1, 1921 - Aug. 31, 1922).
D. V. M., 1910; M. S., 1912. V 2; 1320 Fremont.

JESSE EARL SELLERS, B.S., Instructor in Chemistry (Oct. 10, 1921).
B. S., University of Colorado, 1921. C 64; 1623 Anderson.

JOHN EDGAR EDGERTON,[3] B.Ped., Instructor in Mathematics (Oct. 10, 1921 - June 1, 1922).
B. Ped., Kansas Wesleyan University, 1897. S 56; 1010 Vattier.

GEORGE BENSON WATKINS, B.S., Instructor in Chemistry (Oct. 10, 1921).
B. S. in Ch. E., University of Michigan, 1921. W 26; 1623 Anderson.

ELLEN MARGARET BATCHELOR, B.S., Assistant Home Demonstration Leader (Nov. 1, 1921).
B. S., 1911. A 36; 817 Poyntz.

JAMES VERNE COLE, First Lieut. Inf., U. S. A., Instructor in Military Science and Tactics (Nov. 9, 1921).
N 27; 411 N. Fifteenth.

JOSEPHINE PERRY PEINE,[7] B.S., Instructor in Food Economics and Nutrition (Nov. 14, 1921).
B. S., Simmons College, 1914. L 34; 323 N. Fifteenth.

HARRY JAMES BEATTIE, M.S., Instructor in Chemistry (Jan. 1, 1922).
A. B., University of Denver, 1914; A. M., ibid., 1915; M. S., University of Illinois, 1917.
W 26; 816 Osage.

CONSTANCE SYBIL CLAPP, R.N., Instructor in Household Economics (Feb. 1, 1922).
Graduate, Stevens Point (Wis.) Normal School; Graduate in Nursing, University of Minnesota, 1921. L 28; Charlotte Swift Hospital.

HELEN MAUD HOLCOMBE,[3] A.B., Instructor in Public Speaking (Feb. 1, 1922 - June 1, 1922).
A. B., University of Wisconsin, 1920. G 56; 1201 Moro.

GENEVIEVE POTTER, B.S., Instructor in Food Economics and Nutrition, Division of College Extension (Feb. 1, 1922).
B. S., Oregon Agricultural College, 1916. A 36; 1115 Laramie.

JEREMIAH THOMAS QUINN, B.S., Instructor, Home-study Service (Feb. 2, 1922).
B. S., 1922. A 5; 910 Bluemont.

ARCHIBALD ALEXANDER GLENN,[3] B.S., Instructor in Horticulture, Division of College Extension (Mar. 1, 1922 - May 31, 1922).
B. S., 1916.

HOWARD HAROLD STEUP, B.S., Vocational Instructor in Poultry Husbandry (Mar. 1, 1922).
B. S., Purdue University, 1919. Ag 38A; 1623 Anderson.

ROBERT HENRY LUSH,[3] B.S., Instructor in Dairy Husbandry (April 1 to 30, 1922).
B. S., 1921.

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3. Temporary appointment.
7. Part time and temporary.

ASSISTANTS

JESSIE GULICK, Assistant Cataloguer in Library (1907, 1911).
F 27; 421 N. Sixteenth.

ALANSON LOLA HALLSTED, B.S., Assistant in Dry Farming, Fort Hays Branch Agricultural Experiment Station (1910).
B. S., 1903. Hays, Kan.

NELLIE MAY, Postmistress (Sept. 1, 1911).
A 44; R. R. 2.

HATTIE HELEN WHITE, Secretary, Business Office (July 24, 1912).
A 27; 717 Laramie.

ASHER EULESTA LANGWORTHY, Ph.C., Feeding-stuffs Inspector, Agricultural Experiment Station (1912).
Ph. C., University of Kansas, 1911. Ag 26; 1709 Laramie.

ROBERT GETTY,[2] B.S.A., Assistant in Forage Crops, Fort Hays Branch Agricultural Experiment Station (1913).
B. S. A., University of Nebraska, 1913. Hays, Kan.

OTIS EVERETT STRODTMAN,[2] D.V.S., Deputy Inspector and College Representative, Marshall County Cholera Eradication Project (1914).
D. V. S., Kansas City Veterinary College, 1911. Marysville, Kan.

HUGH DURHAM, A.M., Assistant to the Dean, Division of Agriculture (1915); Assistant to the Director, Agricultural Experiment Station (1915, 1918).
Graduate, Kansas State Normal School, 1901; A. B., University of Kansas, 1909; A. M., ibid., 1915. Ag 30; 730 Osage.

MABEL GERTRUDE BAXTER, Assistant in Charge of Continuations, College Library (1916, 1918).
F 31; 1624 Fairchild.

LESTER HENRY DRAYER, Assistant in Heat and Power (1916).
E 3; 1735 Laramie.

ELISABETH PERRY HARLING, Seed Analyst (1912, 1917).
Ag 77; 628 Fremont.

HENRY JAMES ALLEN, Assistant in Heat and Power (1914, 1917).
E 27; 330 Vattier.

GEORGE HERBERT PHINNEY,[3] Assistant in Agronomy (1917); Foreman of Agronomy Farm (1917).
Graduate, Topeka Business College, 1903. Agronomy Farm.

MARY KIMBALL, B.S., Assistant to the Registrar (Jan. 1, 1918).
B. S., 1907. A 29; 1311 Laramie.

MYRTLE EVELYN ZENER, Secretary to the Vice President (Apr. 12, 1918).
A 49; 1423 Fairchild.

CHESTER WILLIS OAKES, Miller, Department of Milling Industry (1918).
Ag 26C; 1031 Vattier.

CYRUS EARL BUCHANAN, Assistant in Feed Control (1912, 1918).
Ag 26A; 521 Vattier.

LOUISE SCHWENSEN, Secretary to the Dean, Division of Engineering (1915, 1918).
E 115; 1626 Laramie.

2. In coöperation with the U. S. Department of Agriculture.
3. Absent on leave, July 1, 1921 - April 1, 1922.

CORA ALBERTA PITMAN, B.S., Assistant to the Registrar (1918).
B. S., 1916. A 29; 730 Yuma.

RUTH EVALYN HURD WEST, M.S., Assistant in Zoölogy (1918).
B. S., Carthage College, 1918; M. S., 1921. F 55; 617 N. Manhattan.

BRUCE BUNYAN SMITH, B.S., Assistant in Agricultural Engineering (1918).
Bks. 2; 830 Laramie.

FRANK MARION AIMAN, State Feeding-stuffs Inspector (1919).
Ag 26B; 528 Laramie.

ESTHER FAYMAN, Secretary to the President (1919).
A 30; 1433 Anderson.

ALICE MAUDE MELTON, B.S., Secretary to the Dean, Division of General Science (1900, 1919).
B. S., 1918. A 49; 1637 Osage.

JOHN VICTOR ROLANDER, Assistant in Heat and Power (1919).
E 27; 517 Kearney.

EDWARD L. CLAEREN, Major, U. S. R., Secretary to the Commandant (1910, 1919).
N 27; 900 Pierre.

MARY ELVA CROCKETT, Secretary to the Dean, Division of Home Economics (Sept. 1, 1919).
L 29; 335 N. Fifteenth.

GRACE ELLEN UMBERGER, B.S., R.N., Assistant to the College Physician (1919).
B. S., 1905; R. N., Illinois Training School for Nurses, 1909. A 65; 1110 Vattier.

ALBERT HARRISON KERNS, Assistant to the Superintendent, Fort Hays Branch Agricultural Experiment Station (1919).
Hays, Kan.

JOHN WORLEY TATTERSHALL, Assistant in Heat and Power (1920).
E 26B; 912 Thurston.

FRANK CUMISKEY, First Sergt., U. S. A., Assistant in Physical Training (1920).
N 26; 1015 Pierre.

OTIS JAY GOULD, Sr., Deputy Dairy Commissioner (1920).
X 26; 900 Bluemont.

DELFA MARY HAZELTINE, Secretary to the Dean, Division of College Extension (1920).
Graduate, Lawrence Business College. A 33; 817 Poyntz.

CHARLES OTIS JOHNSTON, B.S., Experimental Assistant in Botany, Agricultural Experiment Station (1920).
B. S., 1918. H 56A; 1323 Laramie.

RUTH COOLEY, B.S., Secretary to Dean of the Summer School (1918, 1920).
B. S., 1906. A 27; Eighteenth and Fairchild.

HENRY RAYMOND BAKER, B.S., Assistant Bacteriologist, Agricultural Experiment Station (1920).
B. S., Massachusetts Agricultural College, 1920. V 52; 321 N. Delaware.

FLORENCE EVANS,[1] B.S., Assistant in Applied Art (1920 - Dec. 21, 1921).
B. S., 1917. A 68; 1220 Laramie.

EVALENE VIRGINIA KRAMER, B.S., Assistant in Household Economics (1920).
B. S., 1919. K 28; 1111 Bluemont.

1. Resigned.

MARY ELIZABETH POLSON, B.S., Assistant in Clothing and Textiles (1920).
B. S., 1916. L 65; 904 Bluemont.

CLARENCE OSBURN PRICE, Assistant to the President (1920).
A 32; 412 Moro.

RALPH DALE NICHOLS, B.S., Research Assistant in Agricultural Economics (1920).
B. S., 1920. McPherson, Kan.

NELLIE ERMA BEHNKE, R.N., Nurse, Department of Student Health (1920).
Graduate Nurse, Lakeside Hospital, Cleveland, Ohio, 1911. A 65; CH.

CAROLINE MAY PERKINS, A.B., Assistant in Genetics (1920).
A. B., New Hampshire College, 1919. Insectary; 1430 Poyntz.

MATTHEW JOSEPH CONNOLLY, Sergt. Inf., U. S. A., Assistant in Military Science and Tactics (Feb. 17, 1921).
N 26; 813 Leavenworth.

DONALD DEWITT WILSON, Nurseryman, Fort Hays Branch Agricultural Experiment Station (Mar. 1, 1921).
Hays, Kan.

MAUD FINLEY, Assistant in Millinery, Division of College Extension (April 1, 1921).
A 36; 917 Osage.

HOMER HENNEY,[2] Research Assistant in Agricultural Economics (Apr. 8, 1921).
B. S., 1921. Cottonwood Falls.

CHESTER ALBERN HERRICK, B.S., Research Assistant in Zoölogy (July 1, 1921).
B. S., 1921. F 59; 1326 Fremont.

LUELLA SCHAUMBURG, B.S., Research Assistant in Poultry Husbandry (July 1, 1921).
B. S., 1920. PF; 918 Moro.

ROY WILSON WAMPLER, M.S., Assistant Chemist, Agricultural Experiment Station (July 1, 1921).
A. B., McPherson College, 1920; M. S., 1921. C 10; 510 Bluemont.

KENNETH MILLER RENNER, B.S., Assistant in Dairy Husbandry (Aug. 1, 1921).
B. S., Iowa State College, 1921. D 30; 826 Osage.

WILLIAM ILLINGWORTH, Master Sergt., U.S.A., Band Leader (Aug. 25, 1921).
N 54; 510 Kearney.

BERTHA LEWIS DANHEIM, B.S., Laboratory Assistant in Zoölogy (Sept. 1, 1921).
B. S., 1920. F 59; 1425 Laramie.

JOHN CLIFFORD JENKINS, B.S., Assistant Chemist, Agricultural Experiment Station (Sept. 1, 1921).
B. S., Pennsylvania State College, 1921. D 3; 1623 Anderson.

JOSEPH FARRINGTON MERRILL, B.S., Assistant Chemist, Agricultural Experiment Station (Sept. 1, 1921).
B. S., University of Maine, 1907. D 3; 318 N. Sixteenth.

MARY EMMA WORRALL, Assistant in Physical Education for Women (Sept. 1, 1921).
Diploma, Sargent School of Physical Education, 1921. N 1; 1412 Leavenworth.

RICHARD PEREGRINE WHITE, B.S., Assistant in Plant Pathology (Sept. 15, 1921).
B. S., Dartmouth College, 1918. H 56; 1809 Leavenworth.

2. In coöperation with the U. S. Department of Agriculture.

JAMES M. WHITAKER, Assistant in Agricultural Engineering (Oct. 1, 1921).
Bks. 3; N. Manhattan Ave.

JAMES HERBERT MOYER, B.S., Assistant in Agricultural Economics (Oct. 1, 1921).
B. S., 1921. Courthouse; Holton, Kan.

CHARLES FREDERICK LARSON,[1] Assistant in Department of Illustrations (Nov. 15, 1921 - Jan. 31, 1922).
I; 831 Bluemont.

JOHN BENJAMIN BENNETT, B.S., Extension Journalist, Division of College Extension (Oct. 15, 1921).
B. S. in Agr., Cornell University, 1921. A 33; 1623 Anderson.

FLOYD JAMES REYNOLDS, Assistant in Blacksmithing (Nov. 7, 1921).
S 62; 337 N. Fourteenth.

SARAH SCHNIERLE ULRICH,[3] Assistant in English (Nov. 28, 1921).
K 27; 1525 Poyntz.

ETHEL MAY ARNOLD, B.S., Assistant in Applied Art (Jan. 1, 1922).
B. S., 1918; Graduate, French-American School of Costume Designing, Los Angeles, Cal., 1921. A 68; College Hill.

ROBERT EARL CLELAND,[3] B.S., Deputy Dairy Commissioner (Jan. 1 - Feb. 28, 1922).
B. S., 1922. X; 616 Poyntz.

JOHN E. RYLAND, A.B., Rehabilitation Assistant, U. S. Veterans Bureau (Jan. 1, 1922).
A. B., University of Missouri, 1910. G; 1222 Bluemont.

FLOYD JOSEPH HANNA, Assistant in Department of Illustrations (Feb. 1, 1922).
I; 310 Leavenworth.

GEORGE HUITT, Dry-land Project Assistant, Fort Hays Branch Agricultural Experiment Station (Feb. 1, 1922).
Hays, Kan.

ROY D. PAQUETTE, Sergt., C. A. C., U. S. A., Assistant in Military Science and Tactics (Feb. 20, 1922).
N 26; 913 Vattier.

SUPERINTENDENTS

LOUIS C. AICHER, B.S., Superintendent, Fort Hays Branch Agricultural Experiment Station (Sept. 26, 1921).
B. S. in Agr., 1910. Hays, Kan.

JACOB LUND, M.S., Superintendent of Heat and Power (1893, 1901); Custodian of Buildings and Grounds (1893, 1917).
B. S., 1883; M. S., 1886. E 26B; 1414 Fairchild.

HAROLD BAYLISS MUGGLESTONE, Superintendent of Poultry Farm (1918).
Poultry Farm.

CHARLES WESLEY HOBBS, D.V.S., Superintendent of Vaccine Laboratories (1913, 1919).
D. V. S., Western Veterinary College, 1901. V 31; 303 N. Sixteenth.

GEORGE RICHARD PAULING, Superintendent of Building and Repair (1916, 1919).
S 34; 1017 Fremont.

1. Resigned.
3. Temporary appointment.

FAY ARTHUR WAGNER, B.S., Superintendent, Garden City Branch Agricultural Experiment Station (1919).
B. S. in Agr., New Mexico Agricultural College, 1916. Garden City, Kan.

G. E. LOWREY, Superintendent, Tribune Branch Agricultural Experiment Station (1920).
Tribune, Kan.

BENJAMIN FRANCIS BARNES, B.S., Superintendent, Colby Branch Agricultural Experiment Station (1921).
Colby, Kan.

AGRICULTURAL AGENTS

WILLIAM ARMFIELD BOYS, B.S., Sumner County Agricultural Agent, Division of College Extension (1912, 1918).
B. S., 1904. Wellington, Kan.

EVEREST JOHN MACY, B.S., Sedgwick County Agricultural Agent, Division of College Extension (1913, 1918).
B. S., Earlham College, 1904. Wichita, Kan.

VALENTINE MEACHAM EMMERT, B.S., McPherson County Agricultural Agent, Division of College Extension (1916).
B. S., 1901. McPherson, Kan.

RAYMOND OLIVER SMITH, B.S., Douglas County Agricultural Agent, Division of College Extension (1916, 1920).
B. S. in Agr., University of Nebraska, 1915. Lawrence, Kan.

RALPH POWELL SCHNACKE, B.S., Pawnee County Agricultural Agent, Division of College Extension (1916).
B. S., 1916. Larned, Kan.

IRA NICHOLS CHAPMAN, B.S., Leavenworth County Agricultural Agent, Division of College Extension (1916).
B. S., 1916. Leavenworth, Kan.

FLOYD JOE ROBBINS, B.S., Franklin County Agricultural Agent, Division of College Extension (1917).
B. S., 1913. Ottawa, Kan.

CHARLES D. THOMPSON, B.S.D., Neosho County Agricultural Agent, Division of College Extension (1918).
B. S. D., Warrensburg (Mo.) State Normal School, 1895. Erie, Kan.

EDWIN ISAAC MARIS,[1] B.S., Rawlins County Agricultural Agent, Division of College Extension (1918 - Feb. 10, 1922).
B. S., 1916. Atwood, Kan.

AVERY CLEVELAND MALONEY, B.S., Bourbon County Agricultural Agent, Division of College Extension (1918).
B. S., 1918. Fort Scott, Kan.

EDWARD H. LEKER, B.S.A., Jackson County Agricultural Agent, Division of College Extension (1918).
B. S. A., University of Missouri, 1917. Holton, Kan.

HERBERT LYNNE HILDWEIN, B.S., Kingman County Agricultural Agent, Division of College Extension (1917, 1918).
B. S., 1914. Kingman, Kan.

HAYS MARION COLE, Montgomery County Agricultural Agent, Division of College Extension (1918).
Independence, Kan.

1. Resigned.

FRANK SUMNER TURNER,[1] B. S., Anderson County Agricultural Agent, Division of College Extension (1918 - Dec. 31, 1921).
B. S., 1917. Garnett, Kan.

JOE MYRON GOODWIN, Jefferson County Agricultural Agent, Division of College Extension (1919).
Valley Falls, Kan.

FRANK OTTO BLECHA, B. S., Shawnee County Agricultural Agent, Division of College Extension (1919).
B. S., 1918. Topeka, Kan.

FRANK HAROLD DILLENBECK, B. S., Doniphan County Agricultural Agent, Division of College Extension (1919).
B. S., 1916. Troy, Kan.

EMMETT L. GARRETT, B. S. A., Comanche County Agricultural Agent, Division of College Extension (1919).
B. S. A., Oklahoma A. and M. College, 1915. Coldwater, Kan.

CHARLES ELMER CASSEL, B. S., Finney County Agricultural Agent, Division of College Extension (1912, 1917).
B. S., 1910. Garden City, Kan.

ALBERT BARNEY KIMBALL, B. S., Harvey County Agricultural Agent, Division of College Extension (1918; June 1, 1920).
B. S., 1889. Newton, Kan.

ROBERT ELLIOTT CURTIS, B. S., Clay County Agricultural Agent, Division of College Extension (1919).
B. S., 1916. Clay Center, Kan.

JAMES HENDRIX MCADAMS,[1] B. S., Coffey County Agricultural Agent, Division of College Extension (1919 - Dec. 31, 1921).
B. S., 1916. Burlington, Kan.

CARL VINCENT MALONEY,[1] B. S., Meade County Agricultural Agent, Division of College Extension (1919 - Dec. 15, 1921).
B. S., 1919. Meade, Kan.

HERMAN FREDERICK TAGGE, B. S., Atchison County Agricultural Agent, Division of College Extension (1920).
B. S., 1914. Effingham, Kan.

WILLIAM HERBERT BROOKS, B. S., Miami County Agricultural Agent, Division of College Extension (1920).
B. S., 1920. Paola, Kan.

JOHN ALBERT HENDRIKS, B. S. A., Chase County Agricultural Agent, Division of College Extension (1920).
B. S., Iowa State College, 1913. Cottonwood Falls, Kan.

ERNEST LEE MCINTOSH, B. S., Nemaha County Agricultural Agent, Division of College Extension (1920).
B. S., 1920. Seneca, Kan.

HARRY CHARLES BAIRD, B. S., Ford County Agricultural Agent, Division of College Extension (1920).
B. S., 1914. Dodge City, Kan.

CLARENCE OWEN GRANDFIELD, B. S., Wilson County Agricultural Agent, Division of College Extension (1920).
B. S., 1917. Fredonia, Kan.

1. Resigned.

CHARLES A. BOYLE,[1] Cloud County Agricultural Agent, Division of College Extension (1920 - Mar. 9, 1922).
Concordia, Kan.

ARTHUR I. GILKISON, Cheyenne County Agricultural Agent, Division of College Extension (1920).
St. Francis, Kan.

CARL CARLSON, A.B., Rawlins County Agricultural Agent, Division of College Extension (1920; Feb. 27, 1922); Rush County Agricultural Agent, Division of College Extension (1920 - Feb. 26, 1922).
A. B., Southwestern College, 1914. Atwood, Kan.

CARL LEWIS HOWARD, B.S., Ellis County Agricultural Agent, Division of College Extension (May 1, 1920).
B. S., 1920. Hays, Kan.

VERNON SIMPSON CRIPPEN, B.S., Pratt County Agricultural Agent, Division of College Extension (June 1, 1920).
B. S., 1920. Pratt, Kan.

FREDERICK JOHN PETERS, B.S., Greenwood County Agricultural Agent, Division of College Extension (June 1, 1920).
B. S., 1920. Eureka, Kan.

KYLE DAVID THOMPSON, B.S., Rooks County Agricultural Agent, Division of College Extension (June 1, 1920).
B. S., 1920. Stockton, Kan.

HARBERD STEPHEN WISE, B.S., Butler County Agricultural Agent, Division of College Extension (1920; May 15, 1921).
B. S., 1920. Lyndon, Kan.

THEODORE FRANKLIN YOST, B.S., Cloud County Agricultural Agent, Division of College Extension (1920; Mar. 12, 1922); Hodgeman County Agricultural Agent, Division of College Extension (1920 - Mar. 11, 1922).
B. S., 1920. Jetmore, Kan.

WARD RAY MILES,[1] B.S., Barton County Agricultural Agent, Division of College Extension (1920 - Mar. 31, 1922).
B. S., 1920. Great Bend, Kan.

JOHN FREDERICK EGGERMAN, B.S., Wichita-Greeley County Agricultural Agent, Division of College Extension (July 1, 1920).
B. S., 1918. Leoti, Kan.

CHARLES ARTHUR PATTERSON, B.S., Wyandotte County Agricultural Agent, Division of College Extension (July 10, 1920).
B. S., 1914. Kansas City, Kan.

SAMUEL JOSEPH SMITH, B.S., Reno County Agricultural Agent, Division of College Extension (Aug. 10, 1920).
B. S., 1920. Hutchinson, Kan.

WALTER WAYNE HOUGHTON, B.S., Jewell County Agricultural Agent, Division of College Extension (Sept. 1, 1920).
B. S., 1918. Mankato, Kan.

ARTHUR LEROY MYERS, B.S., Marion County Agricultural Agent, Division of College Extension (Sept. 1, 1920).
B. S., 1920. Marion, Kan.

RAYMOND FRANKLIN OLINGER, B.S., Labette County Agricultural Agent, Division of College Extension (Sept. 6, 1920).
B. S., 1913. Altamont, Kan.

1. Resigned.

JAMES ARTHUR MILHAM, B.S., Allen County Agricultural Agent, Division of College Extension (Oct. 11, 1920).
B. S., 1907. Iola, Kan.

CECIL LYMAN MCFADDEN, B.S., Lyon County Agricultural Agent, Division of College Extension (Nov. 20, 1920).
B. S., 1918. Emporia, Kan.

JOHN MONROE DODRILL,[1] Ness County Agricultural Agent, Division of College Extension (Jan. 1, 1921 - Dec. 31, 1921).
Ness City, Kan.

ROY ELMER GWIN, B.S., Cherokee County Agricultural Agent, Division of College Extension (Jan. 1, 1921).
B. S., 1914. Columbus, Kan.

JOHN VERN HEPLER, B.S., Washington County Agricultural Agent, Division of College Extension (Jan. 3, 1921).
B. S., 1916. Washington, Kan.

PAUL BERNARD GWIN, B.S., Morris County Agricultural Agent, Division of College Extension (Feb. 1, 1921).
B. S., 1916. Council Grove, Kan.

CHESTER EUGENE GRAVES, B.S., Johnson County Agricultural Agent, Division of College Extension (Feb. 9, 1921).
B. S., 1920. Olathe, Kan.

CLELL ANSELL NEWELL, B.S., Lincoln County Agricultural Agent, Division of College Extension (Feb. 16, 1921; Apr. 15, 1921).
B. S., 1920. Lincoln, Kan.

WALTER BROWN ADAIR, B.S., Rice County Agricultural Agent, Division of College Extension (Mar. 1, 1921).
B. S., 1916. Lyons, Kan.

WILLIAM LOUIS TAYLOE, B.S.A., Crawford County Agricultural Agent, Division of College Extension (Apr. 4, 1921).
B. S. A., University of Missouri, 1917. Council Grove, Kan.

LOUIS HENRY ROCKFORD, B.S., Osage County Agricultural Agent, Division of College Extension (May 16, 1921).
B. S., 1919. Lyndon, Kan.

JOHN JERRY INSKEEP, B.S., Marshall County Agricultural Agent, Division of College Extension (June 10, 1921).
B. S., Purdue University, 1921. Blue Rapids, Kan.

ROLLA WADE MCCALL, B.S., Clark County Agricultural Agent, Division of College Extension (June 6, 1921).
B. S., 1921. Ashland, Kan.

CHARLES HAROLD STINSON, B.S., Gray County Agricultural Agent, Division of College Extension (June 11, 1921).
B. S., 1921. Cimarron, Kan.

CLARENCE SMITH MERYDITH, B.S., Meade County Agricultural Agent, Division of College Extension (Dec. 15, 1921).
B. S., Oklahoma A. and M. College, 1912. Meade, Kan.

CLARENCE ROY JACCARD, B.S., Coffey County Agricultural Agent, Division of College Extension (Jan. 1, 1922).
B. S., 1914. Burlington, Kan.

1. Resigned.

LEO DEWEY PTACEK, B.S., Ness County Agricultural Agent, Division of College Extension (Jan. 1, 1922).
B. S., 1920. Ness City, Kan.

ABIJAH WILCOX FOSTER, B.S., Anderson County Agricultural Agent, Division of College Extension (Jan. 20, 1922).
B. S., 1920. Garnett, Kan.

ROSS JACOB SILKETT, B.S., Rush County Agricultural Agent, Division of College Extension (Feb. 22, 1922).
B. S., 1922. La Crosse, Kan.

DUKE DANIEL BROWN, B.S., Hodgeman County Agricultural Agent, Division of College Extension (Mar. 25, 1922).
B. S., 1922. Jetmore, Kan.

ROBERT E. WILLIAMS, B.S., Barton County Agricultural Agent, Division of College Extension (April 1, 1922).
B. S., 1907. Great Bend, Kan.

HOME DEMONSTRATION AGENTS[2]

ETHEL L. BREINER, Anderson County Home Demonstration Agent, Division of College Extension (1920).
Garnett, Kan.

SARA JANE PATTON, B.S., Cherokee County Home Demonstration Agent, Division of College Extension (1918, 1919).
B. S., 1915. Columbus, Kan.

ETHEL MCDONALD, B.S., Sedgwick County Home Demonstration Agent, Division of College Extension (1919; May 1, 1922); Meade County Home Demonstration Agent, Division of College Extension (1919 - May 1, 1922).
B. S., 1907. Wichita, Kan.

JULIA WALCOTT KIENE, Shawnee County Home Demonstration Agent, Division of College Extension (1920).
Graduate, Stout Institute. Topeka, Kan.

FERN VIVIAN JESSUP,[1] B.S., Nemaha County Home Demonstration Agent, Division of College Extension (1920 - Dec. 15, 1921).
B. S., 1911. Seneca, Kan.

MOLLIE LINDSEY, Washington County Home Demonstration Agent, Division of College Extension (1918, 1919).
Washington, Kan.

MAUDE MILDRED COE, B.S., Wyandotte County Home Demonstration Agent, Division of College Extension (Feb. 1, 1922).
Kansas City, Kan.

EDITH ANTONETTE HOLMBERG, B.S., Pratt County Home Demonstration Agent, Division of College Extension (Apr. 1, 1922).
B. S., 1908. Pratt, Kan.

COUNTY LEADERS IN BOYS' AND GIRLS' CLUB WORK

JESSIE STEVENS MCCAFFERTY,[1] Jefferson County Club Leader, Division of College Extension (1918, 1919 - Dec. 31, 1921).
Oskaloosa, Kan.

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1. Resigned.
2. In coöperation with the U. S. Department of Agriculture.

FLORENCE WHIPPLE,[1] B.S., Leavenworth County Club Leader, Division of College Extension (1919 - Jan. 31, 1921).
B. S., 1912. Leavenworth, Kan.

ELEANOR HOWE, B.S., Leavenworth County Club Leader, Division of College Extension (Mar. 6, 1922).
B. S., University of Illinois, 1922. Leavenworth, Kan.

HAZEL PRICE SCALAPINO, Brown County Club Leader, Division of College Extension (Mar. 1, 1922).
Fairview, Kan.

GRADUATE ASSISTANTS

WALTER RAWLINS HORLACHER, B.S., Graduate Assistant in Animal Husbandry (1920).
B. S., 1920. Ag 13A; 1642 Fairchild.

ELIZABETH EMILY KIRKPATRICK, B.S., Graduate Assistant in Food Economics and Nutrition (1920).
B. S., 1920. L 53; 1641 Fairchild.

MILDRED KAUCHER, B.S., Graduate Assistant in Household Economics (Sept. 1, 1921).
B. S., 1921. L 53; 819 Leavenworth.

WILLIAM VINCENT LAMBERT, B.S. A., Graduate Assistant in Animal Husbandry (Sept. 1, 1921).
B. S. A., University of Nebraska, 1921. Ag 15A; 1419 Humboldt.

EVERETT TUNNICLIFF, D.V.M., Graduate Assistant in Bacteriology (Sept. 1, 1921).
D. V. M., 1921. V 53B; 1412 Laramie.

RUTH EVELYN WILLIS,[3] B.S., Graduate Assistant in History and Civics (Nov. 15, 1921).
B. S., 1921. G 51; 711 Fremont.

OTHER OFFICERS

JESSIE MCDOWELL MACHIR, College Registrar (1913).
A 29; 1641 Fairchild.

CLIFTON JAIRUS STRATTON, B.S., in Charge of Alumni and Student Relationships (1920).
B. S., 1911. I; 1010 Humboldt.

ADRIAN AUGUSTUS HOLTZ, Ph.D., Men's Adviser and Secretary of Young Men's Christian Association (1919).
A. B., Colgate University, 1909; Ph. M., University of Chicago, 1910; B. D., ibid., 1911; Ph. D., ibid., 1914. A; 611 Kearney.

IRENE MAY DEAN, A.B., General Secretary, Young Women's Christian Association (1919).
A. B., Washburn College, 1914. L 39; 1641 Fairchild.

HOWARD RODNEY JOSLIN, Coördinator, U. S. Veteran's Bureau (Feb. 14, 1922).
G 27; 914 Osage.

STEPHEN ARNOLD GEAUQUE, Assistant Custodian (1918, 1919).
G 33; 414 N. Ninth.

1. Resigned.
3. Temporary appointment.

Standing Committees of the Faculty

ADMISSION: Jessie McD. Machir, J. V. Cortelyou, B. L. Remick, Ina Holroyd, J. O. Hamilton, W. H. Andrews, G. A. Dean, H. L. Ibsen, J. H. Robert.

ADVANCED CREDIT: *College.*—R. R. Price, L. E. Call, H. H. King, J. T. Willard, H. W. Davis, R. R. Dykstra, Martha Pittman.

School of Agriculture.—A. P. Davidson, E. V. James, W. T. Stratton, Wilma Orem.

ASSIGNMENT: Jessie McD. Machir, L. A. Fitz, A. E. White, Araminta Holman, C. V. Williams, C. H. Scholer.

ATHLETICS: Wm. M. Jardine, H. H. King, M. F. Ahearn, G. A. Dean, E. L. Holton, R. A. Seaton, R. I. Throckmorton, W. E. Muldoon, C. J. Stratton.

CATALOGUE: J. V. Cortelyou, J. T. Willard, H. W. Davis.

COUNCIL ON STUDENT AFFAIRS: Mary P. Van Zile, F. B. Terrell, P. P. Brainard, H. W. Davis, Albert Dickens, A. P. Davidson, A. A. Holtz, Irene M. Dean, Louise Tausche, M. F. Ahearn, Grace E. Derby, H. T. Hill, H. H. King, Grace R. Hesse, Eric Englund.

DEBATE: J. E. Kammeyer, H. E. Rosson, J. G. Emerson.

FACULTY LOAN FUND: J. V. Cortelyou, Mary P. Van Zile, Helen B. Thompson, R. R. Dykstra, L. E. Call, R. A. Seaton, Jessie McD. Machir.

GRADUATE STUDY: W. A. Lippincott, L. E. Conrad, L. E. Call, Helen B. Thompson, H. H. King, R. K. Nabours, J. H. Burt.

PUBLIC EXERCISES: J. E. Kammeyer, J. V. Cortelyou, Ira Pratt, H. W. Davis, E. L. Holton, W. H. Andrews, W. A. Lippincott.

SCHEDULE OF CLASSES: A. E. White, J. T. Willard, W. T. Stratton, R. I. Throckmorton, L. E. Conrad, Hildegarde Kneeland.

STUDENT DIRECTORY: Jessie McD. Machir, E. T. Keith, J. T. Willard.

STUDENT HEALTH: L. E. Conrad, L. D. Bushnell, Mary P. Van Zile, C. M. Siever, M. F. Ahearn.

STUDENT HONORS: J. O. Hamilton, C. E. Reid, R. W. Conover.

VOCATIONAL GUIDANCE: F. D. Farrell, Mary P. Van Zile, Helen B. Thompson, J. T. Willard, R. A. Seaton, R. R. Dykstra, E. L. Holton.

Agricultural Experiment Station

OFFICERS OF THE STATION

W. M. JARDINE, President of the College.

ADMINISTRATION—
F. D. FARRELL, Director.
JAMES A. KIMBALL, Business Manager.
HUGH DURHAM, Assistant to Director.

AGRICULTURAL ECONOMICS—
W. E. GRIMES, Farm Organization, in Charge.
ERIC ENGLUND, Land Economics.
R. M. GREEN, Marketing.
J. H. MOYER, Cost of Production.
H. J. HENNEY, Cost of Production.
R. D. NICHOLS, Cost of Production.
MORRIS EVANS, Farm Organization.

AGRONOMY—
L. E. CALL, in Charge.
S. C. SALMON, Crops.
R. I. THROCKMORTON, Soils.
J. H. PARKER, Plant Breeding.
M. C. SEWELL, Soils.
R. L. HENSEL, Pasture Investigations.
J. W. ZAHNLEY, Crops.
H. H. LAUDE, Coöperative Experiments.
N. E. DALE, Coöperative Experiments.
G. H. PHINNEY, Farm Foreman.
ELISABETH HARLING, Seed Analyst.

ANIMAL HUSBANDRY—
C. W. MCCAMPBELL, Cattle, in Charge.
H. L. IBSEN, Animal Breeding.
F. W. BELL, Swine Investigations.
B. M. ANDERSON, Horse Investigations.
A. M. PATERSON, Sheep Investigations.
H. B. WINCHESTER, Feeding Investigations.

BACTERIOLOGY—
L. D. BUSHNELL, in Charge.
A. C. FAY, Dairy Bacteriology.
P. L. GAINEY, Soil Bacteriology.
F. R. BEAUDETTE, Poultry Disease Investigations.

BOTANY—
L. E. MELCHERS, Plant Pathology, in Charge.
E. C. MILLER, Plant Physiology.

CHEMISTRY—

H. H. KING, in Charge.
J. T. WILLARD, Consulting Chemist.
C. O. SWANSON, Soils and Crops.
W. L. LATSHAW, in Charge Analytical Laboratory.
E. L. TAGUE, Protein Investigations.
J. S. HUGHES, Animal Nutrition.
R. N. LOOMIS, Feedingstuffs Analysis.
J. C. JENKINS, Animal Nutrition.
J. F. MERRILL, Fertilizer Analysis.

DAIRY HUSBANDRY—

J. B. FITCH, in Charge.
H. W. CAVE, Dairy Production.
N. E. OLSON, Dairy Manufactures.
R. B. BECKER, in Charge Official Tests.
H. M. JONES, State Dairy Commissioner.

ENTOMOLOGY—

G. A. DEAN, in Charge.
J. H. MERRILL, Apiculture, Fruit Insects.
J. W. MCCOLLOCH, Staple Crop Insect Investigations.
W. P. HAYES, Staple Crop Insect Investigations.
ROGER C. SMITH, Staple Crop Insect Investigations.

HORTICULTURE—

ALBERT DICKENS, in Charge.
R. J. BARNETT, Pomology.
W. F. PICKETT, Orchard Investigations.

MILLING INDUSTRY—

L. A. FITZ, in Charge.
P. L. MANN, Wheat and Flour Investigations.
C. W. OAKES, Miller.
A. E. LANGWORTHY, Feed Control.
F. M. AIMAN, Feed Control.
C. E. BUCHANAN, Feed Control.

POULTRY HUSBANDRY—

W. A. LIPPINCOTT, in Charge.
L. F. PAYNE, Incubation.
H. B. MUGGLESTONE, Superintendent of Poultry Plant.

VETERINARY MEDICINE—

R. R. DYKSTRA, in Charge.
C. W. HOBBS, Field Veterinarian.
H. F. LIENHARDT, Pathology.
J. P. SCOTT, Blackleg Investigations.
N. D. HARWOOD, Vaccine Production.
C. A. KITSELMAN, Abortion Disease Investigations.

ZOOLOGY—

R. K. NABOURS, in Charge.
J. E. ACKERT, Parasitology.
CAROLINE PERKINS, Genetics.
F. L. HISAW, Injurious Mammals.

BRANCH EXPERIMENT STATIONS

FORT HAYS—

L. C. AICHER, Superintendent.
A. L. HALLSTED, Dry-farming Investigations.[1]
R. E. GETTY, Forage Crop Investigations.[1]
A. F. SWANSON, Cereal Crops.[1]
D. D. WILSON, Forest Nurseryman.

GARDEN CITY—

F. A. WAGNER, Superintendent.
———, Dry-land Agriculture Investigations.[1]

COLBY—

B. F. BARNES, Superintendent.[1]

TRIBUNE—

G. E. LOWREY, Superintendent.

1. In coöperation with the U. S. Department of Agriculture.

Bureau of Research in Home Economics

OFFICERS OF THE BUREAU

W. M. JARDINE, President of the College.
HELEN B. THOMPSON, Director.

L. JEAN BOGERT, Food Economics and Nutrition.
EFFIE M. CARP, Institutional Administration.
LOUISE P. GLANTON, Clothing and Textiles.
HILDEGARDE KNEELAND, Household Administration.
AMY-JANE LEAZENBY, Child Welfare.
MARTHA S. PITTMAN, Food Economics.
HELEN B. THOMPSON, Nutrition and Dietetics.

Engineering Experiment Station

OFFICERS OF THE STATION

W. M. JARDINE, President of the College.

ADMINISTRATION—
R. A. SEATON, Director.
LOUISE SCHWENSON, Secretary.

APPLIED MECHANICS AND MACHINE DESIGN—
R. A. SEATON, in Charge.
C. E. PEARCE, Machine Design.
C. H. SCHOLER, Materials of Construction.
J. H. ROBERT, General Investigations.
E. R. DAWLEY, Materials of Construction.
A. D. CONROW, Road Materials.

AGRICULTURAL ENGINEERING—
H. B. WALKER, in Charge.
W. H. SANDERS, Tractors.
R. H. DRIFTMIER, Farm Machinery.

ARCHITECTURE—
C. F. BAKER, in Charge.
J. D. WALTERS, General Investigations.
PAUL WEIGEL, General Investigations.
———, Rural Architecture.

CHEMISTRY—
H. H. KING, in Charge.
E. B. KEITH, General Investigations.

CIVIL ENGINEERING—
L. E. CONRAD, in Charge.
F. F. FRAZIER, General Investigations.
M. W. FURR, Highway Engineering.

ELECTRICAL ENGINEERING—
C. E. REID, in Charge.
R. G. KLOEFFLER, General Investigations.
J. L. BRENNEMAN, General Investigations.
D. M. PALMER, Assistant.

MECHANICAL ENGINEERING—
J. P. CALDERWOOD, in Charge.
A. J. MACK, General Investigations.
C. J. BRADLEY, Assistant.

PHYSICS—
J. O. HAMILTON, in Charge.
G. E. RABURN, General Investigations.

SHOP PRACTICE—
W. W. CARLSON, in Charge.
G. A. SELLERS, General Investigations.
E. C. JONES, Machine Tools.
D. E. LYNCH, Forging Practice.

Degrees and Certificates Conferred

In the Year 1921

FIRST DIVISION, JUNE 2

DEGREES CONFERRED

HONORARY DEGREES

DOCTOR OF SCIENCE

Charles Lester Marlatt, B. S., Kansas State Agricultural College, 1884, and M. S., Kansas State Agricultural College, 1887.

GRADUATE COURSES

MASTER OF SCIENCE

Esther Bruner, B. S., Kansas State Agricultural College, 1920
Henry White Marston, B. S., Delaware State College, 1919
Nellie Maria Payne, B. S., Kansas State Agricultural College, 1920
Matthew George Stahl, B. S., University of South Africa, 1920
Roy Wilson Wampler, A. B., McPherson College, 1920
Ruth Hurd West, B. S., Carthage College, 1919

AGRICULTURAL ENGINEER

John Dwight Parsons, B. S., Kansas State Agricultural College, 1915

CIVIL ENGINEER

Melvin Ernest Hartzler, B. S., Kansas State Agricultural College, 1914
Harry William Tyrrell, B. S., Kansas State Agricultural College, 1917

MECHANICAL ENGINEER

Antis Monteville Butcher, B. S., Kansas State Agricultural College, 1916
Albert John Mack, B. S., Kansas State Agricultural College, 1912
Ivor Orin Mall, B. S., Kansas State Agricultural College, 1918

UNDERGRADUATE CURRICULA

Division of Agriculture

BACHELOR OF SCIENCE IN AGRICULTURE

George Clarence Anderson
Ray Allen Axtell
Herbert Conner Barrett
Thomas Baumgartner
Fred William Boyd
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John Farr Brown
Samuel David Capper
Sylvan Harold Coffman
Arthur Everett Cook
Robert Francis Copple
Everett Russell Cowell
Charles Deforest Davis
Dorsie Lawrence Deniston
George Milton Drumm
Linn Edmund Eberwein
John Francis Ellis
Ray Ferree
Henry Gilbert Gentry
Chester Eugene Graves
Clinton DeWitt Guy
Homer Jay Henney
Ethan Allen Herr
George Randolph Hewey
Dalton Ray Hooton
John Albert Howarth
George Scott Jennings
George Lowell Kelley
Foley Kyih Kiang
Ernest Lester Lahr
Ira Kaull Landon
Clay Forrest Laude
Robert Henry Lush
Eugene Sidney Lyons
Rolla Wade McCall
Elmer David McCollum
Paul Christoph Mangelsdorf
Hilery Edwin Mather

James Herbert Moyer
Clell Ansel Newell
Harry Emory Newton
Charles Nitcher
Oscar Marion Norby
Merton Louis Otto
Orin Ross Peterson
Laurens Hawn Reyburn
William Robertson Schell
David Loyd Signor
Nathaniel Sheridan Spangler
Harold Marshall Spiker
Charles Harold Stinson
Wright Edmund Turner
Louis Vinke
Ray Bates Watson
Willard Welsh
Raymond Francis White
Edwin William Winkler
Phillip Young

Division of Veterinary Medicine

DOCTOR OF VETERINARY MEDICINE

Edgar Hugh Barger
Louis Bloyce Bate
Joseph Alvin Bogue
Homer Conley Boyd
Rex Dean Bushong
Benjamin Finley Clapham
Fred Emerson
John Fredenburg
Clifford Gallagher
Isaac Frank Gatz
Howard Lewis Gingery
Hilborn Hall Groat
Stuart Laverne Hunt
William Lewis Ikard
Jerry Dillard Jarmon
Fintan Oliver Killian
Thomas Gilbert Perry
Chauncey Elias Sawyer
Lee Ashton Scott
Everett Alonzo Tunnicliff
Ray James Weinheimer
Jennings Elliott Williams
Marion Manning Williams

Division of Engineering

BACHELOR OF SCIENCE IN AGRICULTURAL ENGINEERING

Dan Leo Jantz
Samuel Patterson Lyle

BACHELOR OF SCIENCE IN ARCHITECTURE

Ernest Eugene Gilbert
Oliver David Howells
Carl Franklin Mershon

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

Cecil Lloyd Bower
Walter Ellwood Dickerson
Edwin Sill Elcock
Guy Morrell Shelley
Harry Kenneth Shideler
Paul Louis Sites

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Lowell Edwin Baldwin
Ernest Leo Bebb
Roy Shipman Breese
Myers Duphorne
George Wilbèr Fisher
Oscar Deane Gardner
Fred Lynn Hall
Russell Dean Hilliard
Hope Forrester Jenkins
Clifford Frederick Joss
Merle James Lucas
Clarence Hewitt McCandless
Walter Carl Marrs
Charles Francis Morris
John Kent Pike
Flavel Theodore Scriven
Morton Stigers
Thomas Granville Storey
Paul Benjamin Winchel
Clarence LeRoy Zimmerman
Lloyd David Zimmerman

BACHELOR OF SCIENCE IN FLOUR MILL ENGINEERING

Torby Glenn Fletcher

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Guy Mahlon Brown
Russell Vernon Knapp
Franz Joseph Maas
Donald Joseph Mosshart
William Dennis Scully
Floyd Wayne Work

Division of Home Economics

BACHELOR OF SCIENCE IN HOME ECONOMICS

Gladys Virginia Addy
Cora Barbara Akers
Esther Etta Andrews
Ardis Corinne Atkins
Charlotte Hosier Ayers
Elsa Ann Brown
Ida Pearl Carr
Bessie Olive Cole
Gertrude Vivian Conroy
Christine Carol Cool
Nora Bee Corbet
Marceline Willard Couture
Abbie Clair Dennen
Vinnie Drake
Bly Ewalt
Elsie Gladys Flippo
Conie Caroline Foote
Gladys Evelyn Ford
Mary Helen Gilbert
Ruth Harriet Gilles

Mable Celesta Ginter
Irene Florence Graham
Hannah Elizabeth Greenlee
Lucile Clara Hartmann
Margaret Effie Hendricks
Nellie Maria Hord
Hazel Dell Howe
Erma Leota Johnson
Madge Elizabeth Kasten
Mildred Kaucher
Grace Lyness
Florence Ethel Mather
Helen Amy Mitchell
Luella Lucille Morris
Dorothy Moseley
Elsie Marshall Munsell
Marianne Muse
Alice Helen Mustard
Helen Isabel Neiman
Gerda Pauline Olson
Edlena O'Neil
Faye Marie Powell
Doris Hawthorne Prickett
Velva Rader
Ruth Myrtle Ridley
Kathryn Roderick
Gladys De Ella Ross
Marion Elizabeth Sanders
Ursula Susie Senn
Christene Stebbins
Elma Ruth Stewart
Mabel Manghild Swanson
Sara Esther Weide
Frances Josephine Whitmire
Ruth Evelyn Willis
Cora Winget
Elizabeth McNew Winter
Elsie Wolfenbarger
Esther Wright

Division of General Science

BACHELOR OF SCIENCE

Gladys Elizabeth Bushong
Walter Bryan Carey
Zattie Carp
Marian Cecile Clarke
Arthur Bright Collom
Mary Natalie Cruzen
Marguerite Frances Hammerly
Ethel Porter Hatfield
Lester Hoffman Hoffman
Opal Maye Horr
Clifford Clark Kniseley
William Harry Knostman
Ross McCausland
Herbert William McClelland
Anna Belle Neal
Ruby Elizabeth Orth
Harla Phillips
Marion Capps Reed
Myra Edna Scott
Marcia Ann Seeber
Corinne Bertha Thiele
Grace Leota Turner
Ardeth Norine Weddle
Edith Marie Wheatley
Lee Winter

BACHELOR OF SCIENCE IN INDUSTRIAL JOURNALISM

Blanche Lea
Ione Elizabeth Leith
Geta Lund
Mollie Morton
Clementine Haskin Paddleford
Margaret Woodman

BACHELOR OF SCIENCE IN AGRICULTURAL CHEMISTRY

Carl Marcus Conrad

BACHELOR OF SCIENCE IN BIOCHEMISTRY

Lydia Eugenia Rogers

BACHELOR OF MUSIC

Helen Martin Colburn
Flora Pearl Hoots
China Ethel Rogers

COMMISSIONS AWARDED

SECOND LIEUTENANT OF INFANTRY, OFFICERS' RESERVE CORPS

Samuel David Capper
Ray Ferree
Russell Dean Hilliard
Franz Joseph Maas
James Herbert Moyer
*Laurens Hawn Reyburn

SECOND LIEUTENANT, VETERINARY OFFICERS' RESERVE CORPS

Louis Bloyce Bate
Homer Conley Boyd
Fred Emerson
Howard Lewis Gingery
William Lewis Ikard

CERTIFICATES CONFERRED

CERTIFICATE IN FARMERS' SHORT COURSE

Ernest Alwyn Bird
Rice Davies
James D. Dresser
George W. Duncan
Frederick Oswald Imhoff
Ralph H. Leonard
Rodney H. McCollum
Herbert Roepke
John Thomas Sherman
Harry Shoebrook
William von Waaden
George Binzeler
Fred J. Walters

CERTIFICATE IN COMMERCIAL CREAMERY SHORT COURSE

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Charles William Hunter
John S. Jones
Thomas R. O'Meara
Jesse Stanley Putman
H. Glenn Sayers

CERTIFICATE IN AUTO MECHANICS' SHORT COURSE

Theodore August Albright
Paul James Allen
Ralph A. Allen
Archie Clinton Ashpole
Lawrence Becker
Theodore A. Boyer
Joe Dudley Brickell
Raphael Paul Cigna
Alfred Ernest Coffin
James Robb Connery
Ray William Coup
Harry Dreyer
Harvey Dreyer
Clyde Garfield Fee
James Eugene Foote
Earl Edwin Gamber
Vernon C. George
Herbert Christian Heinzman
William Urwin Hinshaw
Paul Weisner Keith
Chester Klinkenberg
Clifford Lake
Evan Shields Lewelling
Owen Winslow Lewis
Guy Hiskett Lynch
Clark Eugene Miller
Frank Raymond Moffat
Ray E. Nichols
John Sherman Posten
Oscar Richter
Clarence Eliot Salisbury
Edwin M. Sours
Leonard Curtis Straight
Theis Erwin Streiff
Milton Monroe Thurow
Ralph Victor Thurow
Edward Russell Tingley
William Henry Vaupel
George M. Walz
Daniel L. Winans

CERTIFICATE IN ELECTRICIANS' SHORT COURSE

Robert Wellington Campbell
Robert Ivan Davis
Herbert Albert Goering
Roscoe Easter Hey
Marion George Hiatt
Ezra Edwin Naffziger
Edwin C. Olson
Carl Ernest Richardson
Everett M. Wilson

CERTIFICATE IN MACHINISTS' SHORT COURSE

William Sewell Watts

CERTIFICATE IN TRACTOR OPERATORS' SHORT COURSE

Buford Benjamin Angle
Frederick Roe Arnold
William E. Aronhalt
William S. Austin
Cecil Louis Batchelder
Glen Alfred Beach
Carroll Wellington Bellomy
Adolph Louis Betz
James Forrest Bird
Francis James Black
Everett Bretches
Llewellyn Herbert Brooks
Walter Scott Bryant
William E. Carmichael
Doyle Henry Carter
Melvin Cohoe
Harry Irl Conzelman
Carroll Earl Currie
Carl Curtis
Fred Earl Dakin
Alvaro Chaves des Essarts
Bennie Henry Diehl
Eslie Harry Dodson
Arthur Dreany
Roy Oren Dundon
Henry Reed Edmonds
Orin Eugene Ellis
Ross Smith Emmons
Charles Esslinger
Peter Esslinger
Thomas James Fowler
Charles Lincoln Foxworthy
August Glahn
Walter Peter Gurtler
Leamon Isaac Hamilton
Guy Edward Harlow
Otis James Heberly
Claude Franklin Hedges
Everett Heiker
William Urwin Hinshaw
Arthur McKinley Hylton
William Johnson
Albert Frank Kast
Albert Keehn
Erwin Stockton Keim
Henry Gottlieb Kohrs
Samuel Larman Ludlum
Lyle Milton Lukens
Minno Smith McKenney
Lloyd Cecil Mann
Frank Lawrence Melville
Orville Eugene Middleton
Lawrence Leonard Milner
Charles Jacob Newman
Henry John Oltjen
Roy L. Pearson
Perly Raymond Pederson
Harry Albert Peterson
John Petracek
Earl Eugene Phares
Floyd Eugene Potts
Paul Swart Quick
Loy Shelley Quimby
Frank Raaf
Vernus Esko Ray
Laurence Rhoads
Francis Flavian Reiger
Rolland Lewis Rudolph
Joseph Rundus
Francis Herbert Russell
Emil Fred Schwarz
Claude Wesley Scovel
James M. Shiveley
Charles Lloyd Stauffer
Theis Streiff
Curtis Trueman Stout
Ernest Lewis Suddarth
Roy Carl Swanson

Floyd Henry Swanson
Harry Tammen
Arthur Teeters
Milton Monroe Thurow
Ralph Victor Thurow
Earl Henry Treaster
Royal Newton Umphres
Ralph Edward Upham
Philip Van Meter
Carl Otto Watson
George Raymond Weller
Newell Ralph Wells
Cecil Ray Whiteley
Floyd Elmer Whiteley
Earl Ray Williams
Ray Glenn Withington
Leonard Aaron Workman

CERTIFICATE IN HOUSEKEEPERS' SHORT COURSE

Nora A. Borror
Harriett Cowles
Lottie R. Dooley
Pearl L. Dooley
Elsie B. Fatzer
Mary J. Fryar
Cora Fulton
Frances M. Guilbert
Alberta E. Harris
Blenda Hedberg
Anita Kazmaier
Helen B. McDonald
Bernice McKee
Stella G. Nash
Hallie Pearson
Wilma Schoen
Vesper Thomas

CERTIFICATE IN PUBLIC-SCHOOL MUSIC

Adalia Capsey Backman
Thelma Marie Dobson
Margaret Ann Hawbaker
Bernice Elma Hedge
Elsie Vera Johnson
Ruth Esther Lambertson
Millicent Ailene Lemons
Florence Imogene Meyer
Olivette Mitsch
Ruth Lucille Owens
Viola Marguerite Simpson
Mary Goldie Watts

SECOND DIVISION

DEGREES CONFERRED

GRADUATE COURSES

MASTER OF SCIENCE

Mary Louise Meuser,* B. S., Kansas State Normal School, 1917

UNDERGRADUATE CURRICULA

Division of Agriculture

BACHELOR OF SCIENCE IN AGRICULTURE.

Raiffe Cobb Alvord*
Philip Asa Barnes*
Claude Brownley Cross*
Fred Hollister Dodge*
William Hopper Getty†
Samuel James Gilbert*
Chester Albern Herrick*
George Winfred Hinds*
Dewey Zollie McCormick*
Ralph Reuben McFadden*
Albert Metz†
Reeves Ayers Osborne*
Karl Spangler Quisenberry*
Warren Roy Stewart*
Allan Park Davidson*

Division of Veterinary Medicine

DOCTOR OF VETERINARY MEDICINE

Chester Anderson King†
Benjamin Franklin Pfister*

Division of Engineering

BACHELOR OF SCIENCE IN AGRICULTURAL ENGINEERING

Abraham Burton Schmidt†

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

Arthur Hayes Brewer*

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Raymond Scott Knox*

Division of Home Economics

BACHELOR OF SCIENCE IN HOME ECONOMICS

Ida May Bare*
Florence Gertrude Jewell*
Harriette Louise Klaver*
Ellen LaVerne Pennel*
Gladys Irene Ritts*
Lillian Colene Stewart*
Lois Wood*
Susan Elizabeth Young*

Division of General Science

BACHELOR OF SCIENCE

Paul Willis Barber*
Ercile Laveta Clark*
Jessie Belle Evans*

BACHELOR OF SCIENCE IN INDUSTRIAL JOURNALISM

Ruby Lee Crocker†
Walter August Karlowski*

CERTIFICATES CONFERRED

Certificate in Public-school Music

Neva Neola Barrows*
Ivy Hildreth Case*
Ella Mae Paustian*
Laura Faye Russell*

* August 2, 1921.

† September 1, 1921.

HONORS

PHI KAPPA PHI

(Class of 1921)

Division of Agriculture

Raiffe Cobb Alvord
Claude Brownley Cross
Charles Deforest Davis
Chester Albern Herrick
Ira Kaull Landon
Clinton Hawthorn Morgan
Merton Louis Otto
Karl Spangler Quisenberry
Lawrence Reyburn
David Loyd Signor
Wright Edmund Turner
Louis Vinke

Division of Engineering

Edwin Elcock
Clarence Hewitt McCandless
Morton Stigers

Division of General Science

Zattie Otellia Carp
Carl Marcus Conrad
William Harry Knostman
Mollie Morton
Anna Belle Neal Muller
Clementine Paddleford
Myra Edna Scott
Norine Ardeth Weddle

Division of Home Economics

Margaret Effie Hendricks
Nellie Maria Hord
Mildred Kaucher
Helen Isabel Neiman
Lillian Colene Stewart
Lois Wood

SENIOR HONORS

(1921)

Division of Agriculture

Charles DeForest Davis
Ira Kaull Landon
Merton Louis Otto
David Loyd Signor

Division of Engineering

Edwin S. Elcock
Clarence Hewitt McCandless

Division of General Science

William Harry Knostman
Clementine Paddleford

Division of Home Economics

Margaret Effie Hendricks
Nellie Maria Hord
Helen Isabel Neiman

JUNIOR HONORS

(1921)

Division of Agriculture

Truman Olvard Garinger
Ezra Perle Mauk

Division of Veterinary Medicine

David Everett Davis

Division of Engineering

Marion Henry Banks
Joseph Ersal Beyer
Harry Hubert Connell
Gerald Lynn Garloch
Harold Irwin Tarpley

Division of General Science

Maude Ella Lahr
Orpha Maust
Ruth Jane Peck

Division of Home Economics

Marian Elizabeth Brookover
Luella Pearl Sherman
Esther Waugh

List of Students

Graduate Students

Graduate Students Working Toward Master's Degree

*Walter Buswell Balch, B. S. 1919 (Cornell University), *Agriculture*
Lansdowne, Pa.

*Ada Grace Billings, B. S. 1916 (Kansas State Agricultural College), *History and Civics*
Manhattan

*Thomas Arthur Case, D. V. M. 1912 (Kansas State Agricultural College), *Pathology*
Sterling

Franklin Arthur Coffman, B. S. 1914 (Kansas State Agricultural College), *Agriculture*
Manhattan

*Bertha Lewis Danheim, B. S. 1920 (Kansas State Agricultural College), *General Science*
Blue Rapids

Percy LeRoy DePuy, B. S. 1918 (Kansas State Agricultural College), *Agriculture*
Manhattan

*Rudolph Henry Driftmier, B. S. 1920 (Iowa State College), *Education*
Manhattan

*Merrill Augustus Durland, B. S. 1918 (Kansas State Agricultural College), *Mechanical Engineering*
Manhattan

Zanoni Bell Freeman, B. S. 1921 (Oklahoma A. and M. College), *Chemistry*
Enid, Okla.

*Charles Reese Gearhart, B. S. 1920 (University of Missouri), *Dairy Husbandry*
Gilbert, Pa.

*George Albert Gemmell, B. S. 1917 (Kansas Manual Training Normal School), B. S. 1920 (Kansas State Agricultural College), *Education*
Manhattan

*Harold Reed Guilbert, B. S. 1920 (Kansas State Agricultural College), *Animal Husbandry*
Manhattan

*Lawrence William Hartel, A. B. 1911, B. S. 1912 (Central Wesleyan College), B. S. in Education 1915 (University of Missouri), *Physics*
Trimble, Mo.

*Chester Albern Herrick, B. S. 1921 (Kansas State Agricultural College), *Zoölogy*
Colony

*Walter Rawlins Horlacher, B. S. 1920 (Kansas State Agricultural College), *Animal Husbandry*
Colby

*Stanley Paul Hunt, B. S. 1919 (Kansas State Agricultural College), *Architecture*
Manhattan

*John Clifford Jenkins, B. S. 1921 (Pennsylvania State College), *Chemistry*
Pittsburgh, Pa.

*Charles Otis Johnston, B. S. 1918 (Kansas State Agricultural College), *Agronomy*
Manhattan

*Mildred Kaucher, B. S. 1921 (Kansas State Agricultural College), *Home Economics*
St. Joseph, Mo.

*Elizabeth Emily Kirkpatrick, B. S. 1920 (Kansas State Agricultural College), *Home Economics*
Belleville

*Karl Knaus, B. S. 1914 (Kansas State Agricultural College), *Education*
Manhattan

*William Vincent Lambert, B. S. 1921 (University of Nebraska), *Animal Husbandry*
Manhattan

*Walter Leroy Latshaw, B. S. 1912 (Pennsylvania State College), *Chemistry*
Manhattan

*Russell Newton Loomis, Ph. C. 1915, B. S. 1917 (University of Colorado), *Chemistry*
Manhattan

*Paul Campbell McGilliard, B. S. 1916 (Kansas State Agricultural College), *Agriculture*
Manhattan

* Members of the K. S. A. C. Faculty.

*Bess Jane McKittrick, A. B. 1912 (University of Kansas), *Home Economics*
Wilson

*David Leslie Mackintosh, B. S. 1920 (University of Minnesota), *Animal Husbandry*
Manhattan

*Paul LeRoy Mann, B. S. 1918 (Kansas State Agricultural College), *Chemistry*
Manhattan

*Caroline May Perkins, A. B. 1919 (New Hampshire College), *General Science*
Manhattan

*William Francis Pickett, B. S. 1917 (Kansas State Agricultural College), *Horticulture*
Manhattan

*Luella Schaumburg, B. S. 1920 (Kansas State Agricultural College), *Agriculture*
LaCrosse

*Charles Henry Scholer, B. S. 1914 (Kansas State Agricultural College), *Civil Engineering*
Manhattan

*Jesse Sellers, B. S. 1921 (University of Colorado), *Chemistry*
Boulder, Colo.

*Ellis Adolph Stokdyk, B. S. 1920 (University of Wisconsin), *Botany*
Manhattan

*Ray Iams Throckmorton, B. S. 1911 (Pennsylvania State College), *Agronomy*
Manhattan

*Ruth Kathryn Trail, B. S. 1919 (Connecticut College for Women), *Home Economics*
Poquonock, Conn.

*Everett Tunnicliff, D. V. M. 1921 (Kansas State Agricultural College), *Bacteriology*
Manhattan

Francis Marion Wadley, B. S. 1916 (Kansas State Agricultural College), *Entomology*
Wichita

Florence Peppiatt Warren, B. S. 1916 (Kansas State Agricultural College), *Home Economics*
Manhattan

Ray Bates Watson, B. S. 1921 (Kansas State Agricultural College), *Animal Husbandry*
Wichita

*Ernest Blaine Wells, B. S. 1917 (West Virginia University), *Agronomy*
Manhattan

Graduate Students Not Working Toward Master's Degree

*Nellie Aberle, B. S. 1912, M. S. 1914 (Kansas State Agricultural College), *English*
Manhattan

*Harold Allen, B. S. 1920 (University of Colorado), *Education*
Manhattan

Dora Otto Aubel, B. S. 1912 (Kansas State Agricultural College), *Chemistry*
Riley

*Harold Barr, B. S. 1919 (University of Colorado), *Education*
Manhattan

*Hubert Bingham Beckwith, B. S. 1912 (Georgia Institute of Technology), *Education*
Manhattan

Albert Leroy Berry, B. S. 1912 (Kansas State Agricultural College), *Education*
Manhattan

*Charles John Bradley, B. S. 1920 (Purdue University), *Engineering*
Manhattan

*Paul Porter Brainard, B. L. 1909 (Whitman College), A. M. 1913 (Columbia University) *General Science*
Manhattan

*Jesse Lamar Brenneman, B. S. 1908 (University of Chicago), E. E. 1913 (University of Wisconsin), *Education*
Manhattan

*Esther Bruner, B. S. 1920, M. S. 1921 (Kansas State Agricultural College), *General Science*
Manhattan

*Leland Everett Call, B. S. 1906, M. S. 1912 (Ohio State University), *Botany*
Manhattan

*Walter William Carlson, B. S. 1908, M. E. 1916 (Kansas State Agricultural College), *Education and Engineering*
Manhattan

*Alfred Lester Clapp, B. S. 1914 (Kansas State Agricultural College), *Agricultural Economics*
Manhattan

Robert Lemuel Clute, B. S. 1896 (Michigan Agricultural College), *Education and Agriculture*
Ionia, Mich.

*Lowell Edwin Conrad, B. S. 1904, C. E. 1906 (Cornell College), M. S. 1908 (Lehigh University), *Education*
Manhattan

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* Members of the K. S. A. C. Faculty.

*Ina Foote Cowles, B. S. 1901 (Kansas State Agricultural College), *Household Economics*
Manhattan

*Neil Edwin Dale, B. S. 1918 (Kansas State Agricultural College), *Agronomy*
Manhattan

*Charles Deforest Davis, B. S. 1921 (Kansas State Agricultural College), *Agronomy*
Manhattan

*Earle Reed Dawley, B. S. 1919 (University of Illinois), *Engineering and Education*
Manhattan

*Frank Andrew Dawley, B. S. 1895 (Kansas State Agricultural College), *Economics and Sociology*
Manhattan

*Howard Robert DeRose, A. B. 1918 (University of Colorado), *Bacteriology*
Manhattan

*Helen Elizabeth Elcock, A. B. 1907 (College of Emporia), *Education*
Wichita

*Morris Evans, B. S. 1920 (Kansas State Agricultural College), *Agricultural Economics*
Manhattan

*Francis David Farrell, B. S. 1907 (Utah Agricultural College), *General Science*
Manhattan

*Ray Flagg, B. S. 1905 (Purdue University), *Education*
Manhattan

Beatty Hope Fleenor, B. S. 1919 (Kansas State Agricultural College), *Education*
Manhattan

*Forrest Faye Frazier, C. E. 1910 (Ohio State University), *Engineering*
Manhattan

*Manford Furr, B. S. 1913 (Purdue University), *Engineering*
Manhattan

Grace Iola Gish, B. S. 1920 (Kansas State Agricultural College), *General Science*
Manhattan

*Roy Monroe Green, B. S. 1914 (University of Missouri), *Agricultural Economics*
Manhattan

*Claude Gustave Hansen, B. S. 1920 (Kansas State Agricultural College), *Engineering*
Manhattan

*Stella Maude Harriss, B. S. 1917, M. S. 1919 (Kansas State Agricultural College), *Chemistry*
Manhattan

*William Patrick Hayes, B. S. 1913, M. S. 1918 (Kansas State Agricultural College), *Agriculture*
Manhattan

*Herbert Henry Haymaker, B. S. 1915, M. S. 1916 (University of Wisconsin), *Education and Sociology*
Manhattan

*Edith Howarth, A. B. 1915 (University of Kansas), *English*
Manhattan

*Katharine Hudson, B. S. 1918 (University of Wisconsin), *Food Economics and Nutrition*
Charleston, Ill.

*Emma Hyde, A. B. 1912, A. M. 1914 (University of Kansas), *Applied Mechanics*
Manhattan

*Edward C. Jones, B. M. E. 1905 (Iowa State College), *Education*
Manhattan

*Ernest Baker Keith, B. S. 1913 (Kansas State Agricultural College), *Chemistry*
Manhattan

*Edward Guerrant Kelly, B. S. 1903, M. S. 1904 (University of Kentucky), *Entomology*
Manhattan

*Royce Gerald Kloeffler, B. S. 1913 (University of Michigan), *Education*
Manhattan

*Amy-Jane Leazenby, B. S. 1917 (University of Missouri), A. M. 1920 (University of Chicago), *General Science*
Manhattan

*Clarence Flavius Lewis, A. B. 1913 (University of Denver), *Engineering*
Manhattan

May Ernestine Long, B. S. 1907 (Kansas State Agricultural College), *Modern Languages*
Manhattan

Geta Lund, B. S. 1921 (Kansas State Agricultural College), *Education*
Manhattan

*James Walker McColloch, B. S. 1912 (Kansas State Agricultural College), *Entomology*
Manhattan

*Mary Whiting McFarlane, B. S. 1894 (University of Wyoming), M. S. 1916 (Oregon Agricultural College), *Education and Sociology*
Manhattan

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* Members of the K. S. A. C. Faculty.

*Joseph Farrington Merrill, B. S. 1907 (University of Maine), *Chemistry*
Manhattan

*James Herbert Moyer, B. S. 1921 (Kansas State Agricultural College), *Agricultural Economics*
Hiawatha

*Charles Nitcher, B. S. 1921 (Kansas State Agricultural College), *Agricultural Economics*
Courtland

*Delos Marquis Palmer, B. S. 1921 (University of Michigan), *Education*
Toledo, Ohio.

*John Huntington Parker, B. S. 1913 (University of Minnesota), M. S. 1916 (Cornell University), *Industrial Journalism*
Manhattan

*Floyd Pattison, B. S. 1912 (Kansas State Agricultural College), *Enginering*
Manhattan

Nellie Maria Payne, B. S. 1920, M. S. 1921 (Kansas State Agricultural College), *General Science*
Manhattan

*Clinton Ellicott Pearce, A. B. 1913, S. B. 1919 (Massachusetts Institute of Technology), *Education*
Manhattan

*Elmer Lamont Rhoades, B. S. 1916 (University of Missouri), *Agricultural Economics*
Manhattan

*Jules Henry Robert, B. S. 1914 (University of Illinois), *Engineering*
Lacon, Ill.

*James Boyles Rogers, A. B. 1916 (University of Kansas), *General Science*
Manhattan

*George Washington Salisbury, B. S. 1915 (University of Illinois), *Sociology*
Manhattan

*Samuel Cecil Salmon, B. S. 1907 (South Dakota Agricultural College), *Agronomy*
Manhattan

*William Henry Sanders, B. S. 1896 (Kansas State Agricultural College), *Education*
Manhattan

*Gabe Alfred Sellers, B. S. 1917 (Kansas State Agricultural College), *Education*
Manhattan

*Arthur Bradley Sperry, B. S. 1919 (University of Chicago), *General Science*
Neodesha

Harry Martin Stewart, A. B. 1920 (University of Kansas), *Education*
Turon

*William Timothy Stratton, A. B. 1906, A. M. 1913 (Indiana University), *General Science*
Manhattan

*Vivan Lewis Strickland, A. B. 1906, A. M. 1915 (University of Nebraska), *General Science*
Manhattan

Arthur Fritiof Swanson, B. S. 1919 (Kansas State Agricultural College), *Botany*
Hays

*Thomas Jesse Talbert, B. S. 1913, A. M. 1917 (University of Missouri), *Agricultural Economics*
Manhattan

*Mary Fidelia Taylor, B. S. 1919 (Kansas State Agricultural College), *Physics*
Newton

*Marion Wesley Todd, B. S. 1921 (Purdue University), *Education*
New Haven, Ind.

*Alonzo Franklin Turner, B. S. 1905 (Kansas State Agricultural College), *Agricultural Economics*
Manhattan

*Harry Bruce Walker, B. S. 1910 (Iowa State College), *Education*
Manhattan

*Roy Wilson Wampler, A. B. 1920 (McPherson College), M. S. 1921 (Kansas State Agricultural College), *Chemistry*
McPherson

*George Benson Watkins, B. S. 1921 (University of Michigan), *Chemistry*
Tunkhannock, Pa.

*Paul Weigel, B. S. 1912 (Cornell University), *Education*
Manhattan

*Edward Staunton West, A. B. 1917 (Randolph Macon College), M. S. 1920 (Kansas State Agricultural College), *Chemistry*
Manhattan

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* Members of the K. S. A. C. Faculty.

*Alfred Everett White, B. S. 1904, M. S. 1909 (Purdue University), *Education and Mathematics*
Manhattan

*Leon Vincent White, B. S. 1903, C. E. 1918 (Kansas State Agricultural College), *Engineering*
Manhattan

*Louis Coleman Williams, B. S. 1912 (Kansas State Agricultural College), *Horticulture*
Manhattan

Ruth Evelyn Willis, B. S. 1921 (Kansas State Agricultural College), *History*
Manhattan

*Ignatius Albert Wojtaszak, B. S. 1920 (University of Michigan), *Education*
Ludington, Mich.

Homer Carlton Wood, B. S. 1920 (Kansas State Agricultural College), *Agriculture*
Manhattan

*Mary Abbie Worcester, B. S. 1917 (New Hampshire College), *Chemistry*
Berwick, Maine.

*James Walter Zahnley, B. S. 1918 (Kansas State Agricultural College), *Agronomy*
Manhattan

Undergraduate Students

The following list includes seniors, juniors, sophomores, freshmen and special students in College. For students in the Summer School and in special courses, see lists following this one.

Abbreviations here used denote curricula as follows: Ag, agriculture; AE, agricultural engineering; Ar, architecture; BC, biochemistry; CE, civil engineering; EE, electrical engineering; Eng, engineering; FME, flour-mill engineering; GS, general science; HE, home economics; IC, industrial chemistry; IJ, industrial journalism; M, music; ME, mechanical engineering; RC, rural commerce; and VM, veterinary medicine.

SENIORS

Kathryn Ruth Adams (HE); Topeka
*James Frederick Adee (VM); Manhattan
Jessie Gertrude Adee (HE); Wells
James Henry Albright (GS); Winfield
Dale Allen (AE); Burlington
Joseph Levi Allen (Ag); Leavenworth
Nelson Henry Anderson (Ag); Neosho Falls
Aldis Lynn Austin (Ag); Manhattan
Lillian Edna Ayers (GS); La Harpe
Vida Mildred Ayers (HE); Sabetha
Mildred Mae Baer (HE); Wichita
Mohammed Monir Bahgat (GS);
Tanta, Egypt
Harriett May Baker (GS); Emporia
Harry Leigh Baker (Ag); Baldwin
Marion Henry Banks (ME); Wichita
Justus Wheeler Barger (Ag); Manhattan
Harold Winthrop Batchelor (GS); Manhattan
Frances Emma Batdorf (HE); Burlington
Burton Bernard Bayles (Ag); Manhattan
Anna Lillian Best (HE); Manhattan
Joseph Ersal Beyer, jr., (EE);
Mooreland, Okla.
Marguerite Bondurant (HE); Ness City
Curtis Clegg Bost (Ag); Matthews, N. C.
Orille Mariette Bourassa (IJ); Topeka
Walter Raymond Bradley (EE); Kidder, Mo.
Marian Elizabeth Brookover (HE); Eureka
Duke Daniel Brown (Ag); Manhattan
Henry Lane Brown (CE); Blue Rapids
Albert Joseph Brubaker (ME); Ellsworth
Orville Kenneth Brubaker (EE); McPherson
Neal Dwight Bruce (Ar); Marquette
Homer Griffin Bryson (IJ); Leon
Robert Lee Bumgardner (CE); Arkan. City
Leslie Burger (HE); Seneca
Earl Frederick Burk (Ag); Ottawa
George Hoffman Bush (EE); Little River
Georgiana Bush (HE); Little River
Elvira Josephine Bussey (GS); Centralia
Oliver Pardee Butler (Ag); Farmington
Lawrence William Byers (Ar); Abilene
Adelaide Elizabeth Carver (HE); Oakley
Frances Casto (GS); Guymon, Okla.
Hortense Caton (HE); Winfield
Marian Chandler (HE); Tulsa, Okla.
Robert Leslie Chapman (EE); Paola
Wallace Jerome Clapp (GS); Logan
Leo Melvin Clark (Ar); Chapman
Roy Engle Clegg (Ag); Altoona
Robert Earl Cleland (Ag); Alma
Sylvester Joy Coe (Ag); St. Augustine, Fla.
Embert Harvey Coles (Ag); Manhattan
Fern Geneva Coles (GS); Manhattan
Gertrude Conn (HE); Kirbyville, Tex.
Harry Hubert Connell (CE); Bazine
Helen Lucille Cooper (HE); Manhattan
Samuel Lynn Copeland (Ag); Hutchinson
Bessie May Coulter (HE); Wichita
Hubert James Counsell (EE); Garden City
Warren Cowell (Ag); Clay Center
Clara Lena Cramsey (HE); McPherson
Georgia Belle Crihfield (HE); Manhattan
Royce Brainerd Crimmin (AE);
Bradford, Mass.
Rolland Miller Crow (EE); Carlinville, Ill.
Oscar Cullen (ME); Lebanon
John Daniel Cunningham (GS); Manhattan
Ruth Lois Cunningham (HE); Manhattan
David Everett Davis (VM); Manhattan

* Under auspices of the United States Veterans' Bureau.

SENIORS—*continued.*

Addison Curtis Depuy (ME); Manhattan
Carl Curt Dethloff (Ag); Kansas City, Mo.
Elizabeth Dickens (IJ); Manhattan
Earl Ralph Romoney (EE); Downs
Clair Ansel Downing (IC); Wichita
Margaret Dubbs (HE); Ransom
Lester Arthur Dumond (GS); Holcomb
Roy Frederick Eckart (ME); Paola
John Burton Elliot (M); Manhattan
Richmond Knostman Elliott (EE); Manhattan
Arnold Joseph Englund (Ag); Falun
Clara Bernice Evans (HE); Liberal
Kenneth Clide Farley (VM); Natchitoches, La.
Glenn Erving Findley (AE); Kiowa
Otto Franklin Fisher (ME); Topeka
Gertrude Evelyn Flowers (HE); Hastings, Neb.
Ruth Floyd (HE); Sedan
Paul Alfred Foltz (GS); Oswego
Asa Herbert Ford (EE); Seneca
Elsie Fulton (HE); Manhattan
Elton Milbert Gard (GS); Stafford
Grace Lillian Gardner (HE); Hutchinson
Truman Olvard Garinger (Ag); Admire
Gerald Lynn Garloch (EE); Garden City
Glen Ernest Gates (CE); Kansas City
David Martin Geeslin (EE); Arkansas City
*Jesse Conrad Geiger (CE); Wichita
James Harry Gillespie (GS); Anthony
George McGrew Glendening (EE); Manhattan
Earl Francis Graves (Ag); Manhattan
Hazel Louise Graves (HE); Manhattan
Theodore Reed Griest (Ar); Topeka
Evan Lawrence Griffith (GS); Manhattan
Leslie Howard Griswold (Ag); Rossville
Garnet Vivian Grover (HE); Iola
Edith Gabriella Grundmeier (HE); Lincoln
Luke Albert Guilfoyle (RC); Wamego
Bertha May Gwin (HE); Morrowville
Charles Francis Hadley (Ag); Huntley, Ill.
Belle Hagans (GS); Manhattan
Mildred Josephine Halstead (HE); Manhattan
Robert Leslie Hamilton (ME); Manhattan
Jean Hanna (GS); Clay Center
Walter Roy Harder (Ag); Minneapolis
Meade Thomas Hargiss (Ag); Manhattan
Ruth Garfield Harrison (HE); Jewell
June Gladys Hartley (GS); Manhattan
Ernest Hartman (GS); Manhattan
Clarence Raymond Hatfield (CE); Wichita
Irene Hays (GS); Manhattan
Grace Headrick (HE); Winfield
Herbert Benjamin Headrick (ME); Winfield
*Clyde Russell Hemphill (Ag); Chanute
*Emra Adam Hepler (Ag); Manhattan
Susan Grace Herr (HE); Medicine Lodge
Perry Joseph Hershey (EE); White Water
Grace Hibarger (GS); Wichita
Frank Hoath (Ag); Anthony
Herman George Hockman (EE); Beattie
Ernest Eugene Hodgson (Ag); Harveyville
Cecil Canum Holmes (Ag); Wellington
Kenneth Oscar Houser (EE); Wichita
Charles Wilbur Howard (IJ); Winona
Clara Belle Howard (HE); Colby
Mable Amanda Howard (HE); Manhattan
Charles Harold Howe (Ag); Chapman
Eric Eugene Huff (Ag); Chapman
May Agnes Hunter (HE); Rock Creek
Edward John Jelden (VM); Columbus, Neb.
*Harry Clayton Jennings (ME); Manhattan
Ralph St. Claire Jennings (EE); Le Roy
Ernest Boisie Johnson (FME); Manhattan
Florence Marguerite Johnson (GS); Manhattan
Tracey Ebbert Johntz (ME); Abilene
Florence Justin (HE); Manhattan
Mohammed Kamal (Ag); Cairo, Egypt
Roy Edwin Kellogg (Ag); Wichita
Carol Susan Knostman (HE); Wamego
William Harold Koenig (Ar); Nortonville
Paul Kovar (EE); Kansas City, Mo.
Emmett Engle Kraybill (Ar); Abilene
Herbert Henry Krehbill (Ag); Moundridge
Maude Ella Lahr (GS); Waynoke, Okla.
Maurice Dee Laine (IJ); Herington
Homer Waldo Larson (ME); Manhattan
Wing Kei Lau (Ag); Canton, China
Walter Frank Law (IJ); Sheridan, Ark.
*Aubrey McDaniel Lee (VM); Manhattan
Vera Louise Lee (HE); Glen Elder
Eva Bell Leland (HE); Wichita
Norman Dale Lund (CE); Protection
Daniel Gail Lynch (ME); Manhattan
Hazel Alma Lyness (HE); Walnut
Harold Joseph McGinley (Ag); Rogers, Ark.
Harold McKeever (Ag); Circleville
James Alexander McKitterick, jr., (VM); Greenwood, Mo.
Paul Marquois McKown (EE); Manhattan
Charles Clyde McPherson (EE); Iola
Katharin Cardwell McQuillen (HE); Clay Center
Helen Esther McStay (GS); Downs
Duella May Mall (HE); Manhattan
Ross James Maltby (Ar); Salina
Louise Helen Manglesdorf (HE); Atchison
Thornton Jason Manry (EE); Manhattan
Ray Eugene Marshall (Ag); Manhattan
William Luther Martin (Ag); Winfield
Rolland Sylvester Mather (Ag); Manhattan
Ezra Perle Mauk (Ag); Hillsdale, Okla.
Rex Maupin (Ag); Manhattan
Orpha Maust (GS); Garden City
Albert Vincent Mead (IJ); Manhattan
Earl Thomas Means (Ag); Everest
Virginia Messenger (HE); Manhattan
Bernice Ellen Miller (HE); Horton
Edith Pearl Miller (HE); Council Grove
John Marshall Miller (EE); Manhattan
Hattie Schaumburg Mitchell (GS); La Crosse
Halford Ernest Moody (Ag); Riley
Jean Moore (HE); Nowata, Okla.
John Morrison Moore (Ag); Stockton
*Clinton Hawthorne Morgan (Ag); Manhattan
Jeptha Jerry Moxley (Ag); Osage City
Donald Dudley Murphy (Ag); Halstead
*Harry Albert Myers (Ag); Americus
Harold Smith Nay (EE); Manhattan
Frank Edward Nordeen (EE); Dwight
Guy Oden (ME); Sterling
Hazel Lucille Olson (HE); Topeka
Vernon Emery Paine (Ag); Admire
Randolph Lindly Palmer (IJ); Jewell
Amos Oliver Payne (ME); Manhattan
John Thomas Pearson (Ag); Parsons
Ruth Jane Peck (GS); Berryton
Cyrus Arthur Perry (Ag); Greenleaf
Florence Utelle Persons (GS); Manhattan
Eva Mildred Platt (HE); Manhattan
Charles Wallace Pratt (IJ); Frankfort
Hally Ralph Priestly (CE); Wichita
James Wendell Pryor (ME); Kansas City
Michael Emil Ptacek (Ag); Emporia
Clarence Benedict Quigley (Ag); Blaine

* Under auspices of the United States Veterans' Bureau.

SENIORS—*concluded.*

Jeremiah Thomas Quinn (Ag); Manhattan
George Joseph Raleigh (Ag); Clyde
Ruth Berneta Rathbone (M); Manhattan
Floyd Ratts (VM); Atlanta
George Harvey Reazin (EE); Manhattan
Oliver Reed (Ag); Manhattan
Henry Irving Richards (Ag); Howard
Carson Basil Roberts (Ag); Manhattan
Gail Catheryn Roderick (HE); Attica
Gladys India Roderick (HE); Attica
Walter John Rogers (FME); Hays
Walter Thomas Rolfe (Ar); Wetmore
Leander Eastwood Rossel (EE); Meade
Thomas Rothrock (GS); Springdale, Ark.
Charlotte Frances Russell (IJ); Winfield
Esther Arrilla Russell (HE); Manhattan
Dorothy Katharine Ryherd (GS); Horton
Morse Henderson Salisbury (IJ); Atchison
Henry William Schmitz (Ag); Alma
Eugene Saxton Scott (Ag); Burlington
Robert Graham Scott (CE);
  Kansas City, Mo.
James Jacob Seright (EE); Colby
Geraldine Frances Shane (M);
  Villisca, Iowa
Clare Liggett Shellenberger (Ag);
  Manhattan
Luella Pearl Sherman (HE); Grinnell
Mac Short (ME); Salina
Ross Jacob Silkett (Ag); Downs
Deal Six (Ag); Versailles, Ill.
Clara Mary Smith (HE); Mound City, Mo.
George Sherman Smith (ME); Independence
Henry Edwin Smith (Ag); Manhattan
Linas Burr Smith (Ar); Hutchinson
Marion Ashton Smith (Ag); Topeka
Labib Boutros Soliman (GS); Cairo, Egypt
Ernest Floyd Stalcup (ME); Hutchinson
Vern Washington Stambaugh (AE);
  Maplehill
Prudence Stanley (HE); Topeka
George Elmer Starkey (Ag); Syracuse
Jay Ralph Starkey (VM); Manhattan
Florence Stauffer (HE); Marion
James Scott Stewart (Ag); Coldwater
Henry Clinton Sturgeon (Ag); Lane
Frank Arvid Swanson (Ag); Manhattan
Harold Irwin Tarpley (EE); Kansas City
Gladys Eleanor Taylor (HE); Chapman
Helen Thayer (GS); Manhattan
Earl Emery Thomas (EE); Argonia
Lola Thompson (HE); Geneseo
Meryl Ethelyn Thornburg (HE); Manhattan
Rowena Malinda Thornburg (GS); Formoso
Charles Albert Thresher (Ag); Jetmore
Eva Lucille Travis (HE); Manhattan
Carl Francis Uhlrich (Ag); Wamego
John Bennett Underwood (GS); Manhattan
Susie Unruh (GS); Pawnee Rock
Hobart Scott Van Blarcom (GS); Manhattan
Ethel Grace Van Gilder (HE); Manhattan
Eva Grace Van Scoik (HE); Aulne
John Waldo Van Vliet (VM); Manhattan
Eugene Haley Walker (Ag); Manhattan
Millard Cummings Watkins (EE);
  Clay Center
Sibyl June Marie Watts (HE); Winfield
Esther Waugh (HE); Amherst, Mass.
William Wallace Weaver (GS);
  Gravette, Ark.
Arthur Weber (Ag); Horton
Marion Welch (HE); Emporia
Cristabel Lucille Whan (IJ); Manhattan
Vorin Edwin Whan (GS); Manhattan
Lawrence Francis Whearty (CE);
  Westmoreland
Herbert Lawrence Wilkins (IC); Manhattan
Claude Merlin Willhoite (Ag); Drexel, Mo.
Fred Woods Williams (VM); Hunter
Roy Williams (Ag); Miami, Okla.
Everett Hoover Willis (Ag); Manhattan
Eugene Willison (GS); Manhattan
Lois Marie Willson (HE); Manhattan
Eva Bee Wilson (GS); Wichita
*Murray Alderson Wilson (CE); Baldwin
William Clyde Wilson (Ag); Manhattan
Jesse Collins Wingfield (Ag); Junction City
Milton Shipman Winter (Ag); Lecompton
Robert Wolnick (GS); Blair
Hubert Earl Woodring (EE); Manhattan
Mabel Lucile Worster (HE); Manhattan
Clemens Harry Young (Ag); Manhattan
Lulu May Zeller (IJ); Manhattan
John Williamson Ziegler, jr., (Ag);
  Lansdowne, Pa.
Charles Zimmerman (ME); Manhattan

JUNIORS

Edith Dorothy Abbott (IJ); Mound Valley
Earl Abbott (EE); Garden City
*Jasper Dorman Adams (Ag); Darlington, Mo.
Warner Adams (Ag); Maplehill
Jesse Levi Allen (Ag); Norwich
Leonard Rhys Allott (Ag); Pueblo, Colo.
Howard Ames (Ag); Downs
Delmar Collins Anderson (CE); Phillipsburg
Lucille Eugenia Anderson (HE); Lindsborg
Violet Anna Andre (HE); Horton
Frank Minton Angus (ME); Sterling
Margaret Pearl Ansdell (HE); Jamestown
Paul McKee Anthony (EE); Westmoreland
Clifford Leland Antle (EE); Emporia
Leola Elnore Ashe (HE); Manhattan
Marjorie Ault (HE); Naponee, Neb.
*Elmer Ausemus (Ag); Cherokee
Oscar Hugh Aydelotte (EE); Manhattan
Agnes Mary Ayers (HE); La Harpe
Marvin Bahl (Ag); Pleasanton
Ralph Waldo Baird (AE); Topeka
Harold Theodore Baker (AE); Tonganoxie
Marcia Helene Baker (GS); Wichita
Herbert Bales (Ag); Manhattan
Margaret Bane (HE); Manhattan
Edna Florence Bangs (GS); Madison
Fred Bangs (Ag); Madison
Galen Barber (EE); Dorrance
Atwell Stewart Barkley (Ag); St. Joseph, Mo.
Lawrence Floyd Barth (Ag); Manhattan
Nelson Suplee Barth (IJ); Manhattan
Elmer Eugene Bates (Ag); Perry
Russell Spencer Beaver (VM); Harlan, Iowa
Douglas Clifford Beeler (Ag); Manhattan
Ralph William Bell (EE); Kinsley
Winifred Margaret Bell (EE); Kinsley
Hattie Betz (GS); Asherville
Perry Betz (IJ); Asherville
Raymond Walstein Binford (CE); El Dorado
James Joshua Black (VM); Carterville, Mo.
Robert Lovell Black (Ag); Amherst, Mass.
William Wayne Blackhall (AE); Sterling
Victor Raymond Blackledge (IJ);
  Junction City
Helen Ann Blair (HE); Mulvane
Roy Eugene Boroff (EE); Manhattan
Bess Hansen Bower (IJ); Manhattan
Leone Cheever Bower (GS); Manhattan

* Under auspices of the United States Veterans' Bureau.

JUNIORS—*continued.*

Chester Leon Bradshaw (EE); Altoona
Carl Brandly (VM); Manhattan
*Albert Lorraine Bridenstine (Ag); Marienthal
Awilda Brown (HE); Winfield
Nina Myrtle Browning (HE); Manhattan
Grace Buchheim (HE); Randolph
William John Bucklee (EE); Manhattan
Hazel Effie Burdette (HE); Severy
William Harold Burgwin (CE); Manhattan
Harris Loree Burnett (IC); Dodge City
Osceola Hall Burr (GS); Manhattan
Belle Bush (HE); Little River
Dwight Calvin Bushey (EE); Muscotah
Claude Raymond Butcher (Ar); Solomon
Carroll Button (Ag); Elmont
Elgin Roy Button (Ag); Topeka
Glen Marvin Case (M); Alta Vista
*Sylvester Ulric Case (Ag); Lyons
Marian Elsie Chaffee (HE); Lasita
Chester Benjamin Chambers (GS); Quenemo
Penn Samuel Chambers (GS); Quenemo
Delmar Dudley Chase (ME); Winfield
Volney Alan Chase (Ar); Manhattan
Kay Iverson Church (AE); Haddam
Dorothy Zella Churchward (HE); Wichita
Ray Samuel Circle (Ag); Kiowa
Charles Haynes Cloud (GS); Winfield
Theodore Dennis Cole (Ag); Arlington
Inez Alice Coleman (HE); Manhattan
Nellie Jane Coleman (HE); Manhattan
*Hubert Lee Collins (Ag); Wellsville
Edith Mae Connery (HE); Sterling
Irene Margaret Conroy (HE); Manhattan
Merl Stanley Cook (AE); Dillon
Merriam Elmer Cook (EE); Bucklin
Donald Corby (EE); Manhattan
Orville Robinson Cragun (GS); Kingman
Earle Crall (EE); Parsons
Frank Wright Crawford (VM); Manhattan
Paul Clarence Cross (EE); Wichita
Thomas Cross (Ag); Belle Plaine
Rose Matilda Cunningham (HE); Manhattan
*Charles Otto Dailey (EE); Garden City
Dora Dean Dakin (GS); Ashland
Cyrus Calvin Davidson (EE); Yates Center
Louis Deal (ME); Newton
Rebekah Deal (HE); Kansas City, Mo.
Orville Marshall Deibler (EE); Manhattan
Alice Louise DeWitt (GS); Medicine Lodge
Edith Dockstader (GS); Manhattan
Lloyd Harold Downing (EE); Colwich
Myrtle Sadie Dubbs (HE); Ransom
*Kent Ruggles Dudley (VM); Iola
Clair Eber Dunbar (Ag); Columbus
*Noel Nardin Dunbar (Ag); Columbus
Helen Vare Dunlap (HE); Eureka
Charles Ebenstein (EE); Manhattan
*Sidney Eberhart (CE); Topeka
James William Eby (CE); Medicine Lodge
Milton Stover Eisenbower (IJ); Abilene
Elizabeth Elledge (HE); Parsons
Frederick Emery (VM); Baldwin
Victor John Englund (CE); Falun
John Harold Epperson (CE); Hutchinson
Lester Edgar Erwin (Ag); Manhattan
*Paul Evans (Ag); Williamstown
Junius Warren Farmer (Ag); Manhattan
Willis Lee Farmer (CE); Kingfisher, Okla.
Katherine Faulconer (HE); Manhattan
Ethel Feese (GS); Manhattan
Herman Vincent Fleming (ME); Nickerson
Roy Lewis Fleming (Ag); Paola
Joseph Patrick Flynn (EE); Palmer
*Timothy Foley, jr., (VM); Chapman
William Darius Foss (VM);
Church's Ferry, N. Dak.
Faval Loranzo Foval (RC); Wichita
Karl Frank (EE); Manhattan
John Edward Franz (GS); Manhattan
Herbert Sawyer French (ME);
Corpus Christi, Tex.
Willis Frudden (Ar); Charles City, Iowa.
Francis Glenn Fry (EE); Waldo
John Silver Fuller (CE); Winfield
Willard Clarence Fulton (AE); Harper
Frederick Augustus Gardner (CE); Louisburg
Hazel Irene Gardner (HE); Hutchinson
Harold Paul Gaston (Ag); Pratt
Clarence Raymond George (Ag); Manhattan
Frank Arthur Gillespie (EE); Garden City
Margaret Gillett (HE); Junction City
Miriam Genevieve Glass (HE);
Springdale, Ark.
John Arthur Glaze (GS); Manhattan
Merle Elmer Goff (Ag); Manhattan
Fannie Harriet Gorton (HE); Manhattan
*Clarence Raymond Gottschall (ME);
Manhattan
Lucille Alma Gramse (HE); Perry
Lloyd George Grandfield (VM); Maize
*Richard Griffenhagen (VM); Pueblo, Colo.
Carl David Gross (AE); Russell
Augustus Wilkes Gudge (ME); Wichita
Florence Antoinette Haack (HE); Florence
Joseph Edward Haag (RC); Holton
Ray Dryer Hahn (Ag); Clay Center
Edith Margaret Haines (IJ); Manhattan
Robb Augustus Hake (ME);
Kansas City, Mo.
Harry Herbert Halbower (GS); Anthony
Lawrence Fener Hall (Ag); Manhattan
Helen Evelyn Hanes (GS); Ottawa
Marian Hardman (GS); Downs
John Elbridge Harner (EE); Keats
Queenie Ester Hart (GS); Minneapolis
June Nellie Harter (HE); St. John
Dick Michael Hartigan (EE); Fairbury, Neb.
*Hugh Enos Hartman (EE); Manhattan
Irwin Lloyd Hathaway (Ag); Sheffield, Iowa.
Terrence Otis Hedrick (CE); Kansas City
Loren Bryce Hefling (ME); Manhattan
Beulah Frances Helstrom (HE); McPherson
Elfrieda Hemker (GS); Great Bend
Herbert Fred Hemker (ME); Great Bend
Joseph Hendrix (CE); Lane
Florence Henney (HE); Horton
Lydia Emma Hessel (GS); Kearney, Mo.
Flora Marie Hill (HE); Manhattan
John Henry Hofmann (CE); Manhattan
Emil Hokanson (CE); Marquette
Bernice Avis Hoke (HE); Manhattan
George Sneer Holland (CE); Kansas City
Glenn Henry Hollister (CE); Manhattan
George Arthur Holloway (RC); Hutchinson
*George Neeley Holmes (Ag); Pasadena, Cal.
Orval Everett Holzer (EE); Girard
*Harold Dunbar Hopkins (EE); Winfield
*Richard Hopper (CE); Manhattan
George Horney (ME); Medicine Lodge
Francis Houlton (Ag); Florence
Frank Whitson Houston (Ag);
Twin Falls, Idaho.
Agnes Howard (HE); Colby
Angie Howard (HE); Colby
John Albert Howarth (VM); Manhattan
Orrin Kem Howe (AE); Manhattan
Helen Harper Howell (HE); Mexico, Mo.
Mae Amelia Humphrey (HE); Manhattan
Loyall Virgil Hunt (Ag); Wilmore
Bruce Charles Hutchins (ME); Ellsworth
Sarah Belle Hyde (HE); Altoona
Donald Bryan Ibach (Ag); Arkansas City
Charles Frank Irwin (CE); Le Roy
Mattie Christine Jackson (HE);
Kansas City

* Under auspices of the United States Veterans' Bureau.

JUNIORS—*continued.*

Robert Louis Jarvis (IJ); Kansas City
Alice Marie Jennings (HE); Zeandale
George Arthur Jennings (EE); Girard
Lester Eugene Jennings (EE); Zeandale
Charles Louis Jobe (EE); Sedan
Anna May Johnson (HE); Manhattan
Ethel Augusta Johnson (HE); Marquette
Louis George Johnson (ME); Manhattan
Mamie Johnson (HE); Manhattan
Frances Allegra Johnstone (IJ); Manhattan
Clifford Charles Jolley (EE); Manhattan
Henrietta Antoinette Jones (GS); Manhattan
Nellie Rose Jorns (HE); Preston
Annette Helen Kanzer (HE); Hutchinson
Harlan Kapka (Ag); Kansas City
Henry Daniel Karns (Ag); Ada
Bert Emerson Keirns (GS); Downs
Mary Frances Kelly (HE); Bucyrus
Frank Willard Kerns (Ag); Baldwin
Sara Blanche Kershaw (HE); Garrison
*Frank Washington Ketchum (VM); Columbia, Mo.
Leland Alfred Kettenring (EE); Salina
Jacob Acil Kibler (CE); Sedan
Ray Stanley Kibler (EE); Sedan
Julia King (IJ); Manhattan
Frank Charles Kingsley (AE); Formoso
*Bertie Ray Kirkpatrick (Ag); Paradise
Glenn Benson Kirkwood (VM); Marysville
Irvin Bernell Kirkwood (CE); Marysville
Forrest Kitch (Ag); Rozel
Ruth Kathryn Kittell (HE); McPherson
Ila Thelma Knight (HE); Jamestown
Louis Myers Knight (Ag); Medicine Lodge
Kathleen Knittle (GS); Manhattan
Elsie Agnes Knox (M); Leon
Iva Mayra Kopp (HE); Hiawatha
Zella Kouns (HE); Manhattan
George Deaner Lambert (Ag); Stella, Neb.
*Fred Franklin Lampton (Ag); Cherokee
Ralph Cole Lapsley (GS); Burlington
Frank Larner (CE); Oskaloosa
Elmer Hamlet Larson (VM); Forman, N. Dak.
Helen Pauline Larson (GS); Manhattan
Elden Leasure (VM); Solomon
William Leeper (ME); Goff
Syble Ingovar Leighton (HE); West Helena, Ark.
Amy Lemert (GS); Cedar Vale
Fred Clarence Lewis (GS); Baldwin
Rose Olive Lewis (HE); Ottawa
Reuben Carl Lind (Ag); Zeandale
Ching Sheng Lo (VM); Canton, China
Grace Beatrice Long (HE); Cuervo, N. Mex.
Glen Longley (CE); Lebanon
Robert Siegrist Love (CE); Kansas City
Laura Elizabeth McAdams (HE); Salina
Ruth Eleanor McCandless (HE); St. John
Winfred Owen McCarty (Ag); Ames
Ethel Irene McConnell (HE); Russell
Paul McConnell (GS); Merriam
Helen Margaret McDonald (HE); Manhattan
Lawrence Dewey McDonald (ME); Parsons
Frederick McCloy McElhinney (EE); Manhattan
*Howard Hutcheson McGee (Ag); Olathe
*James Clyde McKay (IC); Kennett, Mo.
Andrew James McKee (VM); Manhattan
*Wilbur Samuel Magill (ME); Topeka
Mary Ellen Maroney (HE); Manhattan
Gerald Clay Marrs (ME); Bradford
Sarah Margaret Mason (HE); Belle Plaine
William Joseph Matthias (Ag); Perry
Anabel Irene Maughlin (HE); Sylvia
Lester Hounell Means (EE); Everest
Lloyd Earl Means (EE); Kansas City
Lelia Mabel Meeker (HE); Waldo
*Henry John Melcher (EE); Concordia
Marjorie Melchert (HE); Ottawa
Eva Rebecca Mellenbruch (M); Hiawatha
George Meyer (EE); La Crosse
Keith Walter Miller (RC); Portis
Victor Henry Miller (VM); Linville, Va.
Helen Margaret Mitchell (HE); Topeka
Cecil Moore (RC); Manhattan
Esther Ann Moore (HE); Protection
Hazel Edna Moore (HE); Hays
Nellie Dael Moore (HE); Protection
Raymond Herbert Moran (GS); Claflin
Johannes Frederick Theobald Mostert (Ag); Balfour, South Africa
Louisa Saloma Moyer (HE); Hiawatha
Alice Martha Mueldener (GS); Lyons
Edward John Mueller (CE); Washington
Mabel Ardis Murphy (M); Nickerson
Guy Archibald Murray (CE); Manhattan
Vincent Werner Nass (EE); Atchison
Jesse Harold Neal (AE); Williamsburg
Harry Nelson (CE); Bennington
Lestle Wilbur Newcomer (CE); Alexander
Raymond Clyde Nichols (IJ); Buffalo
Edith Berenice Nonken (HE); Manhattan
Alpha Irene ONeil (HE); Paola
Elver Wayne Osbourn (CE); Randolph
Alford Robb Paden (Ag); Broughton
Merl Lee Padgett (Ar); Manhattan
Cecile Beatrice Paine (HE); Admire
Dwight Patton (Ag); Crisfield
Mildred Lorene Pence (GS); Dunavant
Ralph Henry Peters (EE); Manhattan
Nettie Josephine Pfaff (HE); Beloit
Walter Edgar Pfundstein (EE); Chanute
*Samuel Pickard (Ag); Kansas City, Mo.
Don Homer Pickrell (ME); Leon
Norman Vincent Platner (ME); Ellis
Bernice Slane Prescott (HE); Parsons
Helen Jeannette Priestley (HE); Kansas City
Ruby Elizabeth Pruitt (HE); Goddard
Elsie Inez Puckey (HE); Clay Center
Newton Quain (Ag); Canton, China
Helen Louise Rabe (HE); Axtell
Harry Elijah Ratcliff (Ag); Gaylord
Margaret Marian Reasoner (IJ); Herington
Gordon Redman (Ar); Kansas City
Leona Maxine Reed (HE); Ottawa
Louise Eilene Reed (HE); Ottawa
Thomas Bernard Reed (CE); Glasco
*Walter Hosea Reed (EE); Manhattan
Roger Eli Regnier (Ag); Wamego
Margaret Reich (IJ); Glen Elder
Sarah Hazel Richards (HE); Howard
Ruby Anna Ricklefs (HE); Troy
Harold Barrows Riley (Ag); Kansas City
Rowland Morris Ritchie (EE); Ottawa
Glenn Rixon (Ag); St. John
Mott Luther Robinson (Ag); Lowemont
Shirley Nugent Rogers (GS); Manhattan
Lloyd Edwin Rogler (Ag); Cottonwood Falls
Lillian Rommel (GS); Waterville
*Paul McKinley Roote (IC); Eskridge
Renna Regina Rosenthal (HE); Topeka
Glenn Rucker (AE); Burdett
Gretchen Rugh (HE); Abilene
Charles Guy Russell (Ag); La Crosse
Edna Blanche Russell (HE); Manhattan

* Under auspices of the United States Veterans' Bureau.

JUNIORS—*concluded.*

Dorsey Sanders (VM); Manhattan
Lois Lucia Sargent (HE); Manhattan
Ira Ferdinand Schindler (GS); Valley Falls
Grace Aurora Schwandt (HE); Manhattan
Susie Scott (HE); Madisonville, Ky.
Harold Leon Sebring (RC); Gardner
Opal Sarah Seeber (GS); Great Bend
Gerald Clair Sharp (Ag); De Witt, Neb.
Frank Howard Shirck (Ag); Waterville
Margaret Evelyn Shrader (HE); Cedar Vale
Walter Shutts (ME); Hays
Wesley Earl Simpson (Ag); Welda
Percy Sims (Ag); Little River
Leland Otis Sinderson (EE); Manhattan
Charles Randolph Smith (IJ); Herington
Rollin James Smith (CE); Topeka
Sarah Frances Smith (HE); Durham
Stephen Ray Smith (GS); Manhattan
Thelma Enid Smith (GS); Manhattan
Verna Elizabeth Smith (HE); Manhattan
William Donald Smith (RC); Hutchinson
Clarence Martin Spencer (FME); Emporia
Harold Crane Spencer (IJ); Baldwin
Katherine Pearl Spiker (HE); Emporia
Robert Cleveland Spratt (CE); Kansas City
Harry Jack Staib (EE); Turon
Marion Stauffer (GS); Marion
Florence Margaret Stebbins (GS); Ellis
John Steiner (GS); White Water
Theodore Roosevelt Stickel (Ag); Manhattan
Fred Stockebrand (Ag); Yates Center
Glenn Dale Stockwell (Ag); Larned
Carl Robert Stout (ME); Kansas City
Euphemia Faith Strayer (HE); Lawrence
Wilma Sutton (HE); Kingman
Robert Swenson (Ar); Lindsborg
George Ellis Taylor (Ag); Hiawatha
Rush Urban Taylor (VM); Oshkosh, Wis.
Joseph Eugene Thackrey (GS); Manhattan
Josephine Thorn (GS); Beattie
Leona Esther Thurow (HE); Macksville
William Wesley Trego (ME); Sedgwick
Orval Welton Tripps (CE); Waldo
*Floyd Tucker (ME); Minneola
Paul Tupper (IJ); Lecompton
Charles Lee Turley (RC); Hutchinson
Joseph George Tustison (EE); Yates Center
James Lowell VanGilder (Ag); Manhattan
Mable Irene Vincent (GS); Sterling
Iro Nelson Vowel (Ag); Anness
Florence Elizabeth Waits (HE); Cassoday
Myrtle Irene Coleman Waits (GS); Manhattan
Frank Edward Walbridge (EE); Kansas City, Mo.
Wirt Dudley Walton (Ag); Leavenworth
Logan Byron Warlick (GS); Manhattan
*Rees Conway Warren (ME); Dull Center, Wyo.
Eleanor Emily Watson (HE); El Dorado
Margaret Jane Watson (IJ); Turon
Robert Lee Welton (Ag); Fairview
Albert Parken Wertman (Ag); Washington
Zoe Dorothy Wertman (HE); Washington
Ruth Ida Whearty (HE); Westmoreland
James Albert Wheeler (GS); Marion
Webster James White (ME); Ada
Fred Erie Whitehead (Ag); Manhattan
Wiley Whitney (GS); Troy
Susanne Whitten (HE); Wakarusa
*Henry Evert Wichers (Ar); Downs
Howard Williams (EE); Kiowa
*Cecil Cline Wilson (Ag); Canton
Donald Maxwell Wilson (CE); Atchison
Ella Inez Wilson (HE); Luray
Fred Wilson (Ar); Kinsley
Hazel May Wilson (HE); Luray
John Cathcart Wilson (GS); Manhattan
John Leod Wilson (GS); Ottawa
George Hugh Winters (RC); Downs
Chester Stanly Wood (Ag); Manhattan
Orin Chester Wood (EE); Topeka
Lucille Elizabeth Woodward (M); Wichita
Daniel Marion Woodworth (Ag); Sedan
Alden Baker Woody (IJ); Lincoln
Frank Worster (IC); Manhattan
Leroy Lawrence Wurst (EE); Russell Springs
Donald Albert Yandell (VM); Wilson
Harrol Veere Zimmerman (RC); Great Bend

SOPHOMORES

Emily Adams (IJ); Maplehill
Helen Lucile Adams (M); Everest
Ralph Adams (RC); Norton
Glenn Allen Aikins (Ag); Valley Falls
Agnes Aldridge (GS); Kansas City
Frank McDaniel Alexander (Ag); Wellington
George Max Allen (EE); Topeka
Harriett Jane Allen (M); Leavenworth
Frances Myrtle Allison (M); Florence
Earl Beverly Amos (EE); Burlingame
Eunice Miriam Anderson (M); Phillipsburg
George Randolph Anderson (CE); Kansas City
Ivan Edward Anderson CE); Topeka
Raymond Armantrout (Ag); Friend
Alfred Lewis Arnold (Ag); Manhattan
Harold Coleman Ashe (M); Manhattan
Anthony Paul Atkins (Ag); El Dorado
George Smith Atwood (Ag); La Cygne
Clara Louise Ausherman (HE); Ramona
Madalyn Avery (GS); Wakefield
Harold Benton Axtell (EE); Topeka
Ellis Buchanan Babbit (Ag); Willis
Alma Margaret Baer (HE); Steamboat Springs, Colo.
Mary Elizabeth Bahan (HE); Independence
Alvin Banman (Ag); Lyons
Dahy Baskett Barnett (IJ); Manhattan
Florence Anne Barnhisel (HE); Wichita
Frank Roy Barnhisel (RC); Wichita
Bethel Louise Barrett (HE); Lillis
Edith Elizabeth Barrett (GS); Topeka
Reuel Vernon Barrington (Ag); Sedan
Martin Clyde Barrows (Ag); Clifton
James Harley Barry (ME); Manhattan
*Guy Charles Bartgis (Ag); Cedar Vale
Gerald Dunnell Barton (EE); Oxford
Theodore Lawrence Bayer (IJ); Manhattan
Claude Oran Beckett (ME); El Dorado
Virgil Arthur Berridge (Ag); Manhattan
Blanche Lorraine Berry (M); Jewell
Lenore Faydette Berry (IJ); Jewell
Fred Goff Billings (Ar); Manhattan
Lucia Blitz (GS); Manhattan
Cloina Bixler (HE); Manhattan
Edith Oretta Blackwelder (HE); Pratt
*Floyd Arthur Bleger (FME); Manhattan
William Carl Boatwright (RC); Manhattan
Mildred Hazel Bobb (HE); Newton
Orlin Ernest Bonecutter (GS); Pratt
Carl William Bower (Ag); Manhattan
Allen Ward Boyce (RC); Minneapolis
Helen Florence Boyd (GS); Spearville
Earl Huff Bradley (CE); Winfield
George William Bradley (Ag); Memphis, Tex.

* Under auspices of the United States Veterans' Bureau.

SOPHOMORES—*continued.*

Thelma Irene Bradley (GS); Kidder, Mo.
Richard Willard Brann (CE); Mound City
Dan Matthew Braum (Ag); Denison
Verna Breese (GS); Wichita
George Thomas Bronson (VM); Waldo
Amelia Blanche Brooks (HE); Manhattan
Francis Neil Brooks (CE); Peru
Lawrence Bickhart Brooks (Ag); Garrison
Ted Arthur Brown (GS); Fall River
William Elijah Brown (Ag);
Walnut Grove, Mo.
Chester Leroy Browning (Ag);
Kingsville, Mo.
Hugh Carl Bryan (Ag); Osage City
Lewis Jay Bryan (IJ); Manhattan
Reubin Cooper Bryant (CE); Drexel, Mo.
*Joseph Daniel Buchman (Ag); Council Grove
Guy Emerson Buck (EE); Salina
John Buckman (ME); McPherson
Joe Evans Burge (CE); Topeka
Francis Paul Burke (VM); Manhattan
Harley Kercher Burns (ME); Liberal
George Harold Burroughs (ME);
Binghamton, N. Y.
*Hiram Gilbert Burt (Ag); Garden City
Mary Penelope Burtis (GS); Manhattan
Archie Williams Butcher (IC); Solomon
Floyd Charles Butel (GS); Carbondale
Ina Butts (GS); Manhattan
Esteban Agnilor Cabacungan (EE);
Isabela, P. I.
Jose Victor Cajucom (AE); Manila, P. I.
*Matthew John Calto (Ag); Columbus, Neb.
Jessie Campbell (HE); Attica
Chester John Henry Canary (GS); Clyde
Florence Carey (GS); Manhattan
Dale Harry Carmean (Ag); Manhattan
Herbert Harold Carnahan (Ag); Garrison
Ralph Edwin Casebourn (IC); Neodesha
Edward Jost Chapman (CE); Leavenworth
Francis Eugene Charles (IJ); Republic
Ralph Emerson Chase (EE); Severy
Burl Quintin Chubb (Ag); Baxter Springs
Boyd Ransom Churchill (Ag); Fiatt, Ill.
Carl Wesley Clair (Ag); Manhattan
Jesse Timberlake Clapp (CE); Logan
Kenneth Franklin Clark (Ag); Lascar, Colo.
Leta Ruth Clark (HE); Eskridge
Lois Amelya Clark (GS); Delphos
Malcolm Jerome Clark (IJ); Lascar, Colo.
Mary Jane Clark (HE); Anthony
Eugene Arthur Cleavinger (Ag);
Leavenworth
Verne Ole Clements (EE); Havensville
Charles Robert Clothier (ME); Manhattan
Dwight Coburn (GS); Kansas City
Roy Arthur Coe (ME); Fayetteville, Ark.
Burton Ellsworth Colburn (Ag); Manhattan
Wilber Cole (CE); Topeka
Louis James Combs (EE); Burden
Jewel Irene Conkel (HE); Niles
Mildred Althea Conkel (HE); Niles
William Amy Conrow (GS); Manhattan
Thomas Alfred Constable (ME);
Minneapolis
Stella Grace Cook (HE); Bucklin
Charles James Coon (VM); Manhattan
Elsie Leigh Cope (GS); Irving
*Metheny John Copeland (EE); Quinter
Marie Correll (GS); Manhattan
Clifton Gail Cox (Ag); Sedgwick
Leith Beniamin Crilly (CE); Galva
Scott Dougherty Criswell (Ag); Manhattan
Walter Tanner Crotchett (Ag); Louisburg
Helen Golda Crow (M); Dighton
Edward Cunningham (IJ); Manhattan
Clifford Wilkin Currie (IJ); Manhattan
Alan Davis Dailey (IJ); Poseyville, Ind.
May Danheim (HE); Blue Rapids
Harry Lindsay Davidson (HE); Topeka
*Edgar William Davis (Ag); Lyons
Eleanor Hannah Davis (GS); Gaylord
Frances Marie Dawley (HE); Manhattan
Ruth Wilkes Day (GS); Longton
Birdie Ethel Dean (HE); Nickerson
Samuel Wesley Decker (Ag); Birmingham
Donald Reid De Tar (EE); Anthony
*Clyde Charles Dilley (GS); Beattie
*William Kenneth Dinklage (CE); Fort Scott.
*Charles Orville Dirks (Ag); Wichita
Eva Christine Dittmar (HE); Manhattan
Launa Myrtle Divelbiss (HE); Olathe
Leonora Katherine Doll (GS); Larned
Henry Dougherty (CE); Manhattan
Dorothy Fleming Dugan (GS); Manhattan
Benjamin Hederstrom Dutton (IC);
Burlingame
William Pryor Dwelle (Ag); Cedar Point
Alberta Edelblute (GS); Manhattan
Alfred Douglas Edgar (AE); Ashland
George Graham Edgerton (EE); Canton
Allison Boyd Edwards (EE); Herington
Winifred Maude Edwards (HE); Athol
John William Egger (Ag); Ellis
Harold George Ehrhardt (Ag); Westphalia
Dean Archibald Elliott (Ar); Mayetta
Leslie Maxwell Epard (RC); Colby
Lyle Wayne Ernst (Ag); Manhattan
Shelley Hiram Estes (Ag); Edgerton
Irene Antoinette Etzold (HE); Liberal
Mary Catherine Etzold (HE); Liberal
Alfred Lealand Evans (CE); Miltonvale
James Glen Evans (IC); Chanute
Edith Fairchild (HE); Topeka
Lewis Harold Fairchild (GS); Almena
Margaret Anne Falconer (HE); Kansas City
Bertha Faulconer (HE); El Dorado
Laura Catherine Fayman (GS);
Kansas City, Mo.
George Albert Filinger (Ag); Cuba
Solomon McCammon Finney (Ag); Emporia
Bernice May Flemming (HE); Manhattan
Vernett Edward Fletcher (Ag); Manhattan
Eugene Stevenson Floyd (RC); Salina
Carl Edgar Fogleman (ME); Parsons
Esther Cleta Folsom (HE); Manhattan
*Kenney Lee Ford (Ag); Seneca
Addison Forrester (GS); Manhattan
Marie Ruth Foster (HE); Topeka
Lee William Frager (EE); Washington
Edward Raymond Frank (VM); Manhattan
Neosho Louise Fredenburg (HE);
Council Grove
John Charles Frey (Ag); Manhattan
Herbert Levi Frisbie (Ag); Grantville
Martin Frederick Fritz (GS); Clay Center
Josephine Adelia Fulcher (HE); Piper
Otis Fred Fulhage (EE); Yates Center
Beatrice Edith Gaither (HE); Kansas City
Margaret Ruth Gallemore (HE); Manhattan
Leo Emerson Garrison (CE); Linconville
Herbert Otis Garth (EE); Strong City
Sam Peter Gatz (Ag); McPherson
Mary Grace Gerkin (M); Riley
Clark Knight Gibbon (EE); Hartford
Josephine Gill (HE); Attica
Verlin Gilpin (RC); Codel
Henry Herman Gittrich (Ag); Wichita
Clarence Fay Gladfelter (Ag); Emporia
Albert Arthur Goering (RC); Moundridge
Dewey Aaron Goerke (Ag); Sterling

* Under auspices of the United States Veterans' Bureau.

SOPHOMORES—*continued.*

Hilda Lenora Goff (HE); Randolph
Veneta Frances Goff (HE); Randolph
Vernon Cecil Golden (EE); White Water
Otis Gould, jr., (Ag); Manhattan
Emmett Stanley Graham (RC); Manhattan
Charles Clayton Griffin (Ag); Nickerson
Nellie Elizabeth Griffith (HE); Elmont
Gladys Cansada Gritz (GS); Fall River
Lou Wesley Grothuson (ME); Ellsworth
Lola Leeontine Gudge (GS); Wichita
Ernest Hugh Guyer (GS); Protection
Charles Frederick Hagberg (RC); Clay Center
Francis Lester Haggard (ME); Topeka
Don Hall (GS); Oakley
Emmor Weir Hall (RC); Oakley
Alma Loraine Hallowell (GS); Greenleaf
*Hector Wilfred Harris (CE); Horton
Jerry Milton Harris (Ag); Eudora
Mildred Louise Hart (HE); Kansas City
William James Hartgroves (Ar); Wamego
John Merrill Hartigan (Ag); Fairbury, Neb.
Carl Bernard Hasenyager (EE); Bern
Floyd Chester Healea (CE); Wichita.
Philip Heartburg (IC); Manhattan
Polly Hedges (HE); Hutchinson
Vera Doolittle Hedges (GS); Blue Mound
Edwin Hedstrom (Ag); Manhattan
Fred Earl Henderson (EE); Dodge City
Merle Revere Henre (EE); Kansas City
Elizabeth Spears Hepler (GS); Manhattan
Olive Hazel Hering (IJ); Stafford
Ray Edward Herman (ME); Kingman
Mabel May Herr (HE); Medicine Lodge
Donald Myron Herrick (RC); Kinsley
Frank Byron Heter (Ag); Sterling
Austin Theodore Heywood (Ag); Bennington
Randall Conrad Hill (GS); Manhattan
Grace Irene Hinnen (GS); Potwin
Lee Wayne Hinshaw (IC); Wa Keeney
Brom Dwight Hixson (Ag); Wa Keeney
Harold Wesley Hobbs (IJ); Manhattan
Howard McNeice Hobbs (RC); Lebanon
Harold William Hoffhines (GS); Manhattan
Harold Andrew Hoffman (CE); Harper
Paul Frederick Hoffman (IC); Manhattan
Russell Carl Hoffman (Ag); Haddam
Theodore Thomas Hogan (FME); Junction City
Claude Gale Holden (Ag); Ford
Lois Holderbaum (HE); Kansas City
Geneva Hollis (HE); Fredonia
*Earl Fremont Hoover (VM); Manhattan
Max Manley Hoover (Ag); Burlingame
Hollis Raymond Hope (GS); Garden City
Phil Hope (GS); Garden City
Elmer Hopp (FME); Manhattan
Clara Luella Howard (M); Manhattan
Frank Lucian Howard (Ag); Manhattan
Bert Howell (GS); Shaw
*Charles Bannus Hudson (Ag); Fort Scott
Lelia Mary Hughes (GS); Kansas City, Mo.
Esther Alden Huling (HE); Manhattan
Ihla Geraldine Hull (GS); Manhattan
Hazel Maude Hulse (M); Manhattan
Hazel Humbarger (HE); Salina
James Norman Hume (EE); Humboldt
*George Humphrey (Ag); Manhattan
Margaret Fern Humphreys (HE); Manhattan
Wilbur William Humphrey (RC); Manhattan
Helen Hunt (HE); Natoma
Helen Hutchins (HE); Kansas City
Susie Katharon Huston (HE); Manhattan
Bertha May Hyde (GS); Altoona
Fred Irwin (Ag); Manhattan
Hal Francis Irwin (Ag); Manhattan
Chester Lowell Ives (GS); Independence
Richard Eugene Jansen (ME); Ottawa
Berenice Clara Jarvis (HE); Kansas City
Ramon Quintin Javier (VM); Cadiz, P. I.
*Fred Talbot Jenkins (Ar); Manhattan
Ralph William Jenkins (RC); Perry
Robert Doah Jenkins (EE); Kinsley
Mary Eleanor Jenson (HE); Waterloo, Iowa
Arthur Johnson (ME); Vliets
Carl Daniel Johnson (EE); Manhattan
Conrad Hastings Johnson (EE); Latimer
Earl Gladstone Johnson (AE); Manhattan
James Frank Johnson (Ar); La Crosse
Julia Jeanette Johnson (HE); Herington
Paul Eugene Johnson (IJ); Wamego
Robert Bruce Johnson (Ag); Salina
Walton Alfred Johnson (ME); Vliets
Harold William Johnston (ME); Kipp
Charley Archer Jones (Ag); Manhattan
Leta Marie Jones (HE); Wellington
George Harold Joy (FME); Salina
Ralph Julien (IJ); Wamego
William Harold Jury (CE); Topeka
Eulalia Ferne Kaiser (HE); Hillsboro
Herbert Lee Kammeyer (IJ); Manhattan
Pauline Keith (HE); Manhattan
Karl Ernest Keller (EE); Kinsley
Louis Donald Keller (Ag); Le Roy
Eugene Edward Kelly (GS); Wichita
Ira David Sankey Kelly (CE); Grand Junction, Colo.
Cecil Earl Kielhorn (Ag); Cambridge
*Russell Stanley Kifer (Ag); Springfield, Mo.
Gilbert Raymond Killian (VM); Manhattan
Ferris Francis Kimball (FME); Kansas City
Elmira Wesson King (HE); Elsmore
Jordan Carroll King (IC); Ewing Ill.
Oscar Edward Kinkead (Ag); Troy
Lucille Kinnamon (IJ); Larned
Victor Lee Kirk (ME); Iola
Walter Kiser (IJ); Udall
Nilie Charlotte Kneeland (GS); Kismet
Dorothy Maude Knittle (M); Manhattan
Julius Henry Kolbus (RC); Garden City
Schuyler Franklin Kollar (Ag); Woodward, Okla.
Snoda Grace Grider (HE); Burns
*Gustave Louis Krieger (VM); Hamilton, Ohio
Laurene Adra Kuns (M); McPherson
Charles Glen Kuykendall (RC); Twin Falls, Idaho
Charles Otto Lain (CE); Parsons
Marie Helen Lamson (HE); Paola
Raymond Charles Lane (Ar); Manhattan
Carl Theodore Larson (Ag); Scandia
Tull Cress Lasswell (CE); Manhattan
Charles Spencer Lawrence (RC); Emporia
Velma Mary Lawrence (IJ); Manhattan
Eugenia Harris Lee (M); Manhattan
*John Clyde Lentz (EE); Holton
Carroll Leonard (ME); Manhattan
James Michael Leonard (EE); Newton
Ruth Evangeline Leonard (GS); Manhattan
Willis Lloyd Lesher (CE); Dodge City
*George Daniel Lingelback (EE); Minneola
Frank Bertrand Linn (Ag); Manhattan
Earl Milo Litwiller (Ag); Freeport
Madeline Maxine Locke (HE); Erie
William Karl Lockhart (EE); Humboldt
Herbert Melvin Low (EE); Topeka
Ruth Viola Luginbill (HE); Greensburg
Clarence Joseph Lydick (EE); Anthony
Elvera Christine McCammon (GS); Manhattan
Betty McCoin (HE); Wichita
Jennie McComb (HE); Topeka

* Under auspices of the United States Veterans' Bureau.

SOPHOMORES—*continued.*

Nellie Rebecca McComb (HE); Topeka
Russell Emery McConkley (CE);
Lawton, Okla.
Henry Landon McCord (ME); Manhattan
Sidney Allyn McCracken (GS); Overbrook
Basil Cyrus McCue (Ag); Garden City
Garold Alford McDonald (GS); Frederick
Marietta McIntosh (HE); Burns
Florence McKinney (HE); Great Bend
*Earl Jeremiah McWilliams (Ag); Alta Vista
Cary Reid Machir (Ag); Kansas City, Mo.
Joseph Taylor Mackay (Ag);
Kansas City, Mo.
Aden Combs Magee (Ag); Manhattan
Alice Manley (GS); Cheney
Frances Emily Mardis (HE); Preston
Vivian Anna Marley (GS); Phillipsburg
Leslie Louis Marsh (Ag); Chanute
James Fletcher Marshall (CE); Grenola
Alice Tweed Marston (GS);
Wilmington, Del.
Ross Wesley May (ME); Holton
Colletta Mayden (GS); Manhattan
Rolla Daniel Mayden (CE); Manhattan
Clyde Westel Means (AE); Derby
Dorothy Mebus (HE); Kansas City
Alfred Edgemont Meek (Ag); Idana
*Edward Winebright Merrill (GS); Le Roy
Alva Ernest Messenheimer (EE); Admire
Roxie Meyer (GS); Wamego.
Jose Angel Mier (Ag);
Aguascalientes, Mexico
Andrew John Miller (VM);
West Bend, Iowa
Buford John Miller (Ag); Piedmont
Frank Miller (ME); Cambridge
Raymond Mather Miller (CE); Centralia
William Taylor Miller (VM);
Los Angeles, Cal.
Ethyl Mills (HE); Manhattan
Lena Josephine Moore (HE); Wakarusa
Bud Wesley Morford (ME); Augusta
George DeVore Morris (ME); Manhattan
Sarah Sylvania Morris (HE); Manhattan
Genevieve Elizabeth Mott (HE); Herington
Louise Mowry (M); St. Joseph, Mo.
Harry Forest Moxley (Ag); Osage City
Albert Diedrich Mueller (Ag); Hanover
George Vernon Mueller (ME); Sawyer
Ralph Muir (Ag); Salina
Meria Kathleen Murphy (HE); Perth
John Kenneth Muse (Ag); Manhattan
Nancy Mary Mustoe (HE); Norton
Bernice Eola Myers (M); Manhattan
Walter Emory Myers (Ag); Eskridge
Eugene Frank Nelson (CE); Junction City
Margaret Nettleton (HE); Lenora
Jessie Adelaide Newcomb (HE); Garnett
Dewey Newcombe (RC); Great Bend
Ralph Merrill Nichols (CE); Osage City
Glenn Nesbitt Niquette (ME); Salina
Owen Nolf (Ag); Bennington
Ruby May Northrup (GS); Cuba
John Evans Norton (Ag); Grainfield
Mary Esther Nuttle (HE); El Dorado
Lillian Belle O'Brien (IJ); Manhattan
Zoe O'Leary (HE); Phillipsburg
Floyd Robert Oliver (CE); Neodesha
Mary Elizabeth O'Neil (GS); Prescott
Ignacio Ortiz (IC); Cueramaro, Mexico
Lawrence Lewis Osborn (GS);
Veedersburg, Ind.
Lowell Henry Paddock (AE); Lakin
James Edward Parker (RC); Paola
Goldie Ruth Paslay (M); Puente, Cal.
George Walter Pate (EE); Nickerson
Naola Deane Patterson (M); Erie
Robert Patterson (Ag); Ellsworth
*Fred Harold Paulsen (Ag); Stafford
Ona Vivian Peak (M); Manhattan
William Pears (EE); Clay Center
*Royce Owen Pence (FME); Colby
Harold Clinton Perry (GS); Russell
Edward Peter (RC); Cuba
Alma Eleanore Petrasek (HE); Jennings
Sylvia Irene Petrie (GS); Pratt
Austin Harold Pfeiffer (EE); Hamlin
Don Scott Pfuetze (RC); Manhattan
George Edward Phillips (CE); Yates Center
Paul John Phillips (EE); Paola
Dorothy Pickard (HE); Kansas City, Mo.
Mary Willisine Pilant (HE); Wellington
Rudolph Paul Plagge (ME); Belle Plaine
Raymond Covert Plyley (EE); Lyndon
Roy Gaylon Porter (EE); Norton
Sybil Alma Porter (HE); Fredonia
John Charles Post (GS); Manhattan
Earl Lewis Preston (CE); Gordan
Otto Leroy Pretz (Ag); Olathe
Joe Price (Ag); Valley Falls
Virgil Dale Proctor (RC); Norton
Dorothy Hortense Pugh (GS);
Muskogee, Okla.
Joseph John Quinn (Ar); Salina
Margaret Elizabeth Raffington (HE);
Hutchinson
Ernest Lee Raines (Ag); Louisburg
Walter Patrick Raleigh (Ag); Clyde
Simeon Baniaga Rambac (ME);
Solano, P. I.
William Rankin (CE); Manhattan
*Alfred Lee Rapp (IC); Manhattan
Evan Earl Rath (ME); Agenda
Robert Smith Rath (GS); Agenda
Anne Louise Ratliff (IJ); Manhattan
Hershel Henry Rayle (Ar); Osawatomie
Edith Viola Reece (HE); Riley
Hervey Omer Reed (EE); Cassoday
Ruth Shannon Reed (HE); Cassoday
Ernest Leo Reichhart (Ag); Toledo, Ohio
Helen Elizabeth Reid (HE);
Cheyenne, Wyo.
Harold William Retter (CE); North Topeka
Frederick Thomas Reyling (AE);
Kansas City, Mo.
Forrest Reynolds (EE); Phillipsburg
Winifred Blanche Rhodes (HE); Anthony
Mark Duncan Rice (Ag); Cullison
John William Richards (Ag); Manhattan
Doris Ione Riddell (GS); Salina
Arthur Howard Riley (VM); Manhattan
Ivan Harris Riley (Ar); Newton
Durward Belmont Rising (RC); Salina
Frank Barton Robb (CE); Scott City
Charles Wesley Roberts (IJ); Oskaloosa
Max Duane Roberts (Ag); Pomona
Lester George Robinson (GS); Galesburg
Thomas Ewing Rodgers (IC); Manhattan
Mary Jane Roesener (HE); Manhattan
Arthur Lincoln Rogers (EE); Hays
Roland Edmond Roney (Ag); Scranton
Paul Gibbons Roofe (Ag); Spring Hill
Mayetta Roper (HE); Barnes
Herbert Arthur Rose (EE); Waldron
John Whiteley Rose (Ar); Luray
Arthur Warwick Rucker (CE);
Council Grove
Easborn Rusco (ME); Clifton
Mary Katherine Russell (HE); Elkhart, Ind.
Orpha Eilleen Russell (M); Manhattan
*Roy Cecil Russell (Ag); Soldier

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SOPHOMORES—*concluded.*

Sylvia Lanora Russell (GS); Lyons
Robert McSellon Sallee (ME); Marion
Jewell Jennie Sams (HE); Kansas City, Mo.
Dorothy Louise Sanders (M); Leavenworth
William Sartorius (ME); Garden City
Abraham Rabie Saunders (Ag);
Boshof, South Africa
Christine Saunders (HE); Manhattan
George Roach Saunders (RC); Pleasanton
*Glen Ransom Sawyer (ME); Moline
Robert Saxton (Ag); Manhattan
Ruby Sarah Saxton (HE); Manhattan
Lawrence Schaal (Ag); Zeandale
Elwyn Scheel (EE); Emporia
Emelie Louise Schneider (HE); Kansas City
Charles Frederick Schultz (Ag); Manhattan
Grace Dorothy Schultz (HE); Manhattan
Everett Clifford Scott (Ag); Galena
Madge Marian Scott (HE); Kansas City
Ruth Emilie Scott (M); Kerwin
Richard Maurice Sears (Ag); Eureka
Jeannette Ellen Seaver (HE); Seneca
Lester Ralph Sellers (ME); Great Bend
Paul Morse Shaler (EE); Topeka
Randall Joel Shaw (CE); Medicine Lodge
Alfert Ross Shepard (CE); Chapman
Ralph William Sherman (Ag); Burlington
Robert Theodore Shideler (CE); Girard
Lillian Gertrude Shimmick (M); Jennings
Frank LeeRoy Simpson (CE); Spearville
*Joseph William Skinner (RC); La Harpe
Clarence Everette Slater (Ar); Arkansas City
Earl Smith (Ag); Pratt
Herbert Clayton Smith (Ag); Longton
James Royalton Smith (EE); Osborne
Joe Leonard Smith (EE); Garden City
Paul Eugene Smith (RC); Herington
Ray Leonel Smith (EE); Washington
Samuel Lewis Smith (ME); Mount Hope
Harold William Smythe (CE); Wichita
Neva May Solt (HE); Waterville
Vivian Melancthon Solt (ME); Manhattan
Myron Homer Soupene (Ar); Manhattan
Mae Estella Sower (HE); Elmo
Maurice Burnett Spear (Ag); Bushong
Bernice Murle Spence (M); Hanover
Loyd Ancil Spindler (Ag); Garnett
Glenn Wesley Spring (EE); Manhattan
Ross George Stapp (CE); Norcatur
Arthur Raymond Stark (Ag); Goodland
Ethel Mary Stateler (HE); Goodwell, Okla.
Carl Edward Steenson (CE); Waterville
Everett Olden Stephens (RC); Abilene
Anna Caroline Stewart (HE); Morganville
Rachel McCune Stewart (HE); Winchester
Theodore Still (IC); Tonganoxie
Thomas Bruce Stinson (Ag); Manhattan
Alfred Leonard Stockebrand (Ag); Vernon
Gladys Arena Stocker (HE); Concordia
Warren Edward Stone (Ag); Saffordville
Austin William Stover (Ag); North Topeka
Raymond Luther Stover (Ag); Topeka
Clark Oliver Stratford (CE); El Dorado
Fred David Strickler (Ag); Hutchinson
*Richard Raymond Stucky (Ag); Moundridge
Otto Engel Steuber (ME); Parsons
Theodore Stueber (Ar); Parsons
Opal Janelle Swarens (HE); Hutchinson
*Joseph Frank Swarner (EE); Hartford
Hazel Marie Sweet (HE); Manhattan
Mildred Swenson (IJ); Clay Center
Harry Alcid Swim (EE); Manhattan
Elbridge Webster Symns (ME);
Ingersoll, Okla.
Oliver Ellsworth Taintor (Ag); Wichita
Ruth Harris Tarpley (HE); Emporia
William Henry Teas (Ag); Lenexa
Lila Pearl Tecter (HE); Canton
Nellie Alvera Tecter (HE); Canton
Harold Hetherington Theiss (EE);
Hutchinson
*Leo Albert Thogmartin (CE); Fort Scott
Norris Ray Thomasson (CE); Parsons
Melville Samuel Thompson (GS); Manhattan
Mildred Hazel Thornburg (M); Manhattan
John Hollis Tole (ME); Independence
Louis David Trager (RC); Bucklin
Josephine Victoria Treadway (HE); La Harpe
Florence Ellen True (HE); Perry
Ethel Florence Trump (HE); Russell
Daniel Overton Turner (Ag); Milton
Nina Winilla Uglow (HE); Ames
Verne Leon Uhland (Ag); Rozel
Anna Louise Uhlrich (HE); Wamego
Anna Jean Unruh (HE); Pawnee Rock
Helen Margaret Van Gilder (IJ); Manhattan
Elizabeth Alice Van Ness (HE); Topeka
*Paul Anthony Vohs (IJ); Osawatomie
George Ellsworth Voiles (CE); Manhattan
Walter Henry von Trebra (Ag); Oswego
Arrilla Wadsworth (M); Cottonwood Falls
Ida Jane Walker (HE); Manhattan
Joe Chadwick Wallace (Ag); White City
Leola Wallace (M); Villisca, Iowa.
*Isom Raymond Ward (EE); Tampa
William Everett Wareham (RC); Manhattan
George Russell Warthen (Ag);
Webb City, Mo.
John Wesley Wasson (ME); Peru
Edward Watson (Ag); Osage City
Virginia Elizabeth Watson (HE);
Ash Grove, Mo.
Nora Elaine Watters (HE); Axtell
Curtis Watts (M); Winfield
Lavina Amelia Waugh (M); Oskaloosa
Ruth Louise Webb (IJ); Tonganoxie
Howard Gilbert Webber (RC); Dodge City
Norman Nathaniel Weberg (Ag); Salina
George Herman Weckel (EE); Garnett
Mary Dorcas Weir (GS); Newton
William Joseph Welker (AE); Coffeyville
Floyd Lavern Werhan (EE); Bennington
Frank Loy Westerman (EE); Manhattan
Thelbert Leroy Weybrew (EE); Wamego
George Smith Wheeler (GS); Topeka
Zana Margaret Wheeler (HE);
Des Moines, Iowa.
Margaret Maxwell White (HE); Parsons
Bracewell Dighton Whitehead (Ar); Abilene
Maude Irene Whitehead (GS); Abilene
Adelaide Louise Wieters (HE); Lanham
Miriam Louise Wight (GS); Salina
John Camp Wilkins (CE); Kansas City
Francis Hall Wilkinson (Ar); Sedgwick
*Francis Reid Williams (EE); Broughton
Lewis Rexford Williams (EE); Topeka
Raymond Williams (VM); Rosedale
Maurice Marion Williamson (Ag);
Kansas City, Mo.
Oral Martin Williamson (Ag); Kansas City
Marie Isabella Willis (M); Manhattan
Ivan Venton Wilson (IC); Tonganoxie
Karl Marx Wilson (IJ); Concordia
*Manry Ray Wilson (EE); Luray
Paul Raymond Wise (CE); Clearwater
Clell Burns Wisecup (EE); Leoti
Audra Wolf (HE); Jennings
Philip Redding Woodbury (Ag); Olivet
Gilberta Woodruff (RC); Parsons
Oscar Griffith Woody (Ar); Lincoln
Lucile Woulfe (GS); Ardmore, Okla.
Franklin Neal Wray (CE); St. John
Bernie William Wright (Ag); Arkansas City
Mildred Ione Wright (HE); Washington
Jacob Glenn Yawger (Ag); McCracken
Raymond Yoder (EE); Newton

* Under auspices of the United States Veterans' Bureau.

FRESHMEN

Ramona Abrams (M); Arkansas City
Joseph Omer Abbott (GS); Lawrence
Ruth Frances Ackors (HE); Ellsworth
Arvid Waldemar Adell (GS); Marquette
Marion Francis Aiman (CE); Manhattan
Charles Leonard Alberding (ME); Kiowa
Walker Reed Alexander (IJ); Ness City
Richard Allan (RC); Manhattan
Thelma Winifred Allan (HE); Manhattan
Ruth Louise Althoff (IJ); Topeka
William George Altimari (EE); Parsons
Anne Susie Amstutz (HE); Halstead
Robert Louis Anderes (Ag); Kansas City
Bernice Anderson (HE); Lawrence
Cora Christina Anderson (HE); Neosho Falls
Maggie Mae Anderson (HE); Neosho Falls
Merlin Edwin Anderson (EE); Leonardville
Inez Virginia Archer (GS); Hiawatha
Leah Ellen Arnold (HE); Manhattan
Ulysses Sam Arnold (EE); Kansas City
Anthus Willard Attebery (EE); Parsons
Walter Henry Atzenweiler (Ag); Huron
Charles Beatty Ault, jr. (CE); Brownell
William Myril Axe (GS); Corning
John Henry Ayars (Ag); Keats
Vivienne LaVonne Babb (HE); Douglass
Ruth Bachelder (GS); Fredonia
Jewell Klanmann Baecht (FME); Clyde
Vergil Klinger Baecht (EE); Clyde
Louis William Baily (EE); Herington
Evelyn Bernice Bair (HE); Topeka
Edith Blanche Baird (HE); Topeka
George Myron Baker (CE); Wichita
Guy Norveil Baker (Ag); Syracuse
Harold Sumner Baker (EE); Downs
*Marvel Leon Baker (Ag); Syracuse
Lester Charles Balderston (CE); Stockton
John William Ballard (CE); Almena
Vivian Clarice Ballinger (M); Junction City
August Irvin Balzer (Ag); Inman
Ralph Robert Bane (AE); Manhattan
Irene Bridget Barner (HE); Wellington
Dorothy Barnes (HE); Topeka
Myrl Gould Barnhisel (HE); Wichita
Calvin Edward Barry (EE); Meriden
Paul Baum Bascom (IC); Topeka
Vincent Edward Bates (Ag); Kansas City, Mo.
Willard Everett Bates (CE); Dodge City
Laurence Edwin Baty (EE); Manhattan
Dorothy Bayer (HE); Manhattan
Virginia Fair Beatty (HE); Kansas City, Mo.
Paul Louis Beaubien (Ag); Lamar, Colo.
Virginia Elizabeth Beeson (GS); Harper
Marcia Alice Beggs (HE); Washington
Everett Ernest Bell (RC); Manhattan
Helen Ruth Bell (HE); Attica
Herbert George Bell (Ag); New Cambria
Drew Edward Bellairs (Ag); Cherryvale
Lloyd Charles Belt (CE); Columbus
Howard Orville Bennett (EE); Wamego
Wilmer Cline Bennett (FME); Concordia
Elsie Kathryn Bergstrom (M); May Day
Floye Leona Berridge (HE); Goff
Theodore McKinley Berry (EE); Manhattan
Newell Emmet Bert (Ag); Detroit
Flossie Maude Beyer (HE); Holton
Roscoe Asia Beyer (Ag); Arrington
Earl John Bickel (RC); Washington
Aubrey Ellsworth Bilger (EE); Hunter
Fern Opal Bixler (HE); Manhattan
Maurice John Black (Ag); Lebo
Sarah Hilda Black (HE); Lewis
Nellie Valera Blackwood (HE); Manhattan
Tina Blanchard (GS); Kansas City
Lynden Ira Blazier (CE); Morland
Ruth Elizabeth Boal (GS); Clifton
Margaret Alice Boell (GS); Wamego
Josephine Wrong Boggs (M); Concordia
Walter Henry Bohnenblust (RC); Riley
Dorotha Ruth Bonar (HE); Manhattan
Nellie Marguerite Booth (HE); Fairview
Bert Howard Born (GS); Morland
John Francis Bostwick (EE); Junction City
Emogene Bowen (HE); Manhattan
Hazel Bowers (HE); Downs
Leslie Jenks Bowman (EE); Lebo
Howard Christopher Boydston (EE); Sterling
Donald Robert Boylan (EE); Arkansas City
Everett Finley Braden (CE); Wakefield
Eugene Loyal Brady (EE); Manhattan
Thomas Bragg, jr. (IJ); Dodge City
Neil Bailey Brainerd (EE); White Water
Esta Breeden (M); Lenora
James Floyd Breeding (EE); Topeka
Margaret Angeline Brenner (IJ); Waterville
Miriam Elizabeth Brenner (HE); Waterville
Grace Elizabeth Bressler (GS); Manhattan
Clara Edith Brock (HE); Axtell
Vera Marguerite Brooks (M); Hutchinson
Edward Lewis Brower (VM); Junction City
Dorothy Jean Brown (HE); Newton
Gerald George Brown (ME); Junction City
Harold Eugene Brown (CE); Longford
Howard Roy Brown (EE); Riley
John Channing Brown (GS); Blue Rapids
Lorene Elizabeth Brown (HE); Kansas City
Vira Brown (HE); Norton
*William Scott Brown (RC); Circleville
Esther Brownrigg (HE); Mont Ida
Fred Brunkan (GS); Ellinwood
Russell Buck (ME); Topeka
Gladys Elizabeth Bumgardner (HE); Holton
Kerney Richardson Bunker (ME); Kansas City, Mo.
Mary Gwendolyn Bunsold (HE); Cullison
Jessie Viola Burkwin (M); Manhattan
Phyllis Winifred Burtis (HE); Manhattan
Glenn Keith Buss (CE); Udall
Vida Faye Butler (GS); Great Bend
Lottie Mae Butts (GS); Manhattan
Effie Mae Butz (GS); Oneida
George Henry Callis (GS); Chase
Harold Edwin Callis (GS); Chase
Benjamin Augustine Campbell (Ag); Denison, Tex.
Jesse Clair Campbell (EE); Wa Keeney
Roger Campbell (RC); Macksville
Mary Elvene Capper (HE); Ames
Lamar Perkins Caraway (VM); Logansport, La.
Gladys Mae Carden (HE); Langdon
John August Carlson (EE); Maplehill
Waldon Noble Carlson (ME); Randolph
Arnold Jackson Carmean (EE); Manhattan
Joseph Carroll (RC); Chapman
Lilia May Carroll (M); Alma
*Mott Titus Carroll (Ar); Wichita
*Doyle Henry Carter (Ag); Trenton, Mo.
*Sherman Harold Carter (EE); Le Roy
Garland Cartwright (Ag); Perryton, Tex.

* Under auspices of the United States Veterans' Bureau.

FRESHMEN—*continued.*

Fern Vida Case (M); Alta Vista
James Park Caster (GS); Manhattan
Gertrude Faire Cate (IJ); Manhattan
Gertrude Claire Catlin (HE); Fairbury, Neb.
William Ferguson Cavenaugh (Ar); Fort Riley
Margaret Elma Chandley (GS); Kansas City
Edna Neeta Chapin (HE); Westphalia
Kenneth Romayne Chappell (IJ); Norton
Grovener Cecil Charles (CE); Wichita
Esther Olive Chase (HE); Protection
George Kenneth Chew (EE); Manhattan
Nathan Goodman Chilcott (EE); Mankato
Ralph Bennett Chilcott (ME); Mankato
Mildred Jane Churchill (HE); Manhattan
Luther Circle (Ag); Kiowa
Charles Samuel Clapper (IJ); Minneola
Iva Bernice Clark (GS); Hutchinson
Johnathon Paul Clark (RC); Garden City
Orem Richard Clency (EE); Manhattan
Geneva Gladys Clevenger (HE); Manhattan
Callie Coates (HE); Greensburg
Paul Cobb (EE); Wellington
Otto Richard Coburn (CE); Preston
Evelyn Charlotte Colburn (HE); Manhattan
Herbert Burns Colby (EE); Abilene
Elwood Edgar Coleman (GS); Manhattan
Marjorie May Collins (HE); Wellsville
Mary Ellen Collins (HE); Wellsville
Helen Adelia Colton (HE); Dover, Okla.
Clarence Dow Compton (EE); Wichita
Morton Daniel Conrad (ME); Topeka
Helen Martha Connett (HE); Axtell
Ida Augusta Conrow (HE); Manhattan
Bernard Conroy (Ag); Manhattan
Grace Constable (GS); Minneapolis
Floyd Carl Cooley (GS); Neodesha
Elizabeth Helen Coons (M); Manhattan
Mabel Myrtle Cooper (M); Hannibal, Mo.
Esther Ruby Copas (HE); Valley Falls
Margaret Corby (M); Manhattan
Lester Ellis Covert (CE); Topeka
Marie Elizabeth Cramb (HE);
Gladstone, Neb.
Aletha Belle Crawford (HE); Stafford
Garvin Merle Crawford (EE); Leon
Floyd Hunter Creighton (EE); Manhattan
Edwin Thomas Croft (RC); Larned
Elmer Remington Crooks (Ag); Topeka
Willis Harold Cuddy (RC); Manhattan
Grace Ruby Curl (HE); Olsburg
Beth Suzanne Curry (HE); Manhattan
Grace Marie Currin (HE); Manhattan
Ivan Verne Curtis (Ag); Blue Mound
Lyle Cushing (CE); Downs
Russell Dwight Dade (EE); Hutchinson
Gladys Pauline Dallas (HE); Harveyville
William Alsop Dalton (GS); St. George
Walter Jones Daly (Ag); Tucson, Ariz.
Georgia May Daniels (M); Wichita
Ethyl Adeline Danielson (HE); Concordia
Ina Willametta Davidson (HE); Ramona
Dorothy Davies (GS); Manhattan
Daisy Davis (HE); Cawker City
Eileen Marie Davis (HE); Morganville
Florence Lanora Davis (HE); Holton
Frank Davis (EE); Hiawatha
George Stuart Davis (CE); Clay Center
Mildred Minerva Dawson (HE); Nickerson
Laura Virginia Deal (HE); Kansas City, Mo.
Helen Sarah Deely (HE); Norton
Elsa Fern Deeter (HE); Norcatur
Everett Leo Deeter (EE); Norcatur
George Harold Delfelder (Ag); Effingham
Eleanor Elizabeth Dempsey (GS); Manhattan
Lloyd Alvin Deniston (RC); Manhattan
Robert Michael De Wald (EE); Russell.
Hugh Alfred De Water (ME); Hutchinson
Dorothy May De Wolf (HE); Garnett
Mary Sisson Dey (HE); Wellington
Emory Marion Dial (Ar); Topeka
Donald May Diefendorf (GS); Riley
Frank Huston Dilts (EE); Augusta
William Louis Divilbiss (EE); La Cygne
*John Francis Doane (EE); Topeka
Melda Naomi Dobie (HE); Eureka
Maurelle Dobson (RC); Winfield
Dorothy Irene Dodge (M); Abilene
Charles Edward Dominy (ME); Atwood
Lowell Charles Domoney (EE); Downs
Arthur Doolen (Ag); Kinmundy, Ill.
Neil Dougherty (GS); Manhattan
*Gerald Roderick Dowd (VM);
San Francisco, Cal.
Oswald Benton Dryden (EE); Hoisington
Eugene Paul Dudey (Ag); Conway Springs
Leslie Hehner Dudey (ME); Conway Springs
George Leo Dunagan (EE); Douglass
John Owen Dunbar (Ag); Columbus
Florence Belle Durham (M); Norton
*Herbert Ivan Durham (EE); Norton
Kattie Dora Eberhard (HE); White Water
Charles Otto Eberwein (Ag); Lawrence
John Amond Eble (EE); Lyons
Homer Lee Edgell (CE); Leavenworth
Lois Adeline Edgerton (M); Randolph
Lester Lynn Edwards (Ar); Leonardville
Bertha Mattie Egger (HE); Ellis
Blanche Elliott (HE); Caney
William Elliott (IJ); Newton
George Forbes Ellis (Ag);
Lovington, N. Mex.
Orin Ellis (AE); Phillipsburg
Charlotte May Elmendorf (HE);
Temple, Tex.
Herschel Ona Elwyn (CE); Girard
Delbert Frederick Emery (GS); Parsons
George Malcolm Emrich (EE); Longford
Russell Barton Enfield (GS); Iola
Winfred Wells England (EE); Tecumseh
Iva English (M); Leavenworth
Hester Roberta Ensminger (GS); Nickerson
Hazel Elaine Eplee (M); Parsons
Alice Ericson (M); Lindsborg
Charles Leslie Erickson (IC); Fort Scott
Anna Roxana Erikson (GS); Junction City
Forest Noble Erwin (M); Pratt
Clifford Wayne Eshbaugh (CE); Manhattan
Harold Waldo Evans (EE); Manhattan
James Bowers Ewing (AE); Iola
Lionel Gilmore Ewing (EE); Great Bend
Opal Marie Ewing (HE); Great Bend
Ralph Emerson Ewing (AE); Manhattan
Evelyn Leone Fairbanks (M); Woodston
James Lyster Farrand (Ag); Hunter
Elmer Fatzer (GS); Fellsburg
Katie Marguerite Fearey (HE); Anness
Vesta Rosalind Ferris (HE); Delphos
Leonard Thomas Finch (Ag); White Water
Dale Ronald Finney (CE); Topeka
Francis Eugene Finnin (CE); Bushton
Alice Fisher (GS); Manhattan
*Charles Raymond Fitch (Ag); Miltonvale
Mark Hays Flick (FME); Manhattan
*Elmo Ford (CE); Blaine
Gordon Ellis Ford (ME); Burlingame
Beulah Edna Forrester (HE); Wamego
Robert Miles Forrester (RC); Manhattan
*Asbur William Foster (EE); Paden, Okla.
Frank Gallardo Fraitag (Ag);
Uyuni, Bolivia
Rae Frank (RC); Manhattan
Audrey Genevieve Freeman (HE);
Junction City
Hilma Marie Freeman (GS); Courtland

* Under auspices of the United States Veterans' Bureau.

FRESHMEN—*continued.*

Cullin George Frey (IC); Fort Morgan Colo.
Dorothy Mabel Frost (HE); Blue Rapids
Hilda Hyacinth Frost (IJ); Blue Rapids
David Earl Fry (EE); Oakhill
Frances Opal Gaddie (HE); Bazaar
Woodburn Gailey (EE); Sharon Springs
Dorothy Isabel Gallemore (HE); Manhattan
Ralph Gants (CE); Gardner
Willis Ewart Garratt (EE); Lawrence
John French Gartner (IJ); Manhattan
Estelle Gertrude Gates (HE); Kingman
Harold Verne George (IJ); Dodge City
Lee Chetwyn German (EE); Coldwater
Charles Raymond Gilbert (AE); Manhattan
Mildred Gillespie (HE); Harper
Harold Leeton Gillman (CE); Salina
Lester Gish (EE); Abilene
Olive Ruth Glaze (HE); Wellington
John Glenn (EE); Jetmore
Ira Edward Goddard (RC); Phillipsburg
Herbert Albert Goreing (RC); Moundridge
*John Calvin Goheen (ME); Clay Center
Kenneth Calvin Goodell (RC); Independence
Wallace Chester Goodell (RC); Independence
Mary Lois Gorton (HE); Manhattan
Edgar Harrison Gossard (Ag); Oswego
Thelma Gossard (GS); Topeka
Walter William Graham (AE); Manhattan
Thelma Green (HE); Mankato
Ella Gregory (GS); Emporia
Delna Irene Grieve (HE); Turon
Neal Dean Grieve (EE); Osborne
Ivan Abraham Grimes (EE); Woodston
Frank Perry Gross (Ar); Abilene
Ben Grosse (Ag); Jamestown
Charles Lewis Gunn (FME); Great Bend
Aelize Bertha Haack (HE); Florence
Wallace Frederick Haas (CE); Stafford
Forrest Hagenbuch (Ag); Troy
Florence Ina Haines (HE); Haven
Kenneth Waldo Halbower (Ag); Anthony
John Prentiss Hale (GS); Downs
Vivian Hall (HE); Clinton, Mo.
Mary Edith Haller (HE); Admire
Gertrude Claire Hamilton (HE); Wichita
Velma Hammond (M); Kansas City, Mo.
George David Hanna (RC); Clay Center
Alice Martha Hannen (IJ); Detroit, Mich.
Agnes Cecil Hannum (IJ); Corning
Wesley Richmond Hansen (CE); Wichita
Floyd Vivian Hanson (ME); Assaria
Wilbur Henry Hanson (FME); Concordia
Clarence Leslie Harder (Ag); Minneapolis
George Thomas Harkins (CE); Ottawa
Margaret Harper (GS); Marion
Florence Harris (HE); Manhattan
Paul Washington Harris (BC); Havensville
Hope Mildred Harrison (GS); Hugoton
Bernard Cecil Harter (GS); El Dorado
Wilma Gwendolyn Hartley (HE); Manhattan
Allen Paul Hartman (IJ); Frankfort
Herbert Herman Harvey (EE); Galena
Donald Griffith Hassebrock (CE); Riley
Ethel May Hassinger (M); Parsons
Emma Kate Hassler (HE); Chapman
Gustave Herman Haubold (GS); Paxico
Everett Haukenberry (GS); Manhattan
Carolyn Jessie Hawkinson (HE); Clyde
Theodore Adams Haynes (EE); Madison
John Herman Heald (EE); Goff
Doris Lurendra Healey (IJ); Sharon Springs
Barton Heath (EE); Fairbury, Neb.
Senn Hunter Heath (ME); Enterprise
James Dow Hedberg (GS); Falun
Marjorie Elizabeth Heimerich (GS); Clay Center
William George Heller (Ag); Hunter
Walter Dedrick Hemker (AE); Great Bend
William Alvin Henderson (GS); Leonardville
*George Elwin Hendrix (Ag); Manhattan
Alda Martha Henning (HE); Burlington
Martin Henrichs (Ag); Humboldt
John George Henry (GS); Glasco
Carl McKinley Henson (EE); Nickerson
Eleanor Lucile Herr (IJ); Hutchinson
Francis Floyd Herr (Ag); Medicine Lodge
Jewell Kathryn Herr (GS); Medicine Lodge
Ernest Earl Herren (RC); Manhattan
Julian Herrera (Ag); Mexico City, Mexico
Joseph Herrin (IJ); Dodge City
Margaret Kathryn Heshion (M); Manhattan
Edgar William Heyl (EE); Wallace
Floyd Franklin Higbee (Ag); Carlton, Colo.
Clara Mae Higdon (M); Talmage
Mary Adelia Higinbotham (GS); Manhattan
Frederick Byron Hill (RC); Lecompton
*James Vernon Hill (EE); Manhattan
Raymond Meridith Hill (EE); Burrton
Verne Clifford Hill (VM); Manhattan
Leland Stanford Hobson (EE); Kingman
Ruth Laura Hochuli (GS); Holton
Claude Allen Hodshire (ME); Coffeyville
Lenna Roberta Hodson (HE); Wichita
Iva Luella Holladay (HE); Dodge City
Walter Wright Holladay (EE); Kingman
Clifford Andrew Hollis (EE); Fredonia
Theodore Cole Hollis (GS); Delphos
Edith Holsinger (IJ); Rosedale
Chester Elmer Hommon (CE); Smith Center
Clara Honeywell (GS); Manhattan
Margaret Mary Hopkins (GS); Kansas City
Frederick Charles Horan (Ag); St. Joseph, Mo.
*Jennie Horner (HE); Ashland
George Christopher Horning (CE); Victor
William Nelson Hornish (CE); Pratt
Allen Gerald Hotchkiss (EE); Manhattan
Lynn Jackson Houser (GS); Fort Collins, Colo.
Frank Valburg Houska (CE); Washington
Ruth Houston (M); Delavan
Charles Lewis Howard (GS); Burrton
Ezra Howard (CE); Garnett
Harold Hixson Howe (Ag); Wa Keeney
Margaret Joye Howe (GS); Manhattan
Marjorie Torrance Hubner (M); Newton
Erma Jean Huckstead (HE); Junction City
Rex Ronald Huey (RC); Louisville
Walter Henry Hukriede (GS); Cleburne
*Floyd Edgar Hull (VM); Downs
Josephine Rose Hull (HE); Downs
Leland Stanford Hulshizer (M); Manhattan
Bernice Humbert (Ar); Hutchinson
Maude Lulu Humiston (HE); Webber
Mary Melvina Hungerford (HE); Randolph
Raymond Hunsberger (GS); Mount Hope
William Alexander Hunter (GS); Manhattan
Clare Hurst (HE); Sedan
Edna LaVina Hutchinson (HE); Wamego
Ronald Vantew Hutton (EE); Manhattan
Vance Hybskmann (EE); Corning
*Carl Grant Iles (Ag); Washington, D. C.
Ethel Sadie Iles (HE); Manhattan
Everett Harold Ingersoll (Ag); Overbrook
*Irwin Ingrams (Ag); Lawrence

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FRESHMEN—*continued.*

Ralph Raymond Irwin (CE); Le Roy
Earl Harmon Jackson (Ag); Manhattan
Esther Jane Jackson (GS); Manhattan
Luevonia Jackson (HE); Lawrence
Ralph Harold Jefferson (ME); Olathe
Emma Caroline Jehlik (HE); Cuba
Harriett Agnes Jenkins (HE); Kansas City
Carl Edwin Joahonson (EE); Kansas City
Erna Vandella Johnsmeyer (HE); Manhattan
Achsa Johnson (HE); Aurora, Neb.
Bernice Lake Johnson (GS); Simpson
George Allen Johnson (CE); Simpson
Grace Zena Johnson (HE); Simpson
Jewell Murrell Johnson (AE); Hiawatha
Lillie Marie Johnson (HE); Walsburg
Milo Herbert Johnson (GS); Chanute
Reuben Milton Johnson (CE); Manhattan
William Archie Johnston (CE); Concordia
Sara Virginia Jolley (M); Manhattan
Chester Roland Jones (CE); Manhattan
George Jones (Ar); Pleasanton
George David Jones (RC); Newton
Mildred Thyra Jones (HE); Lenexa
Robert Lilbune Jones (Ag); Altamont
Zardus Jones (RC); Manhattan
Harry Ernest Jung (ME); Salina
Grace Josephine Justin (IJ); Manhattan
Erwin Samuel Kanzig (Ag); Eudora
John Clower Keas (Ag); Chanute
Leland Edward Keefer (CE); Salina
Erwin Stockton Keim (Ag); Whiting
George Kell (EE); Manhattan
Ruth Marian Kell (HE); Manhattan
Emma Marguerite Kellerstrass (HE);
Kansas City, Mo.
Frederick Leroy Kelley (ME); Ball
Fred McClearey Kelsall (Ag); Tonganoxie
Murray Vaughan Kennedy (Ar); Ottawa
Robert William Kent (Ar); Kansas City
Robert Kilpatric (EE); Manchester
James Riley Kimmel (Ag); Hiawatha
Mennell Ernest Kiser (Ag); Norton
Noel Eugene Kittell (IC); Topeka
Audria Bernice Kittle (HE); Carthage, Mo.
Walter Elroy Kline (CE); Elmdale
Ruth Carolyn Klostermeier (HE); Atchison
Frances Irene Knerr (GS); Manhattan
Roland Gabriel Knight (EE); Lenape
Winifred Ellen Knight (GS); Medicine Lodge
Kenneth Knouse (Ag); Valley Falls
Carl Louis Knowles (EE); Wellington
Olympia Ethel Kubik (HE); Caldwell
Elmer Carl Kuhlman (EE); Pratt
Venda Faith Laman HE); Osborne
Laurence Lamb (Ag); Ford
Ora Allen Lambert (Ag); Pratt
Harold Neff Lamme (CE); Whiting
Harris Collins Landon (EE);
Kansas City, Mo.
Paul Lange (RC); Salina
Roy Clinton Langford (ME); Galena
Frances Anna Langmade (HE); Oberlin
Allen Dater Lanpheer (ME);
Glenbeulah, Wis.
James Waggoner Lansing (RC); Chase
*Smith Herman Lapsley (EE); Prescott
Ralph Gerald Larson (EE); Leonardville
Raymond Allen Lasswell (ME); Manhattan
Donald Earl Lathrop (AE); La Harpe
Mary Isabel Laughbaum (HE);
Oklahoma City, Okla.
Hallie Laughlin (HE); La Crosse
Walter Layton, jr., (Ar); Salina
William Ellis Ledbetter (RC); Parsons
Harlan Adelmer Lee (RC); Fort Scott
Mary Ella Lee (HE); Lawrence
Mary Rhodes Leeper (M); Topeka
Robert Eugene Leeper (RC); Goff
Frank Eugene Lentz (Ar); Whiting
James Clayton LeValley (RC); Iola
Eunice Lyle Lewis (IJ); Silverdale
John Henry Lewis (AE); Tonganoxie
Ruth Agnes Limbocker (HE); Manhattan
Albert William Lindlar (EE); Manhattan
Hardin Isaac Linebatk (GS); Manhattan
Theodore Edward Linscheid (EE); Arlington
Fred Wallace Lipps (CE); Abilene
Henry Lewis Lobenstein (Ag);
Bonner Springs
Charles Alden Logan (EE); Eskridge
Carl Walter Londerholm (CE); Kansas City
Charles Elbert Long (GS); Hutchinson
Louis Albert Long (ME); Kansas City
Thomas Herman Long (EE); Wa Keeney
Harvey Simon Longanecker (Ag); Hope
Orville Leroy Longfellow (EE); Moline
Charles William Lovitt (FME); McCracken
Ruth Helene Lukritz (M); Downs
Harry Francis Lutz (RC); Sharon Springs
Horace Luty (CE); Kiowa
Calvin Steward Lyon (EE); Faulkner
Stewart Emerson McClave (CE); Herington
Wayne McClelland (EE); Coffeyville
Ernest Carr McCulloch (VM); Alpaugh, Cal.
Jesse Ferne McCurdy (CE); Williamsburg
Mark Raymond McDonald (GS); Plainville
Cassie McDougall (HE); Long Island
George Knox McDowell (Ag); Tucson, Ariz.
James Leroy McEachern (CE); Girard
Oliver Ward McFarlin (Ag); Princeton
*Paul Robert McGuire (CE); Castleton
Randall Birdell McIlvain (CE); Smith Center
Hazel Vivian McIntire (HE); Woodston
Ralph McKay (EE); Penalosa
John David McKean (AE); Scott City
Jesse Randolph McKee (CE); Marysville
Mark James McKeeman (Ag); Manhattan
Ross Charles McKeever (Ag); Circleville
Wayne McKibben (EE); Wichita
George John McKimens (EE); Westmoreland
Grace Carolyn McKnight (IJ);
California, Mo.
Oliver Potter McLenon (Ag); Monrovia
Donald Craig McMillin (Ag); Lamar, Colo.
Harold Hartwell McNeely (RC); Iola
Irwin Keyes McWilliams (ME); Girard
Margaret Isabell Macalpine (HE); Elmdale
Ralph Emerson Machin (EE); Russell
Lawrence Edward Maddox (EE); Hazelton
Edgar Charles Madison (EE); Spivey
Harry Leeroy Madsen (EE); Natoma
Polly Clark Mahaffy (M); Ottawa
Dean Elton Mansfield (ME); Russell
Earnest Warren Mapes (ME); Waterville
Viretta Helen Maroney (HE); Manhattan
Arling Willard Marshall (EE);
Golden City, Mo.
Lee Webster Marshall (Ag); Manhattan
Elmer Martin (Ar); Stockton
Ethel Martin (HE); Turon
Genevieve Martin (HE); Stafford
Lelia Belle Martin (HE); Stafford
Lucile Martin (RC); Clay Center
Margaret Wright Martin (IJ); Stafford
Raymond Wadsworth Martin (EE);
Parsons
*Wilson Marion Martin (Ag); Dunavant
Fred Charles Mason (CE); Lincoln
Mildred Cecelia Mast (GS); Goff
Clarence August Mathein (CE); Anthony
Lola Lorraine Matter (M); Manhattan
Ruth Lucile Mauck (HE); Langdon
Vallie Emelie Maupin (M); Topeka
Josephine Jane May (GS); Holton
Roy Hershall Mears (EE); Parsons

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FRESHMEN—*continued.*

Earl Ernest Meils (ME); South Haven
William Hozea Messenger (GS); Manhattan
David Christ Meuli (EE); Manhattan
Mildred LaVina Michener (HE); Mulvane
Jacob Emery Middlekauff (Ag); Vesper
Jean Frances Middleton (IJ); Manhattan
Avis Anna Miller (M); Halstead
Ernest Miller (ME); Coffeyville
Hazel Geraldine Miller (HE); Lincoln
John Miller (ME); Coffeyville
Leo Charles Miller (EE); Winchester
Louis Cunningham Miller (GS); Norton
Theodore Harry Miller (EE); Kansas City
Alexander Frederick Rehberg (EE); Niles
Clyde Minner (EE); Soldier
Julia Melvina Moehlman (GS); Manhattan
Martin Leonidas Monahan (EE);
Waynoka, Okla.
Harry Edward Monroe (IJ); Manhattan
Albert Edward Montgomery (EE);
Greenleaf
Arlo Roy Montgomery (CE); Greenleaf
George Montgomery, jr., (Ag); Sabetha
Annie Laurie Moore (HE); Nowata, Okla.
Florence Speer Moore (HE); Manhattan
Hubert Franklin Moore (Ag); Altoona
Mildred Moore (HE); Carthage, Mo.
Nicholas Gibbon Moore (EE);
Morrisville, N. C.
Orland Leslie Moore (GS); Booker, Tex.
William McKinley Moore (EE); Phillipsburg
Richard Allan Moorman (ME); Manhattan
Charles Edgar Moorman (GS); Manhattan
Mary Hope Morris (GS); Manhattan
Paul William Morrison (Ag); Shreveport, La.
Muriel Magdalene Moser (HE); Hiawatha
George Geweny Moses (EE); Junction City
Fred Roy Mouch (ME); Liberal
Ralph Parkinson Moyer (ME); Lyndon
Gladys Muilenburg (IJ); Palco
Iva Manilla Mullen (HE); Labette
John Norton Mullender (EE); Waldo
Laurance Reed Mulliken (GS); Manhattan
Lyle Smith Munn (GS); Norton
Cecil Madison Murphy (Ag); Talmage
Virgil Fay Murray (IJ); Nickerson
Emmert Dean Nash (Ag); Kansas City
Arlo Edwin Neal (EE); Williamsburg
Dorothy Neely (RC); Abilene
Leonard George Nehring (GS); Alma
Claude William Neibling (ME); Hiawatha
Melvin Edgar Neiswanger (EE); Osborne
Glen Henry Neitzert (EE); Miller, Mo.
Ned William Neitzert (EE); Miller, Mo.
Lucille May Newby (M); Argonia
Georgia Katharine Newcomb (GS); Garnett
Margaret Alice Newcomb (GS); Garnett
Glenara Elaine Nielson (HE); Osborne
Oline Merle Nielson (HE); Osborne
Marie Elizabeth Nissen (GS); Newton
Bernice Rae Noble (GS); Manhattan
Philip Myron Noble (CE); Manhattan
Raymond Peter Noll (EE); Wamego
LeRoy Wilson Norrie (EE); Sabetha
Edith Marie Norris (HE); White Water
Floyd Orlando Northrop (IJ);
Lawton, Okla.
Helen Frances Northrup (HE); Cuba
Onie Lindsey Norton (Ag); La Cygne
Keith Parsons Nowell (EE); Reeds, Mo.
Margaret Null (HE); Spring Hill
*Wilmer Lee Oakes (Ar); Manhattan
*John William O'Connor (CE); Leavenworth
Merle Augustus Ogden (EE); Herington
Marjorie Lois O'Neill (M); Manhattan
Roy Daniel Oplinger (VM); Jewell
Arthur O'Tolle (VM); Arnold
Esther Gladys Otto (HE); Riley
William Joseph Overton (EE);
Lees Summit, Mo.
Fay Albert Owens (EE); Arkansas City
Alice Louise Paddleford (IJ); Erie
Rosella Elizabeth Padlasek (HE); Wilson
Ethel Beth Paige (M); Manhattan
Walter Parrott (VM); Muscotah
Alta Rae Patterson (M); Erie
Ira Patterson (Ar); Ellsworth
Mary Alice Patterson (HE); Manhattan
Veora Emma Patterson (HE); Clyde
James Paul Peck (IJ); Kansas City, Mo.
William Fayne Peck (IJ) Manhattan
Irwin Leslie Peffley (CE); Manhattan
William Russell Pendleton (GS);
Manhattan
Laura Ellen Pepper (HE); Conway Springs
Wendell Woody Perham (GS); Iola
Robert Perkins (CE); Oswego
Fred Arnold Peters (GS); Columbus
Elliot Albert Peterson (GS); Randolph
Horace Reuben Pfeiffer (CE); Lorraine
Clifford Waybright Phares (EE);
Wa Keeney
Leon Gillespie Phifer (RC); Kansas City
Bernice Josephine Phippenney (GS);
Manhattan
Helen Sarah Pickens (HE); Coats
Hugh Sherlock Pickering (ME);
Junction City
Jesse Clayton Pickering (Ag); Langdon
Mark Edwin Pickering (EE);
Steele City, Neb.
Margaret Frances Pickett (HE); Galena
Myrna Elizabeth Pilley (HE);
Kansas City, Mo.
Ernestine Pinkerton (M); Clay Center
Thomas George Pizinger (ME); Hoisington
George Addison Plank (EE);
Independence, Mo.
Kenneth Harrison Platt (Ag); Manhattan
Margaret Smith Ploughe (IJ); Hutchinson
Donald McIntire Pomeroy (CE);
Westmoreland
Harold Edwin Portenier (CE); Phillipsburg
*Armer Porter (VM); Manhattan
Matilda Pospisil (HE); Wilson
Maude Blanche Powell (HE); Kansas City
Cleo Bernice Powers (HE); Herington
Josephine Bowen Powers (HE);
Junction City
Carl Clifton Prater (ME); Salina
Bruce Pratt (ME); Herington
Marion Everett Price (Ag); Oakley
Cecil Ray Prose (CE); Macksville
Carrie Elizabeth Pugh (HE); Ellis
Richard Lawrence Pycha (EE); Salina
Harry Charles Quantic (GS); Riley
Henry Patrick Quinn (VM); Manhattan
James Wilbur Radford (Ar); Mulvane
Glen Bradshaw Railsback (Ag); Langdon
*John Monroe Raisch (ME); Iola
Zenda Mable Rand (HE); Concordia
Cleo LaVon Randel (HE); Holton
Maxine Ransom (IJ); Downs
Marjorie Magdalene Raub (HE); Elmdale
Gladwin Adolph Read (VM); Manhattan
Mildred Vivian Reasoner (M); Herington
Octavia Rector (HE); Kansas City, Mo.
Adelbert Samuel Reece (GS); Manhattan
Earl Reed (RC); Jetmore
Fern Maurine Reed (HE); Sabetha

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FRESHMEN—*continued.*

Geraldine Estelle Reed (HE); Williamsburg
Glenn McKinley Reed (Ag); Galesburg
William Benedict Reed (Ar); Glasco
Virginia Louise Reeder (HE); Troy
Edwin William Reel (GS); Miltonvale
Frank Renner (RC); Rush Center
Merle Rees (RC); Hunter
Glenn Lavern Rhoades (ME); Almena
Charles Eugene Rice (Ag); Manhattan
Evelyn Curvore Richards (HE); White City
Frank Lee Richards (EE); Manhattan
Helen Richardson (RC); Manhattan
Leslie Martin Richardson (Ar); Belle Plaine
Lois Evelyn Richardson (HE); Manhattan
Glenn Riegel (Ag); Ford
Mildred Adelyne Riegel (HE); Great Bend
Helendean Riley (IJ); Wichita
Alvin Verne Ritts (GS); Topeka
Emerson Charles Robbins (EE); Fairview
Norman Losey Roberts, jr. (Ar); Manhattan
Roberta Nelle Robertson (IJ); Alma
Clarence Clayton Robinson (Ar); Wichita
Guy Erland Robinson (EE); Sharon Springs
Kenneth Robinson (RC); Manhattan
George Walter Roda (Ag); Paradise
Clayton Arney Roe (RC); Russell
Clifford LeRoy Roesener (AE); Manhattan
Melvin Custis Roessler (EE); Isabel
John Imile Rogers (Ag); Manhattan
Helen Leone Rogler (HE); Bazaar
Nicol Gosler Rogler (CE); Matfield Green
Ellison Romary (GS); Olivet
William Laurence Romick (EE); Valencia
Inga Ann Ross (HE); Amarillo, Tex.
Grace Alice Rosvall (HE); Mankato
*Morris Emory Rowe (Ag); Winfield
Charles Van Rumer (CE); Clearwater
Peri Pitts Rumold (FME); Manhattan
Harvey Alexander Russell (Ag); Scott City
Wilmer Atkinson Russell (RC); Lakin
Cecil Reed Ryan (ME); Manhattan
Hugo Oscar Saffrey (Ag); Alma
Helen Lucile Sager (HE); Clyde
Orra Salmon (HE); Manhattan
Grace Samson (HE); Topeka
Ellmore Franklin Sanders (VM); Erie
*John Brackett Sanders (Ag); Memphis, Mo.
Alfred Raymond Sargent (Ag); Manhattan
Christian William Schemm (EE); Wa Keeney
Raymond Louis Scholz (Ag); Frankfort
Solomon Simon Schott (GS); Hutchinson
Ella Louise Schrumpf (HE); Cottonwood Falls
Fred Schultz (Ag); Wathena
Leo Henry Schutte (EE); Wamego
Glen Schwandt (EE); Manhattan
Herbert Henry Schwardt (IC); Iola
Ethel Nancy Scott (HE); Burlington
Herman Scott (EE); Cedar Vale
Margaret Scott (HE); Abilene
Bernice Abberilla Seay (M); Smith Center
Georgia Martha Sedivy (M); Blue Rapids
Leon Seelig (AE); Kansas City, Mo.
Carl Ernest Seydell (CE); Manhattan
Muriel Shaver (GS); Cedar Vale
Fred John Sheel (ME); Earlton
John Encell Sheely (Ar); Bucklin
Eli Christopher Shenk (EE); Rossville
Roy Zola Sherer (VM); Mullinville
Ralph Harley Sherman (RC); Iola
Donald Angus Shields (RC); Burlington
Jennetta Frildo Shields (HE); Lost Springs
Byron Elbridge Short (IJ); Fredonia
Beth Carmen Shultice (HE); Topeka
Ernest Lee Siler (AE); Wells
Myrna Maude Smale (GS); Manhattan
Corinne Alice Smith (HE); Topeka
Edith Louise Smith (HE); Scandia
Fred Glen Smith (CE); Lyons
*John Wesley Smith (Ag); Prairie View
Lester Roosevelt Smith (VM); Manhattan
Marion Welsh Smith (ME); Manhattan
*Harry Jay Snodgrass (Ag); Gardner
Arnold Ray Snook (Ag); Ford
Lila Millicent Soren (HE); Clyde
Clara Doris Sours (HE); Manhattan
Ralph Sours (Ag); Manhattan
Ruth Margaret Southern (HE); Manhattan
Normal Flett Spear (GS); Bushong
Richard Marion Speck (Ag); Offerle
Clyde Leslie Spring (RC); Manhattan
John Irvin Stafford (Ag); Valley Falls
Loraine Martin Staley (RC); Garden City
Carl Mervil Stanley (CE); Ponca City, Okla.
Newton Stewart (CE); Vermillion
Edwin Bishop Stewart (CE); Stockton
Ruth Stewart (M); Coldwater
Velma Helen Stewart (HE); Herington
Bruce St. John, jr., (EE); Morland
Theodore Seymour St. John (EE); Rocky Ford, Colo.
Sheldon Batchelder Storer (EE); Osborne
Harold Albertus Stouffer (EE); Argonia
Randall Valentine Strader (Ar); Winfield
Thomas Martin Stratton (GS); Reading
Lawrence Hiram Strickler (Ag); Hutchinson
Faye Marie Strong (M); Manhattan
*Edward Julien Sudendorf (RC); Salina
Bertha Gertrude Summers (HE); Moscow
Grace Elizabeth Summers (HE); Beloit
Homer Louis Sumners (GS); Manhattan
Vernon Anthony Sump (ME); Randolph
Estella Cyrena Sutton (HE); Chanute
James Kenneth Swales (EE); Kansas City
Frederick Arnold Swart (GS); Riley
Floyd Raymond Swim (IC); Newton
Delos Clifton Taylor (CE); Harveyville
Evelyn Elizabeth Taylor (HE); Manhattan
James Monroe Taylor (Ar); Liberal
Jessie Howard Taylor (Ag); Keats
Harley Albert Teall (EE); El Dorado
Harvey Northrop Thackery (ME); Poplar, Mont.
Charles Hoyt Thomas (GS); Bucyrus
Esther Margaret Thomas (HE); Ogden
Harrel Peyton Thomas (GS); Bucyrus
Ben Thompson (RC); Densmore
Etta Fern Thompson (HE); Atwood
George Edwin Thompson (Ag); Hunter
Laureda Thompson (HE); Manhattan
Ward Thorson (Ag); Everest
Jobie Emerson Throckmorton (EE); Burlington
Milton Monroe Thurow (Ag); Macksville
Ralph Victor Thurow (RC); Macksville
Debbie Myrtle Timbrel (GS); Manhattan
Eva Timmons (HE); Riley
George Timmons (FME); Riley
Mary Margaret Tobias (HE); Manhattan
Kenneth Topping (RC); Overbrook
Loren Waldo Townsdin (Ag); Hugoton
Dwight Calvin Tracy (CE); Smith Center
Paul Emmitt Travis (Ag); Manhattan
George Bernard Trinder (RC); Parsons
Josephine Lee Trindle (GS); Hugoton
Mae Florence Trock (HE); Parkerville
George Edward Truby (Ag); Anthony
Ralph Leo Tweedy (GS); Iola
Harry William Uhlrig (ME); Belvue
*Royal Newton Umphres (Ag); Long Beach, Cal.

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FRESHMEN—*concluded.*

Edna Mae Unruh (HE); Haddam
George Unruh (AE); Pawnee Rock
Manuel Valdes (CE); Santiago, Chile
Vernon Moore VanAuken (RC); Manhattan
John Wesley VanDyke (EE); St. Francis
Eugene VanVranken (Ar); Pratt
Mary Ruth Vermillion (HE); Lyons
Charles Howard Vogel (CE); Newton
Harold Voiles (RC); Manhattan
John Thomas Walker (Ar); Galena
William Glenn Walton (RC); Topeka
Earl Dawson Ward (AE); Elmdale
Amelia Jane Ware (HE); Garfield
Ralph Wareham (RC); Manhattan
Joseph Ralph Waterman (CE); Florence
Emory Newton Watkins (Ag);
St. Joseph, Mo.
Hortense Lydia Watkins (M); Lyons
Ruth Karleen Watson (M); Vermillion
Raymond Howard Watson (EE);
Kansas City, Mo.
Lathrop Ames Weaver (IJ); Alma
Carroll Council Webb (EE); Augusta
Aubrey Joseph Weber (EE); Manhattan
Harry Richard Wege (EE); Great Bend
Carlos Ora Welch (ME); Topeka
Abigail Katherine Welker (HE);
Coffeyville
Royce Ovitt Wells (Ag); Plevna
Carolyn Marie Welsh (HE); Fairbury, Neb.
Robert Emmit Welsh (Ar); Manhattan
Louis Wendelburg (Ag); Stafford
Harold Jesse Werneke (AE); Caldwell
Lee Alvin West (Ag); Augusta
Lee Richard West (Ag); Sabetha
Rolland Manning White (EE); Manhattan
Walter James Whiteside (Ar); Spearville
Bruce Dean Whitney (M); Speed
Edward Warnor Wichman (EE); Eudora
Gertrude Wickers (HE); Downs
Avis Wickham (HE); Manhattan
John Mac Wiley (Ag); Burlington
Ardis Wilkinson (HE); Mount Hope
Frank Elbert Willey (EE); Marion
Archie Clay Williams (Ag);
Siloam Springs, Ark.
Chris Williams (RC); Manhattan
Horace DeLafeyette Williams (Ag); Bendena
Hugh Charles Williams (Ar); Manhattan
Juanita Marie Williams (GS); Guthrie, Okla.
Mildred Williams (HE); Wakefield
Mildred Maurine Williams (HE); Bigelow
Broder Williamson (EE); Marion
Hugh Willis (Ag); Eureka
Leo Kenneth Willis (EE); Galesburg
Henrietta Ruth Willison (GS); Dale, Ind.
Arthur Wendle Williston (RC); Manhattan
Claude Leonard Wilson (ME); Ottawa
Earl Sanford Wilson (EE); Jetmore
Loyal Venice Wimer (EE); Le Roy
Orville Winsor (EE); Lamar, Colo.
George Halbert Wishart (GS); Mankato
Buford Witten (Ag); Trenton, Mo.
Walter Wolgast (Ar); Alma
Glenn Ivan Wood (Ag); Milan
Winnifred Charlotte Wood (GS); Manhattan
Lawrence Ewalt Woodman (EE); Manhattan
William Ray Woodring (EE); Randolph
Laurence Arthur Wooley (Ag); Osborne
Adrian Morris Wright (RC); Valley Center
Henry Amos Wright (AE); Welsh, La.
Marjorie Pearl Wright (HE); Concordia
Kenneth Elwood Yandell (EE); Wilson
*Claude Newton Yaple (Ag); Rago
Harvey Yates (IJ); Dighton
Randell Gerald Yeager (Ag); Augusta
Elmer Young (VM); East St. Louis, Ill.
Henry Clay Young (GS); Leavenworth
Marguerite Jane Young (HE); Kansas City

SPECIAL STUDENTS

Margaret Ahlborn (HE); Smith Center
Nick John Albino (ME); Serbia, Serbia
Harriet Wright Allard (GS); Manhattan
Mrs. Harold Allen (GS); Manhattan
George Robert Allingham (GS); Manhattan
Helen Addalene Amos (GS); Manhattan
Elmer Eugene Archer (GS); Carlyle
William Carter Armstrong (Ag);
Wellesley, Mass
Vella Ione Aspey (IJ); Hutchinson
Mrs. C. N. Atherton (M); Manhattan
Floyd Winfield Baker (Ag); Republic
Ismail Baki (AE); Aleppo, Syria
Alta Elizabeth Barger (GS); Manhattan
Ellen Margaret Batchelor (HE); Manhattan
William Neff Batdorf (IJ); Burlington
Howard Dale Bennett (GS); Manhattan
*Glenn Dennice Beougher (Ag); Oakley
*Herbert Marion Bett (Ag); Rago
*Charles Blagg (Ag); Fort Scott
William Sheffield Blakeley (Ag); Neodesha
Clara Lillian May Boydston (GS); Holton
Chauncey Allen Brantingham (FME);
Toledo, Ohio.
Buck Britt (Ag); Wheeler, Tex.
Christine Burger (HE); Nemaha
Hartzell Burton (RC); Wichita
*Jesse Albert Byler (EE); Girard
*Aura Melvin Carkuff (Ag); Miltonvale
Henry Jens Carr (GS); Jamestown
Claude Hubert Carter (GS); Girard
Kenneth Carter (IJ); Manhattan
Grace Marie Cary (HE); Okmulgee, Okla.
Helen Edythe Cass (GS); Collyer
Myron Glenn Cassidy (GS); Manhattan
Julia Louise Caton (GS); Winfield
Hazel Bertha Cheatham (HE); Mulvane
Freda Lee Christian (GS); Kansas City
*Everett Pardon Colburn (EE); Manhattan
Harold Grant Colby (RC); Iola
*Cora May Conner (Ag); Winfield
Etta Marie Conroy (HE); Manhattan
Hazel Alma Copenhafer (GS); Manhattan
Nora Bee Corbet (HE); Leona
Paul Correa (Ag); Sao Paulo, Brazil
Judith Briggs Craig (GS); Manhattan
Charles Curtis (GS); Marion
Leslie Mitchell Davis (GS); Manhattan
Ambrose Seaton De Bard (AE);
Arkansas City.
Antonio Villaneal de la Garza (AE);
Monterey, Mexico.
Lester Drayer (ME); Manhattan
*Charles Delbert Dimmick (CE); Mulvane
Anne Margaret Diver (GS); Humboldt
Myrtle Hutto Dodge (Ag); Manhattan
*William James Douglas (Ag); Piper
Mary Edmona Dudley (GS); Lebanon
Gladys Ladd Ebert (HE); Boulder, Colo.
Ruth Elder (HE); McCune
Leonard Paul Elliott (GS); Holton
Enid Virginia Ellis (GS); Cherryvale
Muriel Ellis (GS); Cherryvale
Anna Buhler Enns (HE); Newton
Elmer Rowland Enns (GS); Inman
Jessie Josephine Erickson (HE); Manhattan
Lucile Margaret Evans (GS); Manhattan
Louise Helen Everhardy (GS); Leavenworth

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SPECIAL STUDENTS—*continued.*

Georgia Helen Fears (GS); Manhattan
Daisy Boswell Floyd (GS); Manhattan
Blanche Forrester (IJ); Manhattan
Paul Forst (GS); New York, N. Y.
Jennie Edith Francis (M); Manhattan
*Clarence Friend (Ag); Hodgenville, Ky.
Raymond Edgar Fulcher (Ag); Piper
*Hugh Shepard Funk (Ag);); Hill City
*John Clarence Gard (CE); Dwight
Raymond Floyd Gard (GS); Stafford
Roy Preston Garrett (GS); Manhattan
*Loyd Arthur Gawthrop (Ag); Murdock
Birdye May Gear (GS); Manhattan
Frances Elizabeth Godden (M); Caney
Irma Gorton (HE); Manhattan
Mary Graham (HE); Manhattan
Lola Jane Graham (GS); Wichita
*Oliver Franklin Griffen (Ag);
San Diego, Cal.
Lillian Velma Grubb (HE); Wetmore
*Harry Ludwig Gui (Ag); St. Louis, Mo.
Clinton Guy (Ag); Manhattan
Robert Alfred Gwinn (GS); Anthony
Alvin Bentley Haines (EE); Hutchinson
Joseph Robert Hall (RC); Kansas City
*Walter Sherwood Hamilton (ME);
Kansas City
Helen Mabel Hannen (M); Detroit, Mich.
*William Edward Hannigan (GS);
Milton, Mass.
Olin Wade Harner (GS); Howard
Alvareta Alice Heaton (GS); Concordia
Ernest Everett Henderson (GS); Manhattan
Mary Hertel (GS); Claflin
Caldwell Hessin (GS); Manhattan
Garold Hickok (GS); Kansas City
Olen Hindman (Ag); Wright
Eunice Tacile Hobson (M); Kingman
John Hiram Holliday (GS); Manhattan
*William Gerald Holloway (VM); Lecompton
Araminta Holman (GS); Leavenworth
James Wing Honeywell (Ag); Manhattan
James Riley Hopper (RC); Ness City
Gracia Ethel Hoyer (RC); Marysville
Archibald Hurtgen (ME); Manhattan
Rachel Augusta Jacobs (GS); Council Grove
Mildred Virginia Johnson (HE); Belleville
Wilbert Rudolph Johnson (GS); Roxbury
*George Frederick Johnston (EE); Topeka
Rudolph William Jordan (GS);
Bingham, Maine
*Chester Lee Keller (EE); Stafford
Ellis Kimble (GS); Liberal
Katherine Kimmel (M); Battle Creek, Mich.
Ann Helen Klassen (GS); Inman
Wilda Myrtle Kline (HE); Eureka
*Homer Leonard Krebs (CE); Manhattan
Amy Krieger (Ag); Manhattan
Walter Parvin Lapham (CE); Junction City
Estelle Sue Lasswell (GS); Manhattan
Mariana Lasswell (GS); Manhattan
Louis Lauritson (Ag); Kansas City
Argen Cordeiro Leite (Ag);
Sao Paulo, Brazil
John Benedict Lough (Ag); Denver, Colo.
Americo de Uirando Ludolf (Ag);
Rio de Janeiro, Brazil
Dorothy Lukert (HE); Topeka
Flotence Minette McCall (GS); Salina
Jessie Bird McCracken (GS); Manhattan
Elizabeth Jane Mabie (GS); Kansas City
*Leo Ripley Maguire (Ag); Geneseo
Pearl Mahaffey (GS); Erie
Earl Allen Manker (VM); Manhattan
Faith Martin (GS); Winfield
Martha Ruth Martin (GS); Hiawatha
*John Matthews (Ag); Delphos
Hazel Irene May (GS); Manhattan
Franz Benedict Mayer (CE); Oskaloosa
*Perry George Means (Ar); Protection
*Robert Gillilan Menefee (VM); Towanda
Ruth Merritt (GS); Vermillion, S. Dak.
Enola Miller (RC); Belleville
Edwin Moberg (VM); Worthington, Minn.
Arthur Mohrbacher (ME); Marysville
*Leo Albert Moore (EE); Hays
Walker Neil Moore (GS); Phillipsburg
Fred Theodore Muench (RC); Abilene
Ray Murrell (VM); Junction City
Frank Lewis Myers (BS); Manhattan
*Carl Otto Nelson (Ag); Agenda
Robert Marcus Nesbit (M); Mound City
Anna Mae Nettrouer (GS); Lost Springs
Irma Nevins (GS); Dodge City
*George Thomas Nicholson (CE);
Hutchinson
Helen Grosvenor Norton (GS); Chanute
Ada Dodge Pearce (GS); Ardmore, Okla.
Ethel Dell Peppiatt (GS); Ellsworth
Ruth Perkins (GS); Oswego
*John Newton Hagan Phlegar (Ag); Russell
John Loran Porter (Ag); Quinter
*Quincy Daniel Powdrill (Ag); Taft, Okla.
*Russell Meredith Prescott (EE); Manhattan
Clarence Osborn Price (GS); Manhattan
Carl Pycha (EE); Salina
Alice Dresser Rader (GS); Manhattan
John Lyndon Rader (GS); Caney
Ruth Rachael Rannells (GS); Manhattan
Guilherme Renaux (Ag); Catharina, Brazil
Ralph Burton Ricklefs (Ag); Troy
John Calvin Riddell (GS); Salina
Margaret Fern Riley (M); Topeka
Frank Leslie Roark (GS); Manhattan
Josephine Coblentz Rogler (GS);
Cottonwood Falls
Mabel Catherine Russell (GS); Lyons
Mary Dillon Russell (GS); Lakin
Morton Rust (GS); Downs
Max Ryan (GS); Leavenworth
Sophia Hall Ryland (GS); Manhattan
Clayton Radford Sauer (Ag); Bendena
Jim Fred Savage (VM); Spearville
Susanna Schnemayer (HE); Topeka
Lena Pauline Schulthess (GS); Horton
Helen Irma Shellhaas (GS); Abilene
Charles Emmett Sherer (Ag); Mullinville
*Harold Simpson (EE); Manhattan
Nathan James Simpson (ME); Agra
Harold Ernest Smith (GS); Stafford
Helen Irene Smith (GS); Salina
Lucile Evelyn Smith (GS); Topeka
Robert Burns Smith (Ag); Raton, N. Mex.
Annie Henderson Spence (HE); McPherson
Gertrude Frances Srack (HE); Manhattan
James Lowell Stephenson (GS); Downs
Faye Ina Stice (GS); Alta Vista
Jeanette Bernice Stitt (HE); Neodesha
Verne Martin Stromme (Ag); Le Roy
Robert Goodrich Strong (GS); Wichita
Emma Stutz (GS); Manhattan
Mary Mercedes Sullivan (GS); Fort Scott
Milan Burdette Swartz (IJ); Hiawatha
Stanley Carl Swenson (IJ); Manhattan
Helen George Swope (GS); Manhattan
Lasca Ilene Thomas (GS); Le Roy
Dessie Thornburg (HE); Manhattan
*Chester Tolle (Ag); Manhattan
William Van Allstyne (VM); Manhattan

* Under auspices of the United States Veterans' Bureau.

SPECIAL STUDENTS—*concluded.*

Ferdinand Voiland (GS); Topeka
Gretchen Voiland (HE); Topeka
May Irene Wampler (HE); Manhattan
Gilmore Wann (GS); Hays
Harry Kneeland Wareham (GS); Manhattan
Nannie Agnes Wesley (GS); Bancroft
Garnett Westbrook (GS); Manhattan
Grace Marie Weyer (GS); Centralia
Frances Beatrice White (HE); Castleton
*Clyde Francis Whitson (VM); Udall
Vera Wichers (HE); Manhattan
Pearl Opal Wightman (GS); Plevna
Robert Trisch Willkie (Ag); Elwood, Ind.
Ruth Mable Witwer (IJ); Topeka
Laurence Wood (GS); Clay Center
*Joseph Guy Woods (Ag); Holden, Mo.

SUMMER SCHOOL

Edith Dorothy Abbott; Manhattan
Hazel Dell Adams; Oil Hill
Henry Joseph Adams; Cimarron
Kathryn Ruth Adams; Topeka
*James F. Adee; Manhattan
*William Arthur Agee; Raymondville, Mo.
*Erwin Aikins; Manhattan
Cora Barbara Akers; Windom
Bernice Jewell Allen; Mountain Grove, Mo.
Harriett Jane Allen; Leavenworth
Joseph Levi Allen; Manhattan
Raiffe Cobb Alvord; Manhattan
Anne Susie Amstutz; Halstead
Lucille Eugenia Anderson; Lindsborg
Nelson Henry Anderson; Neosho Falls
Esther Etta Andrews; Manhattan
Carol Esther Ankeny; Manhattan
Leah Ellen Arnold; Manhattan
Leola Elnore Ash; Cullison
*Roscoe William Aspley; Abilene
*Chester Gladstone Aument; Lancaster, Pa.
*Elmer Rex Ausemus; Manhattan
*William S. Austin; Manhattan
*Andrew Ansel Axline; Pratt
*John Thomas Azbell; Fredericktown, Mo.
Roscoe Symmes Bahret; Circleville
Glenn Bernard Bailey; Pratt
Henry Raymond Baker; Manhattan
*Marvel L. Baker; Syracuse
Walter Buswell Balch; Lansdowne, Pa.
*Everett Westley Baldwin; Topaz, Mo.
Ethel Loleta Bales; Manhattan
*Edgar Lee Ball; Parsons
Edna Florence Bangs; Madison
Paul Willis Barber; Dorrance
Ida May Bare; Protection
Nellie Mabel Bare; Protection
Marion Elizabeth Barkyoumb; Olsburg
Orval Franklin Barnard; Farmington
Beulah Belle Barnes; Blue Mound
*Philip Asa Barnes; Blue Mound
Edna Barr; Manhattan
Sadie Barr; Manhattan
Neva Neola Barrows; Manhattan
*Guy Charles Bartgis; Cedar Vale
Fern Twyla Bastom; Haddam
Ellen Margaret Batchelor; Manhattan
Harold Winthrop Batchelor; Manhattan
*Isaiah Israel Baughman; Brandsville, Mo.
Burton Bernard Bayles; Manhattan
Fanny Belle Beggs; Washington
Alta Elnora Bellman; Blackwell, Okla.
Dudley Francis Bentley; Sterling
*Glen Dennice Beougher; Manhattan
Marjorie Marie Berger; Sylvan Grove
Anna Lillian Best; Manhattan
*Adolph Louis Betz; Alton, Ill.
*Nathan Ricker Bickford; Bartlett
Ada Grace Billings; Manhattan
Lucia M. Blitz; Manhattan
Mrs. Floyd A. Bleger; Manhattan
*Floyd Arther Bleger; Saxman
Elna Elizabeth Blom; Chapman
Willis Maude Blunk; Galena
Elmer Fredrick Bock; Cawker City
*Benjamin Robert Bockhaus; Manhattan
Clarence Edwin Bohnenblust; Leonardville
*Walter Christ Boller; Sedgwick
Orville Thomas Bonnett; Alton
Fred Sawtelle Boone; Manhattan
John Harrison Borror; Westphalia
Carl William Bower; Manhattan
*John Edward Boyle; Harlan, Neb.
Ada Pearl Bradley; Manhattan
*Robert Bradshaw; Bowling Rock, N. C.
Verna Breese; Wichita
*Arthur Hayes Brewer; Manhattan
Curtis Angle Brewer; Manhattan
Ruth Nelle Briggs; Wichita
Amelia Blanche Brooks; Manhattan
Awilda Brown; Winfield
*Charles Lincoln Brown; Holton
*Guy Brown; Bellaire
Joseph Oscar Brown; Dodge City
Meredith O. Brown; Greensburg
Nina Myrtle Browning; Manhattan
Esther Brownrigg; Mont Ida
Albert J. Brubaker; Ellsworth
Neal Dwight Bruce; Marquette
Lewis Jay Bryan; Manhattan
*Joseph Daniel Buchman; Council Grove
William John Bucklee; Manhattan
Leslie Burger; Seneca
William Harold Burgwin; Manhattan
Earl F. Burk; Manhattan
Bernard Charles Burns; Manhattan
Osceola Hall Burr; Manhattan
*Lennie Irwin Burris; McCune
Mary Penelope Burtis; Manhattan
Hartzell Burton; Wichita
Alberta Belle Bush; Little River
George Hoffman Bush; Little River
Georgiana Bush; Little River
Dwight C. Bushey; Muscotah
Guenn Ernstine Byarlay; Manhattan
*Jesse Albert Byler; Girard
*Constantine Diamandis Calogeris; Manhattan
*Matthew John Calto; Columbus, Neb.
Alice Barbara Campbell; Mulvane
*John J. Campbell; Campbell, Mo.
Samuel David Capper; Ames
Florence M. Carey; Manhattan
Walter Bryan Carey; Hutchinson
Opal Carl; Goodland
*Arvid O. Carlson; Overbrook
*Doyle Henry Carter; Trenton, Mo.
Ivy Hildreth Case; Alta Vista
*Sylvester Ulric Case; Lyons
*Edward H. Casinger; Manhattan
Myron Glenn Cassidy; Manhattan
*Herbert Melvin Chapin; McPherson
James T. Cheng; Manhattan
Etta Estella Chillson; Manhattan
William David Christman; Wichita
Ercile Laveta Clark; Hutchinson
Iva Bernice Clark; Hutchinson
Lewis Arden Clark; Valley Center
Charles Robert Clothier; Manhattan
*Joe T. Cobb; Manhattan
Fred Cocherell; Manhattan
Inez Alice Coleman; Manhattan

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SUMMER SCHOOL—*continued.*

Myrtle Irene Coleman; Centralia
Nellie Jane Coleman; Manhattan
John Alfred Collier; Luray
Arthur Bright Collom; Manhattan
Evelyn M. Colwell; Manhattan
Louis James Combs; Burden
Mary Alice Cook; Manhattan
Commodore F. Cool; Manhattan
V. Vincent Cool; Manhattan
Helen Lucille Cooper; Manhattan
Elsie Leigh Cope; Irving
*Metheny John Copeland; Quinter
Hazel Alma Copenhafer; Manhattan
Marceline Willard Couture; Topeka
Warren C. Cowell; Clay Center
Judith Briggs Craig; Manhattan
Georgia Belle Crihfield; Manhattan
Ruby Lee Crocker; Matfield Green
Claude B. Cross; Manhattan
Annie Georgiana Crouch; Manhattan
Rolland Miller Crow; Kansas City
*William Burbank Crowther; Philadelphia, Pa.
John Daniel Cunningham; Manhattan
Purl Hughie Cunningham; Girard
Rose Matilda Cunningham; Manhattan
Ruth Lois Cunningham; Manhattan
*James J. Curley; Manhattan
John T. Curtis; Ogden
*Guiseppe Cutitta; Kansas City, Mo.
*Charles Otto Dailey; Garden City
*Elton Merion Dailey; Garden City
Earl Gilbert Darby; Manhattan
Harry Linsday Davidson; Manhattan
David Everett Davis; Manhattan
*Edgar William Davis; Lyons
Josephine I. Davis; Morganville
Leslie Mitchell Davis; Kansas City, Mo.
Mary Frances Davis; Bronson
*Thomas Townsend Davis; Manhattan
Antonio Villarreal de la Garza; Monterey, Mexico.
Dorsie Lawrence Deniston; Manhattan
Elsie May Dent; Manhattan
H. Robert De Rose; Manhattan
Dorothy May De Wolf; Garnett
Mildred Atta Dial; Caldwell
Elizabeth Dickens; Manhattan
Curtis William Dickson; Manhattan
Marion George Dickson; Manhattan
Marie Louise Diedrichs; Washington
*Clyde Charles Dilley; Beattie
*John Alden Dimmitt; Brookville
*Charles Orville Dirks; Wichita
Harriet Mae Divine; Kansas City
*John Francis Doane; Topeka
Fred H. Dodge; Manhattan
*George Washington Dowell; Springfield, Mo.
Irene Dora Drake; Wichita
Myrtle Sadie Dubbs; Ransom
*Roy Oren Dundon; Junction City
*Frank Alexander Dunlap; Sterling
Helen Vare Dunlap; Eureka
*William Ray Dunn; Neck, Mo.
Hazel Viola Dyer; Oberlin
*Lee Noble Eastlick; Havelock, Neb.
*Sidney Eberhart; Topeka
George Graham Edgerton; Canton
Mildred C. Edwards; Athol
Winfred Maude Edwards; Athol
*Clark T. Eimer; Manhattan
*Olaf Victor Eklund; Manhattan
John Burton Elliott; Manhattan
Bertha Claire Ellsworth; Manhattan
Frederick Earl Emery; Manhattan
Victor John Englund; Falun
Charles Ranger Enlow; Manhattan
Anna Roxanna Erikson; Junction City
Mary Rebecca Esdon; Manhattan
Robert Alexander Esdon; Manhattan
*Thomas Duncan Eshelman; Springfield, Mo.
Darrel Lee Evans; Manhattan
Jessie Belle Evans; Topeka
*Joseph Everett; Marston, Mo.
*George Earl Faidley; Wakefield
Kitty Faulconer; Manhattan
Esther Fayman; Manhattan
Ethel B. Feese; Manhattan
Crete Spencer Fielding; Manhattan
*Daniel Figgs; Manhattan
Howard Daniel Finch; White Water
Marjorie Fisher; Manhattan
*Charles Raymond Fitch; Miltonvale
Agnes Eloise Flanders; Westboro, Mo.
Beatty Hope Fleenor; Manhattan
*Robert Clarence Fleming; Manhattan
Alma Frances Flentie; Centralia
Anna Mae Fletcher; Manhattan
Vernett Edward Fletcher; Manhattan
Hortense Rosalie Flower; Kansas City
Daisy Boswell Floyd; Manhattan
Asa Herbert Ford; Seneca
Blanche Forrester; Manhattan
Nellie S. Forrester; Hutchinson
Robert Miles Forrester; Manhattan
*Thomas James Fowler; Manhattan
*Charles Lincoln Foxworthy; Mountain Grove, Mo.
*Samuel Robert Frederick; Kennett, Mo.
John Elder Freeland; Marion
Edwin J. Frick; Manhattan
*Clarence Friend; Hodgenville, Ky.
Mary Woolfolk Frye; Kansas City
Elton Milbert Gard; Stafford
*John Clarence Gard; Manhattan
Ruth Emma Gardenhire; Alma
Oscar Deane Gardner; Louisburg
Roy Preston Garrett; Manhattan
Charles Lionel Gastineau; Parsons
Freda Geffert; Greenleaf
*Jessie Conrade Geiger; Wichita
George Albert Gemmell; Manhattan
Clarence Raymond George; Manhattan
Ople Ruth Gibbs; Parsons
Samuel James Gilbert; Arkansas City
Mary Webber Gile; Concordia
James Harry Gillespie; Anthony
Hiram Stanley Gish; Manhattan
John Arthur Glaze; Manhattan
Adella Elizabeth Glenn; Manhattan
Marie Sarah Glenn; Manhattan
Annie Lucile Gnagey; Fruita, Colo.
Mabel Godsey; Emporia
*Clarence Raymond Gottschall; Manhattan
Coryell Gove; Junction City
Mary Graham; Manhattan
*Oliver O. Grant; Pomona, Mo.
*Reed Crawmer Greer; Kansas City, Mo.
*Richard B. Griffenhagen; Colorado Springs, Colo.
Evan Lawrence Griffith; Manhattan
Gladys Cansada Gritz; Fall River
Edith Gabriella Grundmeier; Manhattan
Lola Leeontine Gudge; Wichita
*Harry Ludwig Gui; St. Louis, Mo.
Joseph Cunningham Gulledge; Stafford
Charles Francis Hadley; Manhattan
Bernice Aileen Hainey; Olsburg
Birdia Annalee Haller; Hutchinson
George Edward Hamilton; Blue Mound
Robert Leslie Hamilton; Manhattan
Lois Margaret Hanna; Clay Center
Gladys Vera Harding; Lecompton

* Under auspices of the United States Veterans' Bureau.

SUMMER SCHOOL—*continued.*

*Harold Ortin Harding; Lawrence
Claude B. Harris; Havensville
*Lloyd Ellsworth Harris;
Beaver Crossing, Neb.
Mary Lucelia Harris; Manhattan
*Roy Charles Harrison; Satanta
Stella Maude Harriss; Manhattan
Earl Raymond Harrouff; Emporia
Dick Michael Hartigan; Fairbury, Neb.
*Hugh E. Hartman; Manhattan
Carl Bernard Hasenyager; Bern
*Vertner Hastings; Manhattan
Clarence Raymond Hatfield; Wichita
Ada Haukenberry; Manhattan
Margaret Hawke; Manhattan
Irene Hays; Manhattan
Delpha M. Hazeltine; Wetmore
William F. Hearst; Alma
Philip Heartburg; Manhattan
*Raymond Heaton; Manhattan
Ellen Mathilda Hedstrom; Manhattan
Loren Bryce Hefling; Manhattan
Hazel Ethel Heiens; Abilene
Teresa Cecelia Helget; Manhattan
Nina A. Heller; Lincoln
*Clyde Russell Hemphill; Chanute
Sue V. Hemphill; Clay Center
*George Elwin Hendrix; Lane
Ella Evangeline Henning; Smith Center
Joseph Regnald Henning; Smith Center
*Jesse James Hennon; Sterling
*Emra Adam Hepler; Manhattan
Ethan Allen Herr; Manhattan
Grace Herr; Medicine Lodge
Julian Herrera; Mexico City, Mexico
Chester Albern Herrick; Colony
Donald Myron Herrick; Hutchinson
Josephine Herrman; Hilland, S. Dak.
Margaret Kathryn Heshion; Downs
Caldwell V. Hessin; Manhattan
Lyman Ray Hiatt; Topeka
*Marion George Hiatt; Horton
Flora Marie Hill; Manhattan
Mabel Doerr Hill; Barnes
Charles Nelson Hillix; Parsons
*Charley McKinley Hindman; Coffeyville
*Harley James Hixson; Deering
*Milton Louis Hoefle; Highland, Ill.
*Frank Hogan; Simmons, Mo.
Edna Letha Hoke; Manhattan
*William Calhoun Holder; Pleasant Hill, Mo.
Ola May Holland; Geuda Springs.
*William Gerald Holloway; Lecompton
George Neeley Holmes; Manhattan
Earl Robert Honeywell; Manhattan
*Earl Fremont Hoover; Manhattan
*Harold Dunbar Hopkins; Udall
Elmer Hopp; Manhattan
*Richard Hopper; Manhattan
Walter Rawlins Horlacher; Colby
*Homer Allen Horn; Manhattan
*Robert Horton; Weingarten, Mo.
Margaret Hotchkiss; Burlingame
*Rubin Nicholas Houston; Charleston, Mo.
Anna Howard; Clyde
Sherman H. Howard; Chapman
Hazel Dell Howe; Manhattan
*Henry William Hoyer; Marysville
Esther Alden Huling; Manhattan
*Floyd Edgar Hull; Downs
Geraldine Hull; Manhattan
Maude Lulu Humiston; Webber
*George F. Humphrey; Manhattan
*Frederick Otterbine Humrich; Gaylord
May Agnes Hunter; Rock Creek
William Alexander Hunter; Manhattan
*Christopher Columbus Huntley; Manhattan
Ralph Josiah Hutchman; Pittsburg
Ronald Vantew Hutton; Manhattan
Fred A. Irwin; Manhattan
Axel E. Isaacson; Wilson
Earl Harmon Jackson; Manhattan
Esther Jane Jackson; Manhattan
Mattie Christine Jackson; Kansas City
*Peter F. Jacobsen; Moville, Iowa
Harry Raymond James; Manhattan
Mary James; Madison
Romon Q. Javier; Cadiz, P. I.
*Fred Talbot Jenkins; Winfield
*Harry C. Jennings; Manhattan
Florence Gertrude Jewell; Goodland
Lea Nathan Jewett; Burlington
Anna May Johnson; Manhattan
*Carl Edward Johnson; Sharon Springs
Erma Leota Johnson; Winfield
Ernest B. Johnson; Manhattan
Grace Darling Johnson; Manhattan
Lena Leoti Johnson; Manhattan
Lulu Johnson; Manhattan
Mamie B. Johnson; Manhattan
Elsie Mae Johnston; Haddam
*George Frederick Johnston; Topeka
Nellie B. Johnston; Haddam
Frances Allegra Johnstone; Manhattan
Clifford Charles Jolley; Manhattan
Eva Pearle Jones; Goff
Henrietta Antinette Jones; Manhattan
Simon William Jones; Hanover
Herbert Wilson Jordan; Seneca
Mohammed Kamal; Cairo, Egypt
Lillian Kammeyer; Manhattan
Walter August Karlowski; Manhattan
Cline Edward Kauer; Courtland
Ernest Baker Keith; Manhattan
*Chester Lee Keller; Stafford
*Henry Vernon Keller; Manhattan
Theodore Willard Keller; Manhattan
Gladys Mildred Kemp; Manhattan
Marion Kendall; Manhattan
John A. W. Kennedy; Manhattan
*Oscar Dunber Kerr; Windsor, Mo.
*Roy Dewey Kersey; Eskridge
Jessie Keyes; Manhattan
*Russell Stanley Kifer; Springfield, Mo.
Gladys Ruth Kimmal; Athol
Helen Elise King; Manhattan
Julia King; Manhattan
Kathryn Elizabeth King; Manhattan
Marion Malcolm King; Manhattan
Opal T. King; Grant City, Mo.
Lucy M. Kinsey; Montrose
*Bertie Ray Kirkpatrick; Paradise
*Arthur Louis Klein; San Marcial, N. Mex.
*Fred Kling; Scott City
Eva Maude Klingensmith; Louisville
Regina Verne Klingensmith; Louisville
Frances Irene Knerr; Manhattan
*Peter Knight; Manhattan
Raymond Scott Knox; Jetmore
*Alexander R. Koehn; McPherson
*Loyd Joseph Kostelecky; Milford
*Homer Leonard Krebs; Manhattan
Snoda Grace Krider; Cassoday
Victoria B. Krumsick; Paola
Susie Margaret Kyle; Abilene
Maurice Dee Laine; Manhattan
Charlotte Crouch Lamprecht; Manhattan
*Henry C. Lane; Manhattan
Burton Reap Langdon; Manhattan
Helen Pauline Larson; Manhattan
Alice Josephine Lathrop; Osborne
Wing Kei Lau; Canton, China
Eugenia Cora Lauck; Olsburg

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SUMMER SCHOOL—*continued.*

Velma Mary Lawrence; Manhattan
*John Atwil Leach; Xenia, Ohio
Lysle Douglas Leach; Winfield
*Aubrey McDaniel Lee; Manhattan
LeRoy Markle Leiter; Protection
*John Clyde Lentz; Holton
Ruth Evangeline Leonard; Manhattan
Dale B. Levi; Manhattan
*Edgar L. Lindley; Wichita
Ching Sheng Lo; Canton, China
Will David Lobaugh; Greenleaf
Russell Newton Loomis; Manhattan
Geta Lund; Manhattan
Kai Lum Lung; Canton, China
Daniel Gail Lynch; Manhattan
Hazel Alma Lyness; Walnut
Winfred Owen McCarty; Ames
Ethel Leanor Manwarren McClure; Manhattan
*Roy Dewey McClure; Manhattan
Donald Ashley McConnell; Goff
Grace Kerns McCoppin; Phillipsburg
Jerry D. McCord; Topeka
Dewey Zollie McCormick; Manhattan
Frederick McCloy McElhinney; Manhattan
Ralph R. McFadden; Manhattan
Blanche McFall; Manhattan
*Howard Hutcheson McGee; Olathe
Harold Joseph McGinley; Manhattan
Jaunita Faye McHenry; Manhattan
Pearle Irene McHenry; Paola.
Thomas Wood McIntosh; Manhattan
*James Claude McKay; Kennett, Mo.
*William Henry McKee; Cedar Vale
Harold T. McKeever; Circleville
*Minno Smith McKenney; Valley Falls
*Henry Mearle McKinney; Horton
James A. McKitterick; Manhattan
Jay Wilbur McManis; Kansas City
Burnette McMichael; Lincoln
Katharine Cardwell McQuillen; Clay Center
Robert Rhoades McVicar; Wichita
*Earl J. McWilliams; Alta Vista
David Leslie Mackintosh; Manhattan
*Wilbur Samuel Magill; Topeka
Elva Ione Mall; Manhattan
*William Henry Malone; Fort Scott
Louise Helen Mangelsdorf; Atchison
Alice Manley; Cheney
Thornton Jason Manry; Manhattan
Mary Ellen Maroney; Manhattan
Daniel Claire Marshall; Manhattan
Ray Eugene Marshall; Manhattan
Carlton Beeler Martin; Manhattan
Isaac V. Martin; Pawnee Rock
Raymond Wadsworth Martin; Parsons
*Wilson Marion Martin; Dunavant
*Jesse Thomas Masterson; Kennett, Mo.
Clarence August Mathein; Anthony
Hilery E. Mather; Manhattan
Glenn G. Maurer; Attica
Hobart Irwin May; Manhattan
Colletta A. Mayden; Manhattan
*Perry George Means; Manhattan
*Fred William Meisner; Cole Camp, Mo.
*Henry I. Melcher; Concordia.
*Frank Lawrence Melville; Philadelphia, Pa.
*Edward Winebright Merrill; Le Roy
Virginia Messenger; Manhattan
Albert Metz; Anthony
Mary Louise Meuser; Paola
Clifford Graham Mickel; Soldier
Hazel Frazier Mickel; Soldier
*Oliver Harrison Mickey; Wichita
Jean Frances Middleton; Manhattan
Jose Angel Mier; Aguascalientes, Mexico.
Susan Esther Millier; Tarkio, Mo.
*Elsha Paul Milton; Larned
Leon Francis Montague; Irving
Halford Ernest Moody; Riley
Burnece Moore; Cleburne
Jean Moore; Nowata, Okla.
Victor Rhodes Moore; Parsons
*Clinton Hawthorne Morgan; Manhattan
Ernest Kay Morgan; Manhattan
*Alva B. Morris; Manhattan
Katherine Dyllys Morris; Manhattan
Mary Hope Morris; Manhattan
Johannes Frederick Theobald Mostert; Balfour, South Africa.
Merle E. Muchmore; Winfield
Elsie Leola Mulkey; Smith Center
Bertha Murphy; Manhattan
John Wallace Murphy; Manhattan
Mabel Ardis Murphy; Nickerson
John Kenneth Muse; Manhattan
Marianne H. Muse; Manhattan
*Harry Albert Myers; Americus
Telie Edward Nafziger; McPherson
Vincent Werner Nass; Atchison
Arria French Neal; Clay Center
Olga Floretta Neef; Manhattan
*Carl Otto Nelson; Agenda
Harry Nelson; Bennington
*Robert Newman; Cassidy, Mo.
*George Thomas Nicholson; Hutchinson
*Joseph Henry Noening; Willow Springs, Mo.
Edith Berenice Nonken; Manhattan
George Verne Norris; Manhattan
Anna R. Oberhelman; Leonardville
Lillian Louise Oberhelman; Leonardville
*John William O'Connor; Leavenworth
Elsie Mae Oliver; Manhattan
Floyd Robert Oliver; Neodesha
Hazel Lucille Olson; Topeka
*Earl David Ormsbee; Smith Center
Ruby Elizabeth Orth; Manhattan
Reeves Ayers Osborne; Burrton
*Charles Calvin Osburn; Neodesha
Margery Mariam Ostrander; Clifton
Winifred Edith Paddock; Manhattan
Alfred Robb Paden; Manhattan
Grace Parham; Cheney
*Fred Parrish; Manhattan
*Clement Phares Parsell; Manhattan
Agnes Ellen Pasley; Mayetta
Agnes Patterson; Manhattan
*Fred Harold Paulsen; Stafford
Ella Mae Paustian; Junction City
Amos Oliver Payne; Manhattan
James Ernest Payne; Manhattan
Margaret Elizabeth Payne; Fontana
Ona Vivian Peak; Manhattan
Zenia Pearson; Manhattan
Zurlinden Lafayette Pearson; Manhattan
*Royce Owen Pence; Colby
Ellen La Verne Pennel; Oregon, Mo.
*Fred Peoples; Elgin
Florence Nell Peppiatt; Hecla, Wyo.
Edward John Perkins; Rosedale
Orin Ross Peterson; Caney
Nettie Josephine Pfaff; Beloit
William A. E. Pfaff; Fort Scott
*John Newton Hagan Phleger; Russell
*Samuel Pickard; Manhattan
Don Homer Pickrell; Leon
Mariam Alverta Pierce; Riley
Martha S. Pittman; Manhattan
Howard Frederick Plamann; Manhattan
Opal LaShelle Plamann; Manhattan
Eva Mildred Platt; Manhattan
Kenneth Harrison Platt; Manhattan
Matilda Opal Plunkett; Minneapolis
Sybil Porter; Fredonia

* Under auspices of the United States Veterans' Bureau.

SUMMER SCHOOL—*continued.*

Charles Wallace Pratt; Frankfort
James Wilson Pratt; Manhattan
*Russell Meredith Prescott; Parkersville
James Francis Price; Manhattan
*Lewis Elmore Proctor; Caruthersville, Mo.
James Wendell Pryor; Kansas City
Elsie Inez Puckey; Clay Center
Carrie Elizabeth Pugh; Ellis
Mabel A. Purdy; Manhattan
Charles Arthur Pyle; Manhattan
*Henry Patrick Quinn; Manhattan
Jerry Thomas Quinn; Manhattan
Karl Spangler Quisenberry; Newton
Alice Dresser Rader; Manhattan
Arthur C. Ramsey; Partridge
Cortes Gilbert Randell; Marysville
Sophia Duncan Rankin; Manhattan
*Alfred Lee Rapp; Manhattan
Leonard Arthur Rapp; Athol
Mary McMillan Rasmussen; Cleburne
*Vernus Esko Ray; Manhattan
Adelbert Samuel Reece; Manhattan
Louise Eilene Reed; Ottawa
Oliver Reed; Manhattan
John Walter Reel; Manhattan
Wray R. Reeves; Fort Scott
Grace Lowena Reitzel; Waterville
Lawrence Otto Reynolds; Pierce City, Mo.
Fred A. Rhine; Cleburne
Harold C. Rhine; Cleburne
Mabel O. Rhine; Cleburne
Ada Dorothy Rice; Manhattan
Charles Eugene Rice; Manhattan
Charlotte Mae Richards; Manhattan
John William Richards; Manhattan
Pauline M. Richards; Delphos
*John H. Richardson; Mountain Grove, Mo.
*Francis Flavian Rieger; Bonner Springs
Estelle Riffel; Stockton
Arthur Howard Riley; Manhattan
Durward Bellmont Rising; Salina
Gladys Irene Ritts; Topeka
Frank Barton Robb; Scott City
Bertha Wright Roberts; Holton
Carson Basil Roberts; Manhattan
James Thomas Roberts; Manhattan
*Charles Lee Robinson; Downs
Howard Hardy Robinson; Washington
Anna Marie Roenigk; Santa Paula, Cal.
*Charles Thomas Rogers; Butler, Mo.
Lydia Eugenia Rogers; Manhattan
Mae Rogers; Manhattan
Walter John Rogers; Quinter
*William Jacob Rommelfanger; Greeley
*Claude Parke Rose; Fort Scott
Irwin Thomas Rothrock; Springdale, Ark.
*Arthur LeRoy Russell; Peabody
Edna Blanche Russell; Manhattan
*Francis Herbert Russell; Opolis
Laura Faye Russell; Manhattan
Orpha Eilleen Russell; Manhattan
Ralph William Russell; Mankato
Cecil Reed Ryan; Manhattan
*Frank Lester Ryman; Independence
Grace Elvena Sachau; Manhattan
Samuel Cecil Salmon; Manhattan
*John Brackett Sanders; Memphis, Mo.
Christine Saunders; Manhattan
Verona Octavia Schact; Frankfort
*Christian Michael Schlicher; Vassar
Abraham Burton Schmidt; Canton
Henry William Schmitz; Alma
Helen Schneider; Manhattan
*John Carl Schultz; Hormick, Iowa
Eugene Saxton Scott; Burlington
Lee Ashton Scott; Westphalia
Mildred Grace Scott; Jamesport, Mo.
Robert Graham Scott; Kansas City, Mo.
Ruth Emilie Scott; Kirwin
Viola Alice Scritchfield; Manhattan
*Isaac Wesley Seamands; Joplin, Mo.
*Edward Shaffer; Minneola
Warren R. Sheff; Haven
Jessie May Sherrod; Goodland
Bessie Viola Shiner; Manhattan
David Loyd Signor; Manhattan
*Aaron Lloyd Simpson; Illmo, Mo.
Carl Franklin Simpson; Tulsa, Okla.
*Harold L. Simpson; Clay Center
*R. M. Sisk; Caruthersville, Mo.
Hazel Skidmore; Osage City
*Joseph William Skinner; La Harpe
Blanche Eudora Skipton; Narka
Lois Atlanta Slater; Glasco
*George Taylor Smart; Cottontown, Tenn.
Grace K. Smith; Le Roy
*John Wesley Smith; Manhattan
Linus B. Smith; Hutchinson
Opal Ellen Smith; Manhattan
Rollin James Smith; Topeka
*Harry Jay Snodgrass; Gardner
*William Snyder; Manhattan
Labib Boutros Solimon; Sindibees, Egypt
Eunice Marie Spangler; Sharon
Iva Spangler; Sharon
Estelle Louise Sparman; Green
Annie Henderson Spence; McPherson
Loyd Ancel Spindler; Garnett
Harry Jack Staib; Turon
*Jesse Gaylord Stanton; Wa Keeney
Jay Ralph Starkey; Manhattan
Florence Stauffer; Marion
Marion M. Stauffer; Marion
Mildred Sterling; Clay Center
Evan Watson Stevens; Spearville
Leland Sterling Stevens; Spearville
James Scott Stewart; Coldwater
Lillian Colene Stewart; Watson, Mo.
Warren Roy Stewart; Manhattan
*Clyde E. Stout; Manhattan
Hamilton Stout; Hill City
*John Fred Strimple; Eureka
*Richard Raymond Stucky; Moundridge
*Ralph Stumbaugh; Marsh Creek, Mo.
*Ernest L. Suddarth; Manhattan
*Roberts Burns Swan; Wayside
Esther Hanzina Swanson; Manhattan
Mabel M. Swanson; Manhattan
*Frank Swarner; Hartford
Hazel Marie Sweet; Manhattan
Stanley C. Swenson; Manhattan
Harry Alcid Swim; Manhattan
Gladys Eola Swinton; Victor
Maude Velna Tague; Hutchinson
Mary Fidelia Taylor; Newton
Paul A. Tharp; Winfield
Donald Cheney Thayer; Manhattan
Lora F. Thiele; Hanover
Lasca Ilene Thomas; Topeka
Lawrence Clifford Thomas; Clay Center
Ora Earl Thomas; Manhattan
Lola B. Thompson; Geneseo
Josephine May Thorn; Beattie
Meryl Ethyln Thornburg; Manhattan
*Virgil Perry Timson; Quasqueton, Iowa
*William Howard Tinker; Windsor, Mo.
*Chester D. Tolle; Manhattan
Helen May Toothaker; Riley
*Frank Raymond Townsend; Madison
Clemence Opal Travis; Victor
Jacob E. Trieschmann; Ellsworth
*Floyd J. Tucker; Minneola
Everett A. Tunnicliff; Manhattan

* Under auspices of the United States Veterans' Bureau.

SUMMER SCHOOL—*concluded.*

Paul Tupper; Lecompton
Mary I. Turley; Abilene
Rowena B. Turner; Manhattan
Wright Edmund Turner; Manhattan
*Logan Rosco Tyson; Wichita
*Royal Newton Umphres; Manhattan
John Bennett Underwood; Manhattan
Manuel Valdes; Santiago, Chile, South America.
Hobart Scott Van Blarcum; Manhattan
Hattie Gertrude Van Druff; Keats
Lillian Luella Vandruff; Keats
Edward Bowman Van Pelt; McPherson
Eva Grace Van Scoick; Aulne
Theodore Maurice Van Scoyoc; Manhattan
*Henry H. Vehnekemp; Monticello, Ind.
Vasileios Royal Vergades; Clay Center
Belle Margaret Viers; Manhattan
Louis Vinke; Manhattan
Helen Wagonseller; Junction City
*Cecil Augustus Waits; Cassoday
Florence Elizabeth Waits; Cassoday
Harria Russelle Walker; Ford
Ida Jane Walker; Manhattan
Wirt Dudley Walton; Leavenworth
Gilmore S. Wann; Hays
Ferne A. Ward; Bancroft
*Isom Raymond Ward; Tampa
*Leo Ward; Kiowa
Blake Wareham; Manhattan
*Rees Conway Warren; Hecla, Wyo.
Frances Elizabeth Washington; Manhattan
Eugene A. Waters; Wellsville
Rolland Hays Waters; Wellsville.
*Carl Otto Watson; Manhattan
Blanche Weaver; Ogden
Lucy S. Weaver; Manhattan
Ella Henrietta Webb; Tonganoxie
Arthur D. Weber; Manhattan
Hazel Emma Weber; Manhattan
Fred E. Weed; Athol
*Lester Raymond Welch; Cherryvale
Ruth Elizabeth Welton; Fairview
Albert Parken Wertman; Washington
Zoe Dorothy Wertman; Manhattan
Vorin Edwin Whan; Manhattan
James Albert Wheeler; Marion
*James M. Whitaker; Manhattan
Nannie Frances Whitman; Kansas City
Gertrude Henrietta Wichers; Downs
*Henry Evert Wichers; Downs
Herbert L. Wilkins; Manhattan
*Francis R. Williams; Broughton
John R. Williams; Washington
Mary Rachel Williams; Emporia
Eugene E. Willison; Manhattan
Fay Bell Wills; Riley
*Joe Lennerd Wills; Greenville, Mo.
Lois Marie Willson; Manhattan
John Cathcart Wilson; Manhattan
*Manry Ray Wilson; Luray
*Murray Alderson Wilson; Baldwin
Richard Clement Wilson; Olathe
Jesse Collins Wingfield; Junction City
Edwin William Winkler; Rozel
Amy Inez Wismer; Pomona
Mildred Henrietta Wismer; Pomona
*Harry Lee Wobbe; Uniontown
Alice Susie Wolfenbarger; Manhattan
*Harry Womack; El Dorado
Chester Stanley Wood; Manhattan
Ethel Frances Wood; Manhattan
Lois Wood; Emporia
Gladys M. Wycoff; Kansas City
Donald Albert Yandell; Wilson
*Claude Newton Yaple; Rago
Susan Elizabeth Young; Jewel
Agnes Lavaughne Youngman; Vermillion
Iscah Marion Zahn; Seneca
*Betista Anton Zappa; Weir
John Williamson Ziegler; Manhattan
Herman Henry Zimmerman; Wellington

Students in Special Courses

The abbreviations following the names of students have the following significations: AMSC, automobile mechanics' short course; BSC, blacksmiths' short course; BldSC, builders' short course; CSC, carpenters' short course; CCSC, commercial creamery short course; ESC, electrical short course; ETC, engineering trade course; FSC, farmers' short course; HSC, housekeepers' short course; MSC, machinists' short course; SA, Vocational School; TOSC, tractor operators' short course.

*Joseph Clayton Achey (SA); Fontana
*William Arthur Agee (SA); Raymondville, Mo.
*Erwin Aikins (SA); Manhattan
*Raymond Akers (ETC); Anderson, Mo.
*James Preston Alexander (SA); Corning
Raymond Allee (TOSC); Grainfield
Everett Allen (SA); Derby
Wayne Allen (FSC); Burlington
*Noble Marrol Allm (ETC); Junction City
George Vivian Anderson (SA); Everest
*Orville Waln Anthony (SA); Hoisington
*Frederick Roe Arnold (ETC); Mercer, Mo.
*Roscoe William Aspley (SA); Abilene
Ethel May Atwood (HSC); Castleton
*Chester Gladstone Aument (SA); Manhattan
*William Stanley Austin (ETC); Collyer
*Bernard Avery (SA); Wichita
*John Thomas Azbell (ETC); Frederickstown, Mo.
Vern Albert Badger (AMSC); Carbondale
Rolland Paul Baillod (SA); Marion
Roy Bainer (SA); Scott City
Vera O'Neil Baker (SA); Manhattan
*Everett Westley Baldwin (ETC); Willow Springs, Mo.
*Edgar Lee Ball (SA); Parsons
Wilard Le Dioyt Ball (SA); Manhattan
*Ira Lee Balsley (SA); Ottawa
Raymond Orris Ballard (FSC); Hardy, Neb.
*William Ballard (SA); Paola
James Nathan Barber (SA); Larned
*Cleo Cee Barnes (SA); Walnut Ridge, Ark.
*Donald Alton Barnes (ETC); Canalou, Mo.
Hannah Helen Barre (HSC); Tampa
John Bartley (BSC); Barnes

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STUDENTS IN SPECIAL COURSES—*continued.*

*Isaiah Isreal Baughman (ETC); Brandsville, Mo.
Walter Teddy Becker (FSC); White City
David Austin Been (FSC); Scott City
*George Luther Bell (ETC); Goff
Gust Adolph Benteman (FSC); Winkler
Edward Gail Betts (SA); Detroit
*George Mike Bhear (SA); Bucyrus
*Nathan Ricker Bickford (SA); Bartlett
*Guy Cecil Bigelow (SA); Peabody
*Asa George Bird (SA); Fort Scott
*Lewis Emmor Bird (SA); Longton
Robert Stuart Bishop (SA); Manhattan
*Lewis Harrison Blockson (ETC); Goff
Glenn Lonker Bloom (FSC); Medicine Lodge
*Benjamin Robert Bockhaus (SA); Halstead
Earl Lawrence Bogue (SA); Manhattan
*Charley Bernhard Bohling (SA); Meade
Robert Murlin Boice (AMSC); Spring Hill
*Walter Chris Boller (SA); Sedgwick
George Robert Boyd (AMSC); Munden
*John Edward Boyle (SA); Harlan, Neb.
Ada Pearl Bradley (SA); Wabaunsee
*Robert Bradshaw (SA); Blowing Rock, N. C.
Frank Brandejsky (SA); Severy
William Bray (SA); Dodge City
Leo Charles Brennan (CCSC); Bonner Springs
Lewis Bridenstine (BSC); Marienthal
Paul Jones Briggs (SA); Protection
*Harry Otis Briscoe (SA); Lincoln
John Edwards Brooks (SA); Manhattan
*Ernest Benton Brown (SA); Richards, Mo.
*Guy Brown (SA); Bellaire
Olin Wendell Brown (AMSC); Hutchinson
Claude Lester Bucknell (FSC); Hardy, Neb.
Milton Earl Burnett (FSC); Mullinville
*Edward Buntzen (ETC); Abilene
*Perry Brittan Burgess (SA); Quenemo
Helen Ferguson Burk (HSC); Ottawa
Morris Burns (CSC); Fall River
*Ira Gilbert Burris (SA); Wichita
*Lennie Irvin Burris (SA); McCune
*John Campbell (SA); Manhattan
Page Campbell (AMSC); Wa Keeney
Elmer LeRoy Canary (SA); Lawrence
Leo Francis Carey (FSC); Reading
*Arvid Carlson (SA); Overbrook
William Wise Carmichael (AMSC); Pratt
Clarence Harold Carnahan (MSC); Randlett, Okla.
Earl Edward Casey (FSC); Independence, Mo.
*Austin Southwell Chapin (ETC); Manhattan
Earl Ambrose Chappell (CCSC); Manhattan
Arthur Julius Christenson (MSC); Jamestown
Everett Kugler Chronister (SA); Abilene
Constance Helen Clark (SA); Clearwater
*Joe Cobb (SA); Manhattan
Roscoe Coberly (SA); Gove
Ernest Benjamin Coffman (SA); Morrill
William Cole (SA); Manhattan
Don Carlos Collins (SA); Kit Carson, Colo.
Harry Lowell Collins (AMSC); Perry
*Wallace Conard (SA); Colorado Springs, Colo.
Robert Belden Cook (SA); Oklahoma City, Okla.
*Ray Cooley (ETC); Bavaria
Howard Merton Coomber (BldSC); Rosedale
John William Cooper (AMSC); Parsons
Franklin Holmes Correll (MSC); Little River
Edward Monroe Coughlin (TOSC); Concordia
Robert Lee Roy Cousins (CCSC); Loch Katrine, N. S., Canada
Frank Marriman Crawford (SA); Manhattan
*Sam Crowcher (SA); Osage
*William Burbank Crowther (SA); Philadelphia, Pa.
*James Joseph Curley (ETC); Manhattan
E. B. Currin (CSC); Manhattan
Gertrude Charlotte Curtis (SA); Ogden
*Frederick Lawrence Dace (SA); Bonne Torre, Mo.
Fred Earl Dakin (FSC); Drexel, Mo.
George Richard Danzelbrink (CSC); Winchester
*Thomas Thompson Davis (ETC); Seneca, Mo.
*Floyd Rosco Dean (ETC); Powhattan
*Grover Dean (SA); Boicourt
Jonas Debard (SA); Arkansas City
*John Deffebach (SA); St. Louis, Mo.
*Alfred Fred Dehn (SA); Atchison
*Samuel Funnston Dennison (SA); St. Louis, Mo.
*Karl Louis Dettmer (ETC); Kensington
Curtis William Dickson (SA); Manhattan
Marion George Dickson (SA); Manhattan
*John Alden Dimmitt (SA); Brookville
Wilbur Douglas (AMSC); Americus
Dayrel Elijah Dove (ESC); Severy
*George Washington Dowell (SA); Springfield, Mo.
Allan Metzler Downey (SA); Manhattan
Harvey Melvin Dreyer SA); Burlington, Okla.
*Oral Lester Drummond (SA); Cantril, Iowa
Howard Wallace Duncan (FSC); Flush
Harold Dewey Dunkelberg (FSC); Osborne
*Frank Alexander Dunlap (ETC); Sterling
*William Ray Dunn (ETC); Neck, Mo.
*Arlie Duree (SA); Leavenworth
*Lee Mohle Eastlick (ETC); Manhattan
*Emile Jean Eaton (SA); Severance
*Clark Trevator Eimer (SA); Williamsburg
*Olaf Victor Eklund (ETC); Scranton
Floyd William Else (AMSC); Fairbury, Neb.
Lewis Chester Emig (FSC); Goodland
Joseph Emonts (CCSC); O'Fallon, Mo.
*Thomas Duncan Eshelman (ETC); Springfield, Mo.
William Esry (CCSC); Manhattan
William Thomas Esry (SA); Manhattan
Paul Freeman Evans (FSC); White City
*Joseph Everett (SA); Marston, Mo.
*Amos Fagan (AMSC); Mansfield, Mo.
*George Earl Faidley (SA); Wakefield
Mary Ann Fankhauser (HSC); Madison
William McKinley Faust (FSC); Highland
Carl Fengel (FSC); Abilene
Anna Margaret Ferguson (SA); Marshall, Mo.
William Dwight Ferguson (FSC); Wellington
Raymond Victor Fickel (SA); Earlton
*Robert Fife (ETC); Iola
*Ray Galloway Fishburn (SA); Garnett
Anton Felix Fleming (ESC); Republic
*Robert Clarence Fleming (SA); Harlowton, Mont.

* Under auspices of the United States Veterans' Bureau.

STUDENTS IN SPECIAL COURSES—*continued.*

Anna Mae Fletcher (SA); Manhattan
*Samuel Warren Fletcher (ETC); Alton, Mo.
*Thomas James Fowler (SA); Muscatine, Iowa
*Leslie Matthew Freeman (SA); Paola
Christal Emerson Gabelman (TOSC); Lincoln
Robert Allison Galbraith (SA); White City
Guy Edgar Gardner (SA); Manhattan
John William Gehrke (SA); Herington
*John Frank Gibbons (SA); St. Louis, Mo.
Carl Dowling Giffin (TOSC); Munn, Colo.
Robert Taylor Gilbert (SA); Calgary, Canada
Leo John Giersch (FSC); Salina
*Clyva Franklin Gobble (SA); Altamont
Arlie Grant (AMSC); Pomona, Mo.
*Oliver Grant (SA); Pomona, Mo.
*Sam Grappia (ETC); Borgetto, Italy
*Ellis Grayson (ETC); Newburg, Mo.
*Albert Best Gregg (SA); Hiawatha
Lee Roy Gregg (AMSC); Stockdale
George Clyde Greve (FSC); Earlton
Inez Dorothy Greve (HSC); Earlton
*Clarence Griffin (ETC); Bernie, Mo.
Ralph Collinwood Grubb (FSC); Netawaka
Frank Alexander Hagans (SA); Manhattan
Hubert Raymond Haile (FSC); Kingsville, Mo.
Robert Kenneth Hall (FSC); Edwardsville
Sidney Ray Hammett (SA); Manhattan
Arthur Briscoe Hand (FSC); Neodesha
Glenn Harold Hanes (FSC); Towanda
*Peter Hansen (SA); Nora, Neb.
*Roy Everett Happel (SA); Effingham
Henry Austin Harbour (SA); Clements
Olin Eugene Hardesty (AMSC); Coldwater
*Harold Artin Harding (SA); Lawrence
John Earl Hargrow (CCSC); Kansas City
Theodore Albert Harrington (AMSC); Wheaton
Frank Harris (BSC); Bavaria
*Lloyd Ellsworth Harris (ETC); Beaver Crossing, Neb.
*Benjamin Charles Harrison (SA); Seneca, N. Mex.
*Roy Charles Harrison (SA); Satanta
*Vertner Hastings (SA); Council Grove
Wilbur Wayne Hatfield (TOSC); Belle Plaine
*August John Hauptle (SA); Glen Elder
*Guy Carpenter Hayes (SA); Kansas City, Mo.
Miriam Bernice Haynes (SA); Manhattan
Winfred Harry Haynes (SA); Grantville
Clifford William Headley (AMSC); Downs
*Raymond Heaton (ETC); Manhattan
*Otis James Heberly (ETC); Minneapolis
*Ike Hedrick (ETC); Bixby, Mo.
Beula Lillian Hendrickson (HSC); Lebanon
*Jesse James Hennon (SA); Sterling
Ralph Stanley Henry (TOSC); Nortonville
Christie Cynthia Hepler (SA); Manhattan
Glenn Hepworth (SA); Manhattan
John Long Hicks (SA); Cuervo, N. Mex.
Howard William Higbee (SA); Fall River
*Charles McKindley Hindman (SA); Coffeyville
Oliver Hines (CCSC) Argentine
Glen Hiskey (BSC); Goodland
*Harley James Hixson (SA); Deering
*John William Hodson (SA); Liberty
*Milton Louis Hoefle (SA); Highland, Ill.
*Frank Hogan (SA); Simmons, Mo.
Olive Blanche Holder (SA); Manhattan
*William Calhoun Holder (SA); Pleasant Hill, Mo.
Earl Robert Honeywell (SA); Manhattan
*Lloyd Edison Hook (SA); Iola
Clarence Martin Hooton (SA); Manhattan
*Alexander Hopkins (ETC); Ottawa
John Horgan (FSC); Pittsburg
*Homer Allen Horn (SA); Troy
*Robert Horton (ETC); Weingarten, Mo.
*Ray Houghton (SA); Emporia
*Rubin Nicholas Houston (SA); Charleston, Mo.
Arthur Dent Hoyle (MSC); Monte Vista, Colo.
*Henry William Hoyer (ETC); Marysville
Eugene Osmond Hoyt (BSC); Goodland
Clarence Lawrence Hummel (CCSC); Cherryvale
*Frederick Otterbine Humrick (SA); Gaylord
*Christopher Columbus Huntley (SA); Lebanon, Mo.
*Herbert Inmon (ETC); Hurley, Mo.
Herbert Irwin (FSC); Conway Springs
*George Jacobs (SA); La Crosse
*Peter Jacobsen (SA); Merrill, Iowa
Oscar Emanuel Janssen (AMSC); Clay Center
*Adolph George Jensen (SA); Neodesha
Arthur Gurner Jevons (AMSC); Wakefield
Allen Johnson (SA); Galva
*Carl Edward Johnson (SA); Sharon Springs
Fred Dudley Johnson (SA); Bonner Springs
Hugo Walter Johnson (SA); Weskan
*Roy Vernon Johnson (SA); Green Forest, Ark.
Leah Marie Johnston (HSC); Topeka
Arnold Paul Jones (AMSC); Manhattan
Arle Henry Jones (AMSC); Manhattan
*Herman Frederick Jorgenson (ETC); Wa Keeney
Vance Doren Kabriel (TOSC); Mina
Ralph Karns (SA); Ada
*Irl Roscoe Keagy (SA); Ottawa
Chester Bonds Keck (SA); Auburn
*Henry Vernon Keller (ETC); Kansas City, Mo.
John Kennedy (SA); Junction City
*Oscar Dunbar Kerr (SA); Windsor, Mo.
*Roy Dewey Kersey (ETC); Eskridge
Lewis Kimbell (SA); Yates Center
*Albert Sidney King (SA); Manhattan
Herbert Adam Kinman (SA); Kansas City
*Arthur Louis Klein (SA); San Marcial, N. Mex.
*Fred Kling (ETC); Scott City
Frank Knapp (FSC); Hartford
Walter James Knapp (CSC); White City
*Peter Knight (SA); Savannah, Ga.
*Alexander Roush Koehn (ETC); McPherson
*Edward Fred Koepsel (ETC); White City
John William Koerner (SA); Wakefield
Ernest Kohler (SA); Forest Park, Ill.
*Henry Gottlieb Kohrs (SA); Dillon
Ira Koogle (BldSC); Chapman
*Loyd Joseph Kostelecky (ETC); Milford
Frank Krause (AMSC); Hillsboro
Ruth Harriet Kurfiss (HSC); Salina
*William John Lampard (SA); St. Louis, Mo.
*Henry Clarence Lane (ETC); Manhattan
Burton Reap Langdon (SA); Manhattan
Thomas Miller Larsen (SA); Kansas City
Clara Elvira Larson (SA); May Day
Fred John Larson (FSC); Everest
John Wallace Larson (FSC); Agra
Ludwig Leander Larson (FSC); Effingham

* Under auspices of the United States Veterans' Bureau.

STUDENTS IN SPECIAL COURSES—*continued.*

Bessie Julia Laswell (HSC); Emmett
William Alfred Latter (AMSC); Topeka
Ruth Marie Lawson (HSC); Stamford, Neb.
*John Atwil Leach (SA); Xenia, Ohio
Rose Etta Leshosky (SA); Belleville
Roy Lewelling (CSC); Delia
*Edgar Lindley (SA); Wichita
*Orville Earl Livingston (ETC); Rifle, Mo.
Clee Albert Lloyd (FSC); Oakhill
Clyde Raymond Lloyd (AMSC); Oakhill
*James Albert Loop (SA); Manhattan
Adolph Lortscher (TOSC); Sabetha
Carlton Theodore Lunt (AMSC); Pratt
Edward William Lutz (SA); Hutchinson
Leonard Allen Lyman (MSC); Fairview
*Ulas Grant McCall (SA); Pearl, Mo.
Ruth McCallum (HSC); Manhattan
Charles Arthur McCoy (FSC); Oneida
Winfield Abraham McCracken (SA); Manhattan
Edwin James McFall (FSC); Oneida
William Lloyd McFall (FSC); Oneida
Joe McFatter (SA); Gem, Tex.
Roswell James McIntosh (SA); Manhattan
*William Henry McKee (SA); Cedar Vale
*Minno Smith McKenney (ETC); Valley Falls
*Henry Mearle McKinney (SA); Horton
*Riley McKinney (SA); Colony
*George McMahon (SA); Topeka
*Asbury Wesley McMinn (SA); Salina
Robert Rhoades McVicar (SA); Wichita
*Andrew Donald MacArthur (ETC); Manhattan
*Laurence Madison (SA); St. Louis, Mo.
*Frank Raymond Mahaffey (ETC); Riceville, Iowa
*William Henry Malone (SA); Fort Scott
*Lloyd Cecile Mann (ETC); Des Moines, Iowa
William Arthur Marfield (SA); Rosedale
Robert Mark (FSC); Madison
Carl William Martin (SA); Dunavant
Christiana Brewbaker Martin (SA); Dunavant
DeWayne Harry Marty (BSC); Courtland
Paul Erastus Massey (SA); Yates Center
William Clyde May (SA); Manhattan
Lueada Meadows (SA); Taft, Okla.
*Fred William Meisner (SA); Cole Camp, Mo.
*Elbert Earl Meldrum (SA); Wichita
William Lester Meyers (FSC); Alta Vista
*Oliver Harrison Mickey (SA); Wichita
Charles Clation Miller (AMSC); Brewster
*Elisha Paul Milton (SA); Larned
Robert Covey Minton (CCSC); Harper
*John Micel Theord Mitchell (SA); Miltonvale
*Melvin Otis Mitchell (SA); Langley
William John Mitchell (SA); Olathe
William Thomas Molyneaux (FSC); Palmer
Claude Earnest More (AMSC); Anness
*Alva Barney Morris (SA); Manhattan
James Blythe Morris (SA); Manhattan
Robert Merton Morrison (SA); Phillipsburg
Charles Roger Mosshart (SA); Manhattan
John Leo Motte (SA); Wallace
Clyde Mounts (SA); Manhattan
*Jesse Mowery (SA); Garden City
*William Isaac Munday (SA); Lindsborg
*Orlin Edward Muntzert (SA); La Harpe
*Fred Franklin Murphy (ETC); Springfield, Mo.
Alvin Laurence Murray (AMSC); Redfield
*Floyd Longley Myers (SA); Berryton
*Milton Gregory Neith (SA); Delavan
Alice Olive Nelson (SA); Agenda
Carl Emanuel Nelson (TOSC); Assaria
Louise Nelson (SA); Troy
Sadie Emelia Myrtle Nelson (SA); Keats
Jennie Viola Nettrouer (SA); Manhattan
*Robert Newman (ETC); Cassoday
Otto Nickel (TOSC); Hillsboro
Glenn Nickerson (SA); Rexford
*John William Neimann (SA); St. Louis, Mo.
*Joseph Henry Noenning (SA); Willow Springs, Mo.
Virgil Glenn Nonamaker (SA); Osborne
*Luther Norris (ETC); Liberal
*Harold Alfred Noyce (ETC); Crete, Neb.
Carl Conrad Olson (TOSC); Angola
John Andrew Olson (FSC); Junction City
John Augustis Olson (AMSC); Junction City
Nels Enoch Olson (TOSC); Assaria
Nels Peter Olson (SA); Brookville
*Earl David Ormsbee (SA); Smith Center
Etoila Matilda Orth (SA); Manhattan
*Charles Calvin Osborn (ETC); Neodesha
Eli Benjamin Packer (SA); Liberal
Edward Palmer (FSC); Plymouth
Ralph George Parker (SA); Manhattan
*Fred Parrish (SA); Ottawa
*Clyde Edd Paschall (ETC); Great Bend
*William Simons Patterson (SA); Ford
Harold Ralph Patton (FSC); Rexford
Mabel Hellois Peak (HSC); Manhattan
Zenia Pearson (SA); Manhattan
Pearly Raymond Pederson (FSC); Clay Center
Samuel Solomon Penner (FSC); Burrton
*Fred Peoples (SA); Elgin
Tillman Peters (FSC); Utica
Ray Lindsey Pettit (SA); Hutchinson
Edmond Ernest Peugnet (SA); Lake Forest
Carl Frederick Pfeifer (FSC); Salina
Myrtle Gladys Piper (SA); Manhattan
Warren Alexander Piper (SA); Manhattan
*Jodie Thomas Pope (SA); Crane, Mo.
John Milford Pratt (BldSC); Herington
*Daniel Price (ETC); Doniphan, Mo.
John Raaf (FSC); Gridley
Marion Noble Rankin (FSC); Ashland
*Vernus Esko Ray (ETC); Manhattan
*Elmer Leonard Reep (SA); Abilene
Libbie Elsie Rehor (HSC); Alton
India Reinhold (SA); St. Francis
*John Richardson (SA); Fountain Grove, Mo.
John Ridder (AMSC); Paxico
John Joseph Rilinger (SA); Seneca
*James Stephen Ritchie (ETC); Browning, Ill.
Edward Chester Robbins (FSC); Belvidere
Maryld Charles Roberts (SA); Paola
*Charles Lee Robinson (SA); Downs
Gomez Robinson (SA); Kansas City
Roy Max Roediger (SA); Manhattan
Herbert Frank Reopke (AMSC); Barnes
*Charley Thomas Rogers (SA); Butler, Mo.
Samuel Nicholas Rogers (SA); Manhattan
*William Jacob Rommelfanger (ETC); Greeley
Harry Dwight Rose (AMSC); Hardtner
*Leroy Andrew Rose (SA); Salina
*Howard Clay Roseberry (SA); Manhattan
Dorothy Ellen Rose (SA); Manhattan
*William Joseph Ross (SA); Bayard
Clarence Rowe (SA); Waldo
Charles George Rott (CSC); Cuba
Merle Ruggles (SA); Independence
*Arthur LeRoy Russell (ETC); Peabody
Golden Dewey Ryan (SA); Manhattan
Herbert Morris Salsbury (ESC); Le Roy
*Leland Lincoln Sanders (SA); Blue Mound
*Austin Milton Sanderson (SA); Lyndon

* Under auspices of the United States Veterans' Bureau.

STUDENTS IN SPECIAL COURSES—*concluded.*

Lillie Sands (SA); Kansas City
*William Sapcut (SA); Apache, Okla.
Maynard Satterthwaite (AMSC); Muscatine, Iowa
Norbert Joseph Schecher (ESC); Bucyrus
Fred Plitt Schell (FSC); Kansas City, Mo.
Lawrence Irwin Schneck (FSC); Larned
Wilhelmina Schrader (HSC); Hiawatha
William Wesley Schrader (AMSC); Hutchinson
*John Carl Schultz (SA); Hornick, Iowa
Clyde Morris Scott (AMSC); Westmoreland
Simon Walter Scott (SA); Kansas City
*Mavis Seal (ETC); Minimum, Mo.
*Isaac Wesley Seamands (ETC); Joplin, Mo.
*Guy Sharer (ETC); Salina
George Boyonton Sheets (FSC); Topeka
*Rudolph Frank Sheets (ETC); Cawker
*Edward Russell Shouse (SA); Niles
Howard Francis Siegel (SA); Marquette, Mich.
Arthur Carter Silkman (SA); Manhattan
*Aaron Lloyd Simpson (ETC); Illmo, Mo.
*Risher Millerin Sisk (ETC); Creditville, Mo.
*Orville Thomas Slaughter (SA); Montrose
*George Taylor Smart (SA); Cottontown, Tenn.
Arnold Clarence Smith (AMSC); Wa Keeney
Ralph Smith (SA); Independence
*Ralph Lawrence Smith (SA); Cedar Vale
*Wilson Smith (ETC); Strong City
Elbert Merl Smithson (FSC); Herington
*William Snyder (SA); Price, Utah
*Corwin Spencer (SA); Oakley
Roy Heath Spencer (AMSC); Hoisington
Clarence Sprout (SA); Turon
*Clyde Luther Stafford (SA); Cuba
James Oscar Stanton (SA); Trego
*Jesse Gaylord Stanton (SA); Wa Keeney
*Walter Raleigh Stanton (SA); Hutchinson
Ernest Steiner (AMSC); Sabetha
Frank Henry Stewart (TOSC); Fowler
Harvey Stewart (FSC); Americus
Floyd Aron Steffe (AMSC); Sedgwick
Lemuel Varian Stone (AMSC); Dodge City
*Clyde Stout (SA); Manhattan
Floyd Dewey Strong (SA); Manhattan
*Ralph Stumbaugh (SA); Marsh Creek, Mo.
George Edward Stutz (SA); Manhattan
*Ernest Lewis Suddarth (ETC); Manhattan
Ruben Bernard Sundgren (SA); Sitka
Earl Eugene Sutton (SA); Hutchinson
Helen Augusta Swallow (SA); Manhattan
*Robert Burns Swan (SA); Wayside
Harry Conrad Tamman (AMSC); Pawnee Rock
Minnie Christina Marie Tammen (HSC); Fawnee Rock
Allen Charles Theiss (SA); Hutchinson
Gladys Thomson (HSC); Elmdale
Lucille Constance Thornburgh (SA); Jetmore
Jean Kenneth Tinder (SA); Parsons
*William Howard Tinker (SA); Windsor, Mo.
Harry Adolph Toburen (TOSC); Cleburne
Paul Toburen (TOSC); Randolph
Everett Winfield Todd (TOSC); Clay Center
*Edward Tommer (SA); Ogden
Claud Ward Towne (FSC); Osborne
*Frank Raymond Townsend (SA); Madison
*John Lee Travis (ETC); Shrub Oak, N. Y.
Daisy Dell Trester (HSC); Wichita
Russell Trimmer (AMSC); White Water
*Logan Rosco Tyson (ETC); Wichita
Lorene Renata Uhlrig (SA); Belvue
Lucille Adelia Uhlrig (SA); Belvue
*Ralph Edward Upham (SA); Ogden
Harold Van Horn (FSC); Greeley
Hubert Theodore Vandorn (AMSC); Frankfort
Ralph Stewart Vasey (TOSC); Oakhill
Martha Bessie Velharticky (HSC); Woodston
Mona May Vogelman (SA); Clay Center
Ralph von Riesen (CCSC); Marysville
John Thomas von Treba (SA); Oswego
Clyde McFarland Voshell (SA); Bucklin
*Cecil Augustus Waits (ETC); Cassoday
*Carl Samuel Walker (SA); Waterville
Clarence Dale Walker (SA); Yewed, Okla.
William Irving Walker (SA); Manhattan
Melvin Claycomb Wallace (SA); Eureka
Ferne Angie Ward (SA); Solomon
*Leo Sesory Ward (ETC); Kiowa
Ruth Harriett Warlick (SA); Manhattan
Brown Washington (MSC); Manhattan
*Lester Earl Waters (ETC); Preston
James Arthur Watrous (SA); Manhattan
Leonard Earnest Watrous (SA); Manhattan
*Carl Otto Watson (SA); Weir
Elmer Lawrence Watters (SA); Marysville
*Clemul Ovid Weatherman (ETC); Springfield, Mo.
*Otis Weatherman (ETC); Rifle Hill, Mo.
Allen Marcus Webster (SA); Vesper
*Everett John Weeks (SA); Belvue
Harry Joseph Weishaar (TOSC); Nortonville
*Leroy Andrew Welborn (SA); Axtell
*John Welch (SA); Chanute
Lester Raymond Welch (ETC); Cherryvale
Richard Clinton Wells (ESC); Manhattan
*Jacob Louis Wenger (SA); Sabetha
Harriet Fagerstrome Wheeler (HSC); Manhattan
Clarence Boyd White (AMSC); Faulkner
Cecil Ray Whitely (BSC); Abilene
*Jube Lee Whitson (SA); Lost Springs
Faye Edith Wickham (SA); Manhattan
Verne Delmer Wickham (SA); Manhattan
Theodore Roosevelt Wight (FSC); Belle Plaine
Owen Wilber (FSC); Belleville
Donald Zina Wilcox (TOSC); Minneapolis
Alexander Wildy (TOSC); New Athens, Ill.
*Claude John Wilkers (SA); Cole Camp, Mo.
Hugh Wilson Wilkin (SA); Lyndon
*Harrison Williams (SA); Hartville, Mo.
Walter Carl Williams (TOSC); Carlton
*Joe Lennerd Wills (SA); Greenville, Mo.
Clay Ellsworth Wilson (AMSC); Wamego
Otis Harold Wilson (CSC); Jennings
Harry Franklin Winkler (FSC); Rozel
*Roy Lucious Winston (SA); Maplehill
Raymond John Wismer (SA); Pomona
*Harry Lee Wobbe (SA); Uniontown
Wallace Donaphan Wierner (FSC); Clay Center
Ethel Frances Wood (SA); Manhattan
*Earl Lloyd Woodard (SA); Dodge City
Oriel William Young (SA); Kansas City
Leo Alphonso Youngblood (AMSC); Oklahoma City, Okla.
*Joseph Clark Younkin (SA); Wakefield
*Betista Anton Zappa (ETC); Weir

* Under auspices of the United States Veterans' Bureau.

Summary of Attendance, 1921-'22

	Agriculture		Veterinary Medicine		Agricultural Engineering		Architecture		Civil Engineering		Electrical Engineering		Mechanical Engineering		Flour Mill Engineering		Home Economics		General Science		Rural Commerce		Industrial Journalism		Music		Biochemistry		Industrial Chemistry		Totals			Grand total
	Men.		Men.		Men.		Men.		Men.		Men.		Men.		Men.		Women.		Men.	Women.	Men.	Women.	Men.	Women.	Men.	Women.	Men.		Men.		Men.	Women.	Total.
Graduate	*32		1		.....		1		1		2		*8		.....		7		54	18	.....	.....	1	.....	.....	.....	.....		.....		98	27	125
Senior	82		10		4		9		11		33		17		2		68		19	22	1	.....	8	5	1	2	.....		2		199	97	296
Junior	80		21		11		8		33		51		25		1		105		23	27	10	.....	10	8	1	4	.....		4		278	144	422
Sophomore	139		12		7		16		50		63		39		6		121		28	47	31	1	15	11	1	28	.....		13		420	208	628
Freshman	120		16		18		*28		73		156		46		8		206		60	50	57	1	17	20	3	45	1		6		608	323	931
Special	†41		8		3		1		6		9		6		1		26		39	58	6	1	4	4	1	7	.....		.....		122	99	221
The Vocational School	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		265	32	297
Housekeepers' Short Course	.....		.....		.....		.....		.....		.....		.....		.....		19		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		.....	19	19
Engineering Special Courses:																																
Auto Mechanics	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		45	.....	45
Blacksmiths	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		7	.....	7
Builders' Course	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		3	.....	3
Carpenters	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		7	.....	7
Electricians	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		5	.....	5
Machinists	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		6	.....	6
Tractor Operators	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		21	.....	21
Two-year Trade Course	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		79	.....	79
Agriculture Short Courses:																																
Farmers' Short Course	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		59	.....	59
Creamery Short Course	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		10	.....	10
Summer School	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		510	310	820
Federal Board for Vocational Education (included in above figures)	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		370	2	372
Totals	494		68		43		*63		174		314		*141		18		552		223	222	105	3	55	48	7	86	1		25		3,112	1,261	4,373
Duplicates	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		698	115	813
Net totals	.....		.....		.....		.....		.....		.....		.....		.....		.....		.....	.....	.....	.....	.....	.....	.....	.....	.....		.....		2,414	1,146	3,560

* 1 Woman. † 3 Women.

Students by States and Counties, 1921-'22

Kansas	3,149	Montana	2
Arizona	3	Nebraska	25
Arkansas	16	New Jersey	1
California	10	New Mexico	6
Colorado	22	New York	3
Connecticut	1	North Carolina	5
Delaware	1	North Dakota	2
Florida	1	Ohio	5
Georgia	1	Oklahoma	39
Idaho	2	Pennsylvania	7
Illinois	15	South Dakota	2
Indiana	7	Tennessee	1
Iowa	14	Texas	12
Kentucky	2	Utah	1
Louisiana	4	Virginia	1
Maine	2	Washington, D. C.	1
Massachusetts	5	Wisconsin	2
Michigan	7	Wyoming	2
Minnesota	1		
Missouri	151	Total	3,532

FOREIGN COUNTRIES

Bolivia	1	Mexico	4
Brazil	4	Philippine Islands	4
Canada	2	Serbia	1
Chili	1	South Africa	2
China	4	Syria	1
Egypt	3		
Italy	1	Total	28

Grand total, 3,560

KANSAS COUNTIES

Allen	30	Linn	17
Anderson	18	Logan	10
Atchison	16	Lyon	33
Barber	24	McPherson	35
Barton	28	Marion	32
Bourbon	15	Marshall	48
Brown	39	Meade	3
Butler	41	Miami	28
Chase	19	Mitchell	21
Chautauqua	18	Montgomery	30
Cherokee	15	Morris	19
Cheyenne	2	Nemaha	42
Clark	7	Neosho	24
Clay	49	Ness	9
Cloud	39	Norton	18
Coffey	27	Osage	29
Comanche	15	Osborne	41
Cowley	43	Ottawa	27
Crawford	18	Pawnee	14
Decatur	9	Phillips	18
Dickinson	68	Pottawatomie	50
Doniphan	16	Pratt	23
Douglas	24	Rawlins	2
Edwards	9	Reno	71
Elk	8	Republic	29
Ellis	13	Rice	35
Ellsworth	15	Riley	807
Finney	19	Rooks	13
Ford	32	Rush	11
Franklin	37	Russell	28
Geary	29	Saline	48
Gove	6	Scott	5
Graham	5	Sedgwick	74
Gray	1	Seward	10
Greenwood	24	Shawnee	85
Hamilton	3	Sherman	8
Harper	25	Smith	24
Harvey	27	Stafford	22
Haskell	1	Stephens	4
Hodgeman	6	Sumner	40
Jackson	31	Thomas	9
Jefferson	34	Trego	15
Jewell	16	Wabaunsee	34
Johnson	15	Wallace	9
Kearny	3	Washington	39
Kingman	13	Wichita	6
Kiowa	7	Wilson	21
Labette	41	Woodson	11
Lane	2	Wyandotte	79
Leavenworth	24		
Lincoln	13	Total	3,149

Record of Attendance, 1863-1922

College Year	Summer School	Housekeeper short course	Commercial Creamery short course	Dairy, short course	Farmers' short course	Apprentice	Special	Preparatory	Subfreshman	Vocational school	Freshman	Sophomore	Junior	Senior	Graduate	Counted twice	Total	Graduated
1863-64	....	....	....	....	....	....	....	93	....	....	14	....	....	....	....	....	107	....
1864-65	....	....	....	....	....	....	....	90	....	....	14	8	1	....	....	....	113	....
**1865	....	....	....	....	....	....	....	112	....	....	28	5	5	....	....	....	150	....
1866-67	....	....	....	....	....	....	....	154	....	....	11	7	1	5	....	....	178	5
1867-68	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	168	....
1868-69	....	....	....	....	....	....	....	146	....	....	11	10	2	....	1	....	170	....
1870-71	....	....	....	....	....	....	....	164	....	....	13	7	5	5	....	....	194	5
1871-72	....	....	....	....	....	....	....	162	....	....	22	10	3	2	3	....	202	3
**1873	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	*217	2
1873-74	....	....	....	....	....	....	....	136	....	....	24	14	3	6	....	....	183	5
1874-75	....	....	....	....	....	....	....	103	....	....	26	10	2	2	....	....	143	2
1875-76	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	232	5
1876-77	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	234	9
1877-78	....	....	....	....	....	....	....	75	....	....	42	23	5	5	....	....	150	4
1878-79	....	....	....	....	....	....	1	....	....	....	89	89	16	12	....	....	207	9
1879-80	....	....	....	....	....	....	1	....	....	....	166	61	35	11	2	....	276	7
1880-81	....	....	....	....	....	....	6	....	....	....	178	48	24	9	2	....	267	8
1881-82	....	....	....	....	....	....	5	....	....	....	227	50	19	11	....	....	312	9
1882-83	....	....	....	....	....	....	4	....	....	....	241	60	30	12	....	....	347	12
1883-84	....	....	....	....	....	....	2	....	....	....	255	92	26	18	2	....	395	17
1884-85	....	....	....	....	....	....	2	....	....	....	271	71	36	16	5	....	401	14
1885-86	....	....	....	....	....	....	1	....	....	....	273	91	35	24	4	....	428	21
1886-87	....	....	....	....	....	....	....	....	....	....	303	100	44	24	10	....	481	21
1887-88	....	....	....	....	....	....	....	....	....	....	305	92	46	27	2	....	472	22
1888-89	....	....	....	....	....	....	....	....	....	....	266	103	41	28	7	....	445	25
1889-90	....	....	....	....	....	....	1	....	....	....	307	105	63	28	10	....	514	27
1890-91	....	....	....	....	....	....	....	....	....	....	343	135	50	53	12	....	593	52
1891-92	....	....	....	....	....	....	....	....	....	....	336	139	62	37	10	....	584	35
1892-93	....	....	....	....	....	....	....	....	....	....	339	110	66	43	29	....	587	39
1893-94	....	....	....	....	....	....	....	....	....	....	275	141	72	42	25	....	555	39
1894-95	....	....	....	....	....	....	5	....	....	....	276	108	89	64	39	....	572	57
1895-96	....	....	....	....	....	....	3	....	†	....	353	121	67	71	32	....	647	66
1896-97	....	....	....	....	....	....	6	67	....	....	321	163	69	62	46	....	734	55
1897-98	....	....	....	6	....	9	15	77	....	....	316	174	77	82	57	10	803	69
1898-99	....	....	....	26	....	35	40	110	....	....	306	177	92	65	40	21	870	53
1899-1900	....	24	....	57	47	50	32	162	....	....	376	163	109	69	27	22	1,094	58
1900-01	....	47	....	72	109	79	23	318	....	....	348	183	80	74	40	52	1,321	60
1901-02	....	41	....	66	125	87	19	298	....	....	396	206	120	65	32	59	1,396	52
1902-03	....	63	....	38	123	78	36	342	....	....	471	229	141	86	24	57	1,574	55
1903-04	....	51	....	16	122	72	33	443	....	....	403	206	161	114	20	36	1,605	102
1904-05	....	88	....	24	99	12	30	500	....	....	289	198	122	117	26	43	1,462	107
1905-06	....	92	....	28	118	....	46	598	....	....	373	214	145	110	30	64	1,690	96
1906-07	....	134	....	23	179	Engineering	48	144	511	....	411	269	149	133	24	88	1,937	119
1907-08	....	188	....	26	173	Short Courses.	42	134	528	....	450	357	202	148	26	82	2,192	116
1908-09	....	168	....	18	197		42	134	521	....	491	381	243	171	28	86	2,308	139
1909-10	....	152	4	111	124		87	89	453	....	456	417	286	170	26	70	2,305	146
1910-11	31	142	9	26	285		94	....	364	....	533	412	288	248	34	59	2,407	204
1911-12	94	160	14	Lunch room managem't	280		85		580	....	337	461	288	261	44	81	2,523	230
1912-13	282	175	11		289		129	Milling.	654	....	444	432	355	268	55	166	2,928	232
1913-14	370	149	12		223		112	Short Course.	....	658	516	431	324	327	64	159	3,027	289
1914-15	472	127	18		199	....	120		....	560	575	368	383	321	48	200	3,089	229
1915-16	536	85	17		207	188	175		....	484	605	454	305	401	76	219	3,314	357
1916-17	586	103	14		228	191	171		....	422	693	471	378	282	68	277	3,340	210
1917-18	481	92	....	8	119	135	138		....	231	483	349	294	239	36	190	2,406	190
1918-19	519	25	5	....	160	400	199		....	216	810	322	254	201	34	144	2,991	171
1919-20	415	57	3	6	117	354	271		....	224	894	401	300	269	43	167	3,352	272
1920-21	604	30	10	....	96	278	270	8	....	280	878	602	318	273	42	294	3,395	262
1921-22	820	19	10	....	59	173	297	....	....	221	931	628	422	286	125	813	3,560	....

* Estimated. ** Calendar year.

College Enrollment, 1921-'22

The Divisions.	Men.	Women.	Total.
The Division of Agriculture	**559**	**4**	**563**
Graduate students	31	1	32
Seniors	82	.....	82
Juniors	80	.....	80
Sophomores	139	.....	139
Freshmen	120	.....	120
Special students	38	3	41
Students in Farmers' Short Course	59	.....	59
Students in Creamery Short Course	10	.....	10
The Division of Veterinary Medicine	**68**	.....	**68**
Graduate students	1	.....	1
Seniors	10	.....	10
Juniors	21	.....	21
Sophomores	12	.....	12
Freshmen	16	.....	16
Special Students	8	.....	8
The Division of Engineering	**924**	**2**	**926**
Graduate students	11	1	12
Seniors	76	.....	76
Juniors	129	.....	129
Sophomores	181	.....	181
Freshmen	328	1	329
Special students	26	.....	26
Students in Short Course for Auto Mechanics	45	.....	45
Students in Short Course for Tractor Operators	21	.....	21
Students in other Engineering Short Courses	28	.....	28
Two-year Trade Course	79	.....	79
The Division of Home Economics	.....	**552**	**552**
Graduate students	.....	7	7
Seniors	.....	68	68
Juniors	.....	105	105
Sophomores	.....	121	121
Freshmen	.....	206	206
Special students	.....	26	26
Housekeepers' Short Course	.....	19	19
The Division of General Science	**416**	**359**	**775**
Graduate students	55	18	73
Seniors	31	29	60
Juniors	48	39	87
Sophomores	88	87	175
Freshmen	144	116	260
Special students	50	70	120
The Vocational School (Secondary School)	**265**	**32**	**297**
Students under jurisdiction of Federal Board for Vocational Education (included in total figure)	154	.....	154
The Summer School	**510**	**310**	**820**
Totals	3,112	1,261	4,373
Duplicates	698	115	813
Net totals (not including lists cited below)	**2,414**	**1,146**	**3,560**
The Division of College Extension	.....	.....	**37,472**
Students in Credit Courses	.....	.....	476
Students in Vocational Courses	.....	.....	496
Individuals receiving three or more Free Lessons or Instruction Sheets	.....	.....	36,500

Home Study Service Students

(Instruction by Correspondence)

For the year January 1, 1921, to January 1, 1922, the new enrollments for credit courses numbered 476 and those for extension or vocational courses 496. These numbers do not include enrollments holding over from the previous year. During the same period there were sent out 1,300 lessons to stationary engineers, and 42,300 follow-up lessons.

In the following list of enrollments, those taking credit courses are indicated by (c), and those taking vocational courses by (v).

Josephine Acker (c); Junction City
Wm. M. Abernathy (v); Pocahontas, Mo.
Mrs. Mayme W. Abernathy; Advance, Mo.
Benj. Abernathy (v); Oak Ridge, Mo.
Geo. T. Abell (c); Orion
Harry L. Adams (v); Chillicothe, Mo.
H. J. Adams (c); Cimarron
Claude L. Adams (c) Dodge City
Hazel Dell Adams (c); Oil Hill
Arvid W. Adell (c); McPherson
Dale Allen (c); Burlington
O. J. Allen (v); Coffeyville
Bernice Allen (c); Mountain Grove, Mo.
R. C. Alvord (v); Vinland
T. S. Anderson (c); McPherson
Ross M. Anderson (v); Gypsum
Jno. B. Anderson (v); Albion, Neb.
Jno. J. Anderson (v); Marfa, Tex.
A. T. Anderson (v); Whiting, Iowa
Edwin A. Anderson (v); Bronson, Minn.
Jno. A. Anderson (v); Minneapolis, Minn.
Carl Anderson (v); Le Loup
Harry L. Anderson (v); Burlington, Iowa
Harm Aries (c); Waterloo, Iowa
Mabel Archer (c); Densmore
Mrs. Bertha P. Arnold (c); Pratt
Elbert L. Arendall (v); Steele, Mo.
Frank E. Arner (c); Casper, Wyo.
Mrs. Edith Atkins (c); Lyndon
William R. Atkins (v); Stoneburg, Tex.
W. A. Atchison (c); Topeka
Elmer R. Axton (v); Joplin, Mo.
Alvin M. Axen (v); Stanton, Neb.
Wm. J. Aulsebrook (c); Grainfield
Frank C. Baker (v); Kansas City, Mo.
Ruth J. Bailey (c); Pratt
Glenn C. Bailey (v); Pratt
Dean Bailey (c); Scranton
Gladys Aileen Bailey (c); Almena
W. R. Ball (c); Bendena
Louis M. Ballon (v); Delphos
Alpha Bales (v); Pratt
Emery L. Barker (v); La Harpe
P. M. Barger (v); Coleridge, Neb.
Lloyd Barnes (v); Henton, Iowa
Bert R. Barnard (v); Rockport
Perry Barnett (v); South Sioux City, Iowa
Sylvester Baronner (c); Hollidaysburg, Pa.
Frances Batdorf (c); Burlington
Thomas Bahon (c); Severy
Roy Bainer (c); Scott City
Florence Banker (c); Lawrence
Calvin W. Banta (v); Atoka, Okla.
Paul Basey (v); Medicine Lodge
Claude R. Bassham (v); Van Buren, Ark.
John G. Ballard (c); Manitou, Colo.
Margaret Bane (c); Liberal
Denise Baudry (c); Atchison
Emery Babb (v); Wakefield
Albert E. Bean (v); Mason City, Iowa
Elwin Bearly (c); Protection
Floyd Becker (c); Logan
Helen Beck (c); Spearville
Earl H. Becker (v); Rye, Colo.
Robert M. Bell (v); Pratt
Mrs. C. C. Bell (v); Sedgwick
Wayne Bell (c); Burns
Dorothy Belt (v); Lane
Don Benson (c); Greeley
Virgil Benton (c); Merriam
Helene Bentley (c); Sterling
Albert O. Bennett (v); Caruthersville, Mo.
Wm. M. Berkeybile (c); McCook, Neb.
August Bertram (v); Parkston, S. Dak.
Otto Bergner (v); Pratt
Edward Bergstom (v); Cuba
Anna L. Best (c); Manhattan
Mary Betz (c); Asherville
Oral Bishop (c); Logan
Lloyd Bishop (v); Canton
S. W. Black (v); Columbus
Robert F. Blanks (c); Burley, Idaho
Elijah Bledsoe (v); Mt. Grove, Mo.
Elizabeth Blockcolsky (c); Manhattan
Nora Blockcolsky (c); Manhattan
Alva H. Bloom (v); Clarinda, Iowa
O. T. Bonnett (c); Blue Rapids
Albert Boothe (c); Colfax, Iowa
J. H. Borror (c); Westphalia
Wm. Boucek (v); Ada
Edgar Bourke (v); Sedalia, Mo.
Bower Milling Co. (v); Independence, Mo.
Lawrence A. Box (v); San Antonio, Tex.
Jno. P. Boyle (v); Soldiers' Home, Cal.
Charlie H. Boyer (v); Centerville, Iowa
Chester Bradshaw (c); Altoona
Sadie Brainerd (c); White Water
Chas. F. Branan (v); Princeton
Edward Brandes (v); Manville, Iowa.
Meck Brazelton (v); Troy
Joseph Brabec (v); Narka
Homer Breault (v); Concordia
Earl Breazier (v); Lincoln
Laura Brenkman (c); Madison
Thos. Brinson (v); El Dorado
Paul J. Briggs (c); Protection
Saluatore Brocato (c); Kansas City, Mo.
Laurel G. Brown (c); Overbrook
Charles L. Brown (c); Manhattan
Blanchard O. Brown (v); Sheldon, Wis.
Marguerite Brown (c); Bucklin
Bernard V. Brown (v); Baltimore, Md.
Gerald G. Brown (c); Junction City
J. O. Brown (v); Burlington
Frank Brown (v); Omaha, Neb.
Homer G. Bryson (c); Leon
Vergil Bryant (v); Gooding, Idaho
Mrs. Clara Brunsell (v); Lindsborg
L. G. Brush (v); Wichita
Florence M. Burton (c); Haddam
Howard E. Burton (c); Council Grove
Orvil Butler (v); Council Bluffs, Iowa
Cullen I. Burnett (c); Hill City
Oliver C. Buxton (v); Alba, Mo.
Basil F. Burdell (v); St. Louis, Mo.

HOME STUDY SERVICE STUDENTS—*continued.*

R. L. Bumgardner (c); Manhattan
Frank G. Burk (v); East Alton, Ill.
Mitchell Bufford (v); Van Buren
Hazel Burdette (c); Severy
Guenn E. Byarlay (c); Manhattan
Ina Campbell (c); Lake City
Manley A. Casement (c); Manhattan
Wm. R. Carpenter (v); Glen Elder
Jos. T. Casey (v); St. Louis, Mo.
Walter E. Caywood (v); Netawaka
Rollie C. Canfield (v); Belleville
Geo. Cashat (v); Charleston
Leo B. Carruthers (v); Lenox, Iowa
Harry Caughey (c); Asherville
Roy R. Cameron (c); St. George
Rose Carey (c); Houston, Tex.
Avery M. Cain (v); St. Louis, Mo.
Mrs. W. E. Cain (v); Albert
Virgil M. Carr (v); Clear Lake, Iowa
James H. Carr (v); St. Louis, Mo.
Jno. W. Caldwell (v); Des Moines, Iowa
Mabel Caldwell (c); Caldwell
Chas. John Chaloupka (v); Dubuque, Iowa
Neils P. Christensen (v); Parkersburg, Iowa
Geo. K. Chew (c); Manhattan
Ella J. Christenson (c); Esbon
Inez E. Chenn (c); Dwight
Marian Chandler (c); Tulsa, Okla.
Etta E. Chillson (c); Manhattan
Hazel Cheatham (c); Mulvane
H. L. Clark (v); Downs
Leo M. Clark (c); Manhattan
Roxie O. Clark (c); Manhattan
Ira M. Clark (v); Glasco
Mary Jane Clark (c); Anthony
Mrs. H. L. Clark (v); Downs
Mrs. Chas. Clark (v); Mound City
John B. Claxton (v); Churubusco, Ind.
Harry P. Clare (v); Granite City
Mahala Clement (v); Hiawatha
Robert E. Clelant (c); Manhattan
Fred Cocherell (c); Neosho Falls
Frank H. Collins (c); Wellsville
Irene Conroy (c); Manhattan
I. D. Conroy (c); Junction City
Arthur E. Cook (c); McDonald
Albert Cook (v); Pratt
Avis Cooley (c); Logan
Wm. Dale Coons (c); Spring Hill
Roy Connor (v); Hoisington
Mary Conover (c); Fowler
S. D. Capper (v); Beloit
Mona Corkill (c); Nortonville
Geo. Henry Cornelius (v); St. Louis, Mo.
A. B. Cowan (c); Ransom
Leilyn M. Cox (c); Beloit
Mrs. C. E. Cox (v); Harveyville
Edgar Crabb (c); Lebanon
Joseph A. Craig (v); Youngstown, Ohio
Mrs. Carl Cramer (c); Manchester
Calvin W. Craven (c); Logan
V. S. Crippen (v); Pratt
K. R. Crow (c); Carbondale
Stella Cross (c); Merriam
Frank M. Crouch (v); Clarksville, Ark.
Elva Crockett (c); Manhattan
Roy B. Crumb (v); Brown
Leila L. Curry (c); Norton
Wm. E. Dean (c); Delphos
Raymond C. Deering (v); Boone, Iowa
Irene Daniel (c); Sublette
Dorothy M. Daniel (c); Neodesha
John Davidson (v); Columbus
Gladys Davidson (c); Solomon
Blossom Davidson (c); Eskridge
Anna Davis (c); Abilene
Lyle H. Davis (c); Hays
Grace O. Day (c); Greenleaf
James A. Dawson (v); Ysleta, Tex.
Louise H. Dart (c); Kansas City
Gladys Dallas (c); Harveyville
Homer Dean Dale (c); Wellington
Earl G. Darby (c); Manhattan
Rollins Dennen (c); Blue Hill, Neb.
Frank J. Denton (v); Denton
Dolley Devenney (c); Junction City
Chas. De Vore (c); Newellton, La.
Gladys De Vore (c); Protection
Warren Dickinson (v); Gering, Neb.
C. W. Dickson (c); Manhattan
Ralph Dickey (v); Nye
Orville Dickey (v); St. Louis
Frank Dieter (v); Oakhill
Edw. P. Dillon (v); St. Louis, Mo.
Harlan Dilley (c); Enterprise
Edward Dodd (v); Omaha, Neb.
Fred H. Dodge (c); Manhattan
Richard Dodson (v); Newburg, Mo.
John Donnan (v); Youngston, Ohio
James D. Dresser (c); Piper
Herbert C. Douglas (v); Creston, Iowa
Hiram Downs (v); Orchard, Neb.
D. L. Downing (v); Effingham
Mrs. Mary Dubbs (c); Ransom, Mo.
Iva A. Dugan (v); Effingham
Mrs. Zelda Dulebohn (c); Hill City
L. A. Dumond (c); Holcomb
Claire Dunbar (c); Columbus
Ruth Dunn (c); Dodge City
Claude J. Duncan (c); Washington
Jack W. Dunlap (c); Scott City
M. V. Dunlap (v); Osawatomie
Alma E. Dusenberry (v); Ionia
Floyd E. Dyer (v); Bertrand, Neb.
W. H. Ebersole (c); Bushton
Willo Edmonds (c); McLouth
Martin G. Ehlers (v); Wadena, Minn.
Inez V. Ekdahl (c); Manhattan
Julien R. Elliott (v); Gilman, Ill.
Jas. Elliott (c); Belleville
Marjorie Ellis (c); Bucklin
Dorothy Ellis (c); Manhattan
Crissie Ellmers (v); Orleans
St. Elmo Else (c); Osborne
Mrs. Ida Ely (v); Inman
Arthur L. Emich (v); St. Louis, Mo.
V. S. Engel (v); Wakefield
Ruth Ennefer (c); Pleasanton
Chas. Enos (v); St. Joseph, Mo.
Eleanor D. Encell (c); Howard
Anna Erickson (c); Junction City.
R. A. Esdon (c); Chase.
Robert E. Eubank (c); Hopewell
Darrel Evans (c); Manhattan
Neal Evans (v); Jewell
Hilda Evans (v); Chillicothe, Mo.
E. W. Evers (v); Belle Plaine
Ralph Ewalt (c); Medicine Lodge
Ray H. Ewalt (c); Manhattan
Waldron D. Fair (c); Barber
C. E. Faler (v); Rock
Samuel G. Farrar (v); Phillis, Va.
Wm. Fear (c); Junction City
David Feese (c); Manhattan
Harley A. Fields (v); Seawood, Ohio
Jean M. Fielder (c); Wilson
Joseph P. Flynn (c); Palmer
Wm. Finn (c); Sedgwick
Burton F. Fisher (v); Charles City, Iowa
O. F. Fisher (c); Cleveland, Ohio
Frances Fitzgerald (c); Waterville
Mrs. Blanche Forrester (c); Manhattan
G. R. Force (v); Salina
Edward T. Forst (v); Crete, Neb.
Margaret Foster (c); Republic

HOME STUDY SERVICE STUDENTS—*continued.*

John P. Foster (v); Delta, Colo.
Allen Fowler (c); Topeka
Geo. F. Fox (c); Neosho Falls
M. D. Frazier (v); Pittsburg
Carol Frank (c); Mound Valley
Harold Freeby (v); Marysville
Oscar E. French (v); Marion
B. B. French (v); Pawnee Rock
W. L. French (v); Abilene
Marie Fritzlen (c); Kingsdon
Ruth E. Frye (c); Richland
Frank Fray (v); Homewood
Jas. Scott Fullington (v); Idana
Beatrice Gaither (c); Argentine
Mrs. D. W. Galle (c); Moundridge
John C. Gard (c); Manhattan
Martha Garlook (c); Stanley
Harvey J. Gates (v); Boone, Iowa
Glen E. Gates (c); Kansas City
James A. Gates (v); Steelville, Mo.
Freda Geffert (c); Barnes
Wm. Edward Geiles (v); St. Louis, Mo.
Mrs. Edith Gere (v); Inman
S. J. Gilbert (v); Woodston
Wade L. Gilbert (v); Barryton
Clyde Gillespie (v); Bentley
H. E. Gillette (v); Ottawa
Wm. J. Gillette (c); Parsons
H. S. Gish (v); Whiting
Frances Gisi (v); Perryville, Mo.
Ray C. Gladson (v); Ottumwa, Iowa
Herbert Classford (v); Fort Madison, Iowa
Wilford Galladay (c); Junction City
Mabel Godsey (v); Agenda
Arthur Goehring (v); Ottumwa, Iowa
Dewey A. Goerke (v); Sterling
Howard Good (v); Manhattan
Harold E. Goody (v); Spokane, Wash.
Walter Gonder (v); Turon
Walter Gordon (v); Cedar Rapids, Iowa
H. F. Graham (c); Cawker City
Thomas W. Graham (v); Dubuque, Iowa
Lola Graham (c); Wichita
Walter Graham (c); Manhattan
Virgil C. Gregg (v); Pittsburg
Lucille Gramse (c); Perry
Emery E. Gray (v); Browning, Mo.
Abel C. Greenway (v); Shenandoah, Iowa
Nellie Griffith (c); Elmont
S. A. Grindol (v); Perry
Ora Giersich (c); Bison
Garnet Grover (c); Manhattan
Harry L. Gui (c); Manhattan
Pearl M. Gunsaullus (c); Mount Hope
Paul F. C. Haack (v) Newdale, Idaho
Alvin B. Haines (c); Hutchinson
Oscar C. Hall (v); Webster City, Iowa
Cecil W. Hall (c); Manhattan
Floyd Hamilton (v); Marcus, Iowa
Eldee Hamm (v); Muldrow, Okla.
Nellie M. Harper (c); Stark
Thomas J. Harrell (v); Liberal
Ernest Hartman (c); Manhattan
Wm. Harbers (v); Prairie View
Melbourne Hardy (v); Corvallis, Ore.
Floyd R. Harness (v); Protection
Percy K. Harpster (v); Mountain Grove, Mo.
Clyde A. Harris (v); Wellington
Harry E. Harris, jr. (c); Hidalgo, Mexico
Mrs. W. E. Harrison (v); Marion
Harold Hartung (c); Junction City
Roy Harling (v); Carlyle
Russell Harvey (c); Centerville
Martin Harvey (v); Higginsville, Mo.
Maude Harwood (v); Amsterdam, Mo.
C. W. Hanson (v); Clifton
Jean Hanna (c); Clay Center
Victor G. Haury (c); Moundridge
Thornwald Hansen (v); Omaha, Neb.
Walter W. Haverstick (v); De Soto, Mo.
Wm. R. Hays (v); Pleasant Hill, Mo.
Arthur Haynes (v); Perry
Guy Hazelwonder (v); Hardin, Ill.
Howard Hazen (v); Protection
Mrs. Ada Haukenberry (c); Manhattan
Rawlins Howley (c); Traer
W. F. Hearst (v); Alma
Jno. Wm. Heckman (v);
Mount Clemens, Mich.
Otto J. Heer (v); Dubuque, Iowa
Helen Hefling (v); Burrton
Henry Heinmiller (v); Riceville, Iowa
Paul W. Heisner (v); Nebraska City, Neb.
Joseph Hemm (v); Perry
Mrs. N. H. Hendrick (v); Ogallah
Wm. E. Henry (c); Kiowa
Floyd Herr (c); Medicine Lodge
Edgel E. Hendershot (v); Omaha, Neb.
Mrs. N. H. Hendricks (v); Ogallah
Frederick E. Henning (v); Carmi, Ill.
Lester B. Hariby (v); Corvallis, Ore.
Olive Hering (c); Stafford
E. A. Herr (v); Piper
Grace Herr (c); Manhattan
Nirene Hewitt (c); Nashville
L. R. Hiatt (v); Cherokee
Frank Hickerson (c); Preston
Guy Hicks (c); Strang, Okla.
Hildred Hines (c); Scott City
Hobart Hilton (v); Des Moines, Iowa
Robert Hinman (v); Calhoun, Ill.
Chas. W. Hite (v); Red Oak, Iowa.
Arthur C. Hjelm (v); Royal, Iowa
Ruth C. Hobson (c); Liberal
E. H. Hodgson (v); Little River
Chas. Hoff (v); Kankakee, Ill.
Emil Hokanson (c); Manhattan
Ralph Holman (v); Burkburnett, Tex.
Carl Holman (v); Leavenworth
Earl Elmer Holmes (c); Severy
Donald Holmes (v); Chariton, Iowa
S. L. Holt (c); Neodesha
Clara Honeywell (c); Manhattan
Marie Hoovler (c); Medicine Lodge
S. A. Hoover (v); College Station, Ark.
Hollis R. Hope (c); Garden City
H. C. Horstick (v); Princeton
Chas. Hoskenson (c); Stafford
Russell E. Houk (c); Moran
Mrs. Carl Howard (v); Hays
C. W. Howard (c); Colby
Alfreda Honeywell (c); Manhattan
Harold C. Howe (v); Chapman
Frances J. Hoyt (c); Junction City
Arthur W. Hubbard (v); Howard City, Mich.
Lelia Mary Hughes (c); Kansas City, Mo.
Lee Edgar Hughes (v); Kansas City
James A. Hull (c); Stafford
Hazel Humbarger (c); Salina
John G. Hutton (v); Torrington, Wyo.
Lester Huseman (c); Ellsworth
Mrs. J. V. Hyatt (v); Coldwater
Fred A. Irwin (c); Manhattan
Josephine Jackman (c); Girard
J. L. Jacobson (v); Kingman
Samuel James (c); Homewood
G. T. James (c); Phillipsburg
Herbert W. Janson (v); Clay Center
R. W. Jenkins (c); Perry
Adolph G. Jensen (v); Neodesha
Homer Jester (v); Oxford
Wm. Jester (v); Sioux City
Henry T. Jinks (v); Ord, Neb.
Margaret Johnson (c); Ellsworth
Francis Johnson (v); Burlington
Esther Johnson (c); Junction City
Roy J. Johnson (v); Mason City, Iowa
Fred D. Johnson (c); Bonner Springs

HOME STUDY SERVICE STUDENTS—*continued.*

Harold Johnson (v); Norton
Geo. L. Johnson (c); Manhattan
Frances A. Johnstone (c); Manhattan
Hattie Jones (c); Bigelow
Virgie Jones (c); Hardtner
V. A. Jones (c); Palestine, Ill.
Dorothy Jones (v); Abilene
Virgil E. Jones (c); Derby
Marvin Jordan (c); Manhattan
Clyde E. Jordan (v); Eugene, Ore.
Nellie R. Jorns (c); Preston
Pearl Josephson (c); Sylvia
E. J. Jull (v); Omaha, Neb.
Eleanor Jurgens (v); Valley Falls
Emil E. Kaempfer (v); Cape Girardeau, Mo.
Eulalia F. Kaiser (c); Hillsboro
Kansas Produce Co. (v); Coffeyville
Omar H. Karns (c); Fort Scott
Chas. J. Kasper (v); Narka
Jno. F. Kassel (v); Sioux City, Iowa
J. E. Kehuk (v); Caldwell
Dewitt Keefe (v); Gering, Neb.
Bert E. Keirns (c); Downs
Lee Patrick Kelcher (v); Danbury
Chas. Kemper (v); Windsor, Mo.
Gail Kenney (c); Medicine Lodge
Theodore Kenney (v); Medicine Lodge
James W. Kennedy (c); Barnes
Gertrude M. Kern (v); Dallas, Tex.
Sarah Jane Kerr (c); Pratt
Hester Keys (c); Volland
F. E. Kidney (v); Rosedale
Russell Kifer (c); Manhattan
Jno. F. Kilgore (v); Mullinville
Perry L. Kime (v); Gashland, Mo.
Katharine Kimmel (c); Manhattan
Berk C. Kingman (v); Topeka
Phillip Kinnicott (v); Hagerman, Idaho
Kathleen Knittle (c); Manhattan
John Kjellen (c); Battle Creek, Mich.
Clarence Kleeberger (v); Omaha, Neb.
Selma Klinkerman (c); Canton
Karl Knaus (c); Manhattan
Geo. H. Knockel (v); Davenport, Iowa.
E. A. Knoth (c); Manhattan
Elsie A. Knox (c); Leon
Earl L. Koby (v); Sedgwick
Emelia Koebele (v); Burns
Alfred Kortemeier (v); St. Charles, Mo.
Frederick Kospa (v); Cuba
Jeffie Otis Kramer (c); Wichita
Harvey B. Krey (c); Zenith
Adolf J. Krehbiel (c); Geary, Okla.
Morton A. Krieger (v); Fornfelt, Mo.
Bessie Kyle (c); Osborne
Glenn Lacy (c); Medicine Lodge
Harold La Hue (v); Casper, Wyo.
Roberta Lake (c); Beloit
Otis E. Lambert (v); Kansas City, Mo.
Chas. Lamkins (v); Sawyer
Vincent Lammert (v); St. Louis, Mo.
Fred F. Lampton (v); Cherokee
Dave C. Landels (v); Boone, Iowa
Wm. H. Landes (v); Hamlin
Mrs. Ame. Landgraf (v); Garden City
David S. Landis (v); Cherryvale
Merville Larson (c); Watkins, Colo.
Lowe Lauder (c); Tyrone, Okla.
Velma Lawrence (c); Manhattan
Howard J. Lay (c); Bunkerhill
B. C. Ledbetter (v); Fort Worth, Tex.
Leroy M. Leiter (c); Macksville
Jacob T. Lemmens (v); Rock Valley, Iowa
Lewis K. Leonard (c); Solomon
Nelson Le Suer (v); Pratt
Martha Levendofsky (c); Belleville
Allen Lewis (v); Chicago, Ill.
Viola M. Lienard (c); Eskridge
Alvin G. Lindow (v); Chili, Wis.
Poy Y. Linn (c); Manhattan
Geo. W. Lint (v); Van Meter, Iowa
D. Linn Livers (v); Barnes
Will D. Lobaugh (c); Greenleaf
Martin O. Loftus (v); Tomahawk, Wis.
Fred Logeman (v); Manly, Iowa
Omar F. Loomis (v); Salem, Ill.
Russell M. Loper (v); Oelwein, Iowa
Harry Lord (v); Centerville, Iowa
Walter Louis (v); Douglass
Harry Louis (c); Medicine Lodge
Stanley R. Lovell (v); Grand Forks, N. Dak.
Hugh M. Lower (v); Mountain Grove, Mo.
John J. Lundstrom (v); El Dorado
W. L. Lux (v); Topeka
Albert H. Lux (v); Sedgwick
Harold T. Lux (v); Topeka
Lois L. Lux (v); Topeka
Ray W. Lux (v); Sedgwick
D. G. Lynch (c); Manhattan
Calvin S. Lyon (c); Faulkner
Naomi Mac Laren (c); Parsons
Bernard Macy (c); Stafford
Geneve Madden (c); Horton
Luella Madden (v); Horton
Lawrence Maddox (c); Hazelton
Amba C. Mann (v); Parsons
Virgin Marsh (c); Belleville
Mrs. Geo. Marshall (v); Basehor
Ray D. Marshall (v); Beaver City, Iowa
Helen Martin (c); Mayfield
L. M. Martin (v); Monmouth, Ill.
Carol Martin (v); Lawrence
Ruth Martin (c); Manhattan
J. E. Martin (v); Lenox, S. Dak.
Lillian Martin (c); Richfield
Frank R. Mason (v); Toledo, Iowa
Herbert Matteson (v); Pineville, Mo.
Rex A. Maupin (c); Fort Worth, Tex.
F. L. Maxey (v); Bois D'Arc, Mo.
John Maxwell (v); Burleson, Tex.
Elizabeth Mayor (c); Carthage, Ill.
Carl W. McAlear (v); Gering, Neb.
Samuel W. McAnnally (v); St. Louis, Mo.
Ernest McCabe (v); Grand Rapids, Minn.
Chas. T. McCampbell (v); Fairfield, Iowa
W. O. McCarty (c); Ames
Willard F. McKean (v); Shenandoah, Iowa.
Donald A. McConnell (v); Goff
Thos. C. McCormick (c); Ada, Okla.
James J. MacDonald (c); Brewster
Wm. McDonald (v); Peru
Chas. J. McDonald (v); Horton
Walter McGill (v); Stafford
Eugene McIntyre (c); Belleville
C. O. McIntosh (c); Glen Elder
Corrine McIntosh (c); Burns
Gladys McCrea (c); Dunavant
Margaret McLaren (c); Severance
Wm. N. McPherson (v); Scottsbluff, Neb.
Wm. J. McMahon (v); De Soto, Mo.
Edna McManis (c); Dresden
Arch J. McMichael (v); Holt's Summit, Mo.
Esther McStay (c); Downs
Geo. Meade (v); Dixon
Vernon Mead (c); Dexter
V. G. Megill (c); Elk City
Oscar Medthun (v); Rake, Iowa
Werner Mehrle (v); Cape Girardeau, Mo.
Ernest E. Mercer (c); Sedan
Albert Merrick (v); Omaha, Neb.
Ethel Meugniot (c); Wathena
G. G. Meyer (v); Basehor
Esther Meyer (c); Girard
Leonard Miers (v); Seward, Neb.
Mrs. Irene Millard (c); Miltonvale

HOME STUDY SERVICE STUDENTS—*continued.*

Beryl B. Miller (v); Alta Vista, Iowa
C. O. Miller (v); Culver
Susan Millier (c); Massina, Iowa
Albert R. Mills (v); Bentonville, Ark.
Ross Mills (v); Crystal, Okla.
Thos. Q. Mills (v); Morganfield, Ky.
Dorothy Miner (c); Macksville
Thelma Miskimen (c); Preston
Helen Mitchell (c); Topeka
James A. Mix (v); Jackson, Mich.
Lloyd Moffett (v); Corvallis, Ore.
E. Mohn (v); St. Louis, Mo.
Leon F. Montague (c); Irving
William Moore (v); Bedford, Ill.
Patrick V. Moore (v); Pratt
Robert B. Moore (v); Hiawatha
Jean Moore (c); Manhattan
Hubert F. Moore (c); Altoona
W. R. Morris (v); Colby
Louise Morse (c); Garden City
E. J. Mueller (c); Hanover
Sarada Murlin (c); Parsons
Wm. P. Murphy (v); St. Louis, Mo.
Nancy Mustoe (c); Norton
John W. Nadler (v); Gray Summit, Mo.
W. J. Nagel (v); Manhattan
Vincent W. Nass (c); Manhattan
J. H. Neal (c); Williamsburg
Garland Neighbor (c); Junction City
Chester Neiswender (c); Topeka
Arvid Nelson (c); Goodland
A. M. Nielson (v); Omaha, Neb.
Ruth Nolf (c); Chapman
Frank G. Nordhus (v); Seneca
Percy K. Norris; Norman, Okla.
Bessie K. Norton (c); Council Grove
William Noyes (v); Council Bluffs, Iowa.
Euel Northcutt (v); Anthonies Mill, Mo.
Thomas E. Oakes (v); Lincoln, Neb.
Clyde H. O'Dell (c); Pittsburg.
Carl Odor (v); Webster City, Iowa
Patrick O'Connor (v); St. Louis, Mo.
Opal Oldfield (c); Canton
Glenn W. Oliver (c); Mound City
Fred Ollstedt (v); Topeka
Nina Olmstead (c); Garber, Okla.
Hazel Olson (c); Topeka
Harold J. Olson (v); Wellsville
Marion A. Olson (v); Wausau, Wis.
Harry A. Olson (v); Wanderoos, Wis.
Jno. J. O'Neill (v); St. Louis, Mo.
Joseph O'Neill (v); Gettysburg, S. Dak.
Madison Ormsby (v); Davenport, Iowa
Julius Ovensny (v); East Bernard, Tex.
Vernon Paine (v); Admire
Hattie Pakkebier (v); Prairie View
Ethel Palenske (c); Alma
Leslie F. Parker (v); Dee, Ore.
Jno. H. Parker (c); Ottawa
M. H. Parlin (v); Leavenworth
J. M. Parrish (v); Radium
Chas. O. Parsons (v); Clearwater
Paul C. Paschal (c); Gridley
W. S. Patterson (v); Ford
Herbert Patterson (c); Carlisle, Iowa
Naola Patterson (c); Erie
James E. Payne (c); Manhattan
Nettie Pfaff (c); Beloit
Marie Pfeiffer (c); Holyrood
Blanche Pfeiffer (c); Holyrood
Gladys Perrill (c); Dwight
Harry F. Percival (v); Greensburg
H. S. Peck (v); Wellington
Lester Peck (c); Hiawatha
Forrest D. Peterson (v); Ord, Neb.
Walter Peterson (v); Shafer, Minn.
Olga Peterson (c); Waterville
Edward Petr (c); Manhattan
Sylvia Petrie (c); Pratt
John O. Phalp (v); Marion, Ill.
H. W. Phillips (v); Coffeyville
Frank Pierson (v); Fairfield, Iowa
Bertha Plumb (c); Miltonvale
Joseph Poeling (v); Woodriver, Ill.
Katherine Porter (v); Ottawa
Wm. Pratt (v); Hannibal, Mo.
Chas. T. Pratt (v); Hannibal, Mo.
O. L. Pretz (c); Manhattan
Helen Priestley (c); Kansas City
Frances L. Price (c); Paola
Chas. M. Propst (v); Marshalltown, Iowa
Eugene F. Pruett (v); Torrington, Wyo.
Dorothy Pyles (v); Tribune
J. J. Quinn (c); Salina
O. L. Rakin (v); Mountain Grove, Mo.
Walter P. Raleigh (c); Clyde
Geo. J. Raleigh (c); Clyde
A. C. Ramsey (c); Partridge
C. G. Randell (v); Marysville
Lester R. Rankin (v); Waco, Tex.
Faye Rasher (c); Solomon
Eric Rasmusson (v); Lindsborg
Hjolmer C. Rasmus (v); Chippewa Falls, Wis.
Millard Ratcliff (c); Hudson
Edward A. Rausch (v); Ft. Atkinson, Iowa
Marion Rawlins (v); Anamosa, Iowa
John Rayburn (v); St. Louis, Mo.
Paul Reade (c); Moran
Ruth E. Reed (c); Lyons
Sam Regier (v); Moundridge
D. W. Reese (c); Emporia
W. R. Reeves (v); Fort Scott
W. H. Renner (v); Rush Center
J. W. Renner (v); West Plains, Mo.
Harold Retter (v); Topeka
Sara Reiff (c); Manhattan
L. V. Rhine (c); Hartford
E. L. Rhoades (c); Manhattan
Eva Rhoades (c); Waterville, Ohio
Aileene Rhodes (c); Manhattan
Raymond Rice (c); Spokane, Wash.
James Riddle (v); Des Moines, Iowa
Hal Ridley (v); Oklahoma
Carl Riggs (c); Burns
Linus Riggs (c); Burns
C. B. Roberts (c); Manhattan
Mrs. F. M. Roberts (c); Winfield
Edith Robinson (c); Atwood
Kathryn Roderick (c); Manhattan
Gail Roderick (c); Manhattan
Lee Roe (c); Mexico, Mo.
Mary Roessener (c); Manhattan
Fred Roefke (c); Waterville
Lloyd Rogler (c); Cottonwood Falls
C. C. Romaker (c); Milton Center, Ohio
C. E. Rogers (c); Manhattan
Elsie Rother (c); Bison
Edgar A. Royce (c); Garden City
Glenn Rucker (c); Burdette
Clell A. Ruble (v); Evans, Iowa
A. B. Rumsey (c); Kiowa
Viva Runyon (c); Barclay
Gussie Runion (c); Phillipsburg
Elberta Rundle (c); Densmore
Robin E. Rush (c); Tekamah, Neb.
Charlotte Russell (c); Winfield
Ralph Russell (c); Jewell
Philip Rusteberg (v); Waterloo, Ill.
Frank Ryman (v); Independence
Frank Schabel (c); Neodesha
Harry W. Schaper (v); Mullinville
Frank Schlattman (v); Perryville, Mo.
Arnold Schmanke (c); Alma
H. W. Schmitz (c); Manhattan
Benj. Schmidt (v); De Witt, Neb.

HOME STUDY SERVICE STUDENTS—*continued.*

Leo. Schmidt (v); Alton, Ill.
Ed. Schmidt (c); Junction City
Harvey Schmidt (c); Abilene
Emma Schmidt (v); Hillsboro
A. B. Schmidt (c); Canton
F. G. Schmuck (v); Warsaw, Ill.
Harry Schneider (v); Fort Dodge, Iowa
F. W. Showalter (v); Halstead
Ralph Schoen (v); St. Louis
Wm. J. Schreibe (v); Wichita
Wm. F. Schroeder (v); Harmony, Minn.
Charles Schroeder (v); Gem
Paul Schulte (c); Pittsburg
Alonzo Schultz (v); Minneapolis, Minn.
Jno. Schulte (v); St. Louis, Mo.
Lena P. Schulthess (c); Manhattan
Geo. Schumer (v); Evanston, Ill.
Mina Schwindt (c); Bison
Louis Scray (v); De Pere, Wis.
Winfield Scott (c); Topeka
Lee Scott (c); Pleasanton
Hazel Scott (c); Rosalia
Flora L. Scott (c); Waterville
Lewis Scott (c); Pittsburg.
Lester Sellers (c); Great Bend
Carl Seydell (c); Manhattan
Corlia V. Shaw (c); McPherson
Cora Shanks (c); Medicine Lodge
James Sharp (v); Clarkton, Mo.
Ethel Shea (c); Medora
W. R. Sheff (v); Effingham
Chas. Sheldon (c); McLouth
P. J. Schemayne (v); Binger, Okla.
Mrs. B. A. Shermer (v); Valley Falls
Mrs. J. L. Shermer (v); Valley Falls
Hugh Short (v); St. Joseph, Mo.
Eva Shroyer (c); Miltonvale
Jno. K. Shuger (v); Marengo, Iowa
Addie Siebert (c); Dundee
Mary Siegert (v); Basehor
Arlo D. Sigman (v); St. Louis, Mo.
Byron H. Sjoberg (c); Inman
Bernice Sjoberg (c); Inman
Dezzie Irene Simpson (c); Langdon
Nels K. Simonsen (v); Newell, Iowa
Dennis Simpson (c); Severy
D. S. Simonson (v); Anthony
John Simpson (v); Salina
Elsie Simmonds (c); Wathena
Percy Sims (c); Little River
Ira Sipes (v); Lohrville, Iowa
Jack W. Sinclear (v); Walnut
Harry Skoag (c); Corbin
Evert Slighton (v); St. Louis, Mo.
R. J. Silkett (c); Manhattan
Caroline Sloop (c); Nortonville
Edgar W. Small (v); Cut Bank, Mont.
W. R. Smith (v); Huron
Mrs. C. A. Smith (c); Raymond
Francis G. Smith (c); Marshall, Okla.
J. W. Smith (c); Manhattan
Alva Smith (v); Rexford
Halbert C. Smith (v); Evanston, Ill.
Guy C. Smith (c); Great Bend
Joe L. Smith (c); Garden City
R. O. Smith (v); Seward
J. Royalton Smith (c); Manhattan
Ernest Sonnonberg (c); Council Grove
A. L. Southworth (v); Ashland, Va.
Fred C. Soutter (c); Junction City
Victor R. Snow (v); Sibley, Iowa
Linn Snyder (c); La Cygne
Ivol Snyder (v); Gooding, Idaho
John C. Spence (v); Evanston, Ill.
Thos. G. Spring (c); Cottonwood Falls
Luther Stafford (c); Medicine Lodge
Herbert Stambaugh (v); Ashland, Neb.
C. H. Stance (v); Bethel
Theron J. Stames (c); Parsons
Florence Stauffer (c); Manhattan
Cathryn Stebbins (c); Junction City
Charles H. Steinsieck (v); Waterloo, Ill.
Lillian Stewart (c); St. Joseph, Mo.
Newton Stewart (c); Vermillion
Mary Stewart (c); Burns
Anna Stockelberg (c); Gunnison, Colo.
Gladys Stocker (c); Concordia
G. A. Stiles (c); Anthony
Irving Still (v); Fremont, Neb.
Earl Stilwell (v); Mitchell, Neb.
Glennis Stone (c); Burrton
Warren Stone (c); Manhattan
Ethel Storer (v); Alton
Ralph Stover (v); Iola
Hazel Strahan (v); Smithville, Mo.
Geo. Studley (v); Rolla, Mo.
Robert Stultz (c); Manhattan
Alfred L. Stump (v); Naches City, Wash.
Samuel Sullivan (v); Cape Girardeau, Mo.
Helen Sullivan (c); Logan
Elmer Swanson (v); South Park, Minn.
Mildred Swenson (c); Manhattan
Clayton Taft (v); Des Moines, Iowa
James Taylor (c); Manhattan
Mrs. Bert Taylor (v); Derby
Tom S. Taylor (c); Columbus
Perry Teaford (v); Norton
E. H. Teagarden (v); Nickerson
Peter F. Tempus (v); Independence, Iowa
Louise Thacher (c); Turon
Geo. Tharp (v); Wahoo, Neb.
Donald Thayer (c); Hesper, Colo.
Leonard Theno (v); Kansas City
Esther Thoes (c); Alma
Myrtle Thoes (c); Alma
Edna Thomas (c); Manhattan
Albert Thomas (c); Manhattan
Eugene Thompson (v); Salina
C. A. Thompson (c); Mulvane
Josephine Thorn (c); Beattie
Meryl Thornburg (c); Manhattan
Noel Thornhill (c); Protection
Carlyle Thornton (c); Lebanon
Daniel Thurman (v); Mt. Vernon, Mo.
Mrs. C. C. Tibbets (v); Blue Rapids
Myrtle Timbel (c); Manhattan
Ernest B. Tinklin (c); Corning
Gertrude Tobias (c); Riley
K. M. Topping (c); Manhattan
Elbert L. Towne (v); Hot Lake, Ore.
Paul Travis (c); Manhattan
Lorna Troup (c); Abilene
Jno. Tucker (v); Perryville, Mo.
Geo. Turnbull (v); Medicine Lodge
Myrtle Turner (c); Atwood
Zelma Turner (c); Sabetha
Rowena Turner (c); Chanute
Ralph Turner (v); McAlester, Okla.
Henry Tuttle (v); Florence, Neb.
Ruth Tuxhorn (c); Inman.
Wm. Vanderstay (v); Florence, Neb.
Ethel Van Gilder (c); Manhattan
Mrs. E. E. Van Horn (c); Nortonville
Grace Van Tries (c); Beloit
Mabel Van Tires (c); Wellsville
Rebecca Van Verth (c); Baileyville
Manuel Valde (c); Manhattan
Bernard L. Varner (v); Wichita
Henry Vassenkemper (v); Portage Des Sioux, Mo.
Karl Vasicek (v); Mason City, Iowa
Beulah Vaughan (c); Chester, Neb.
Louis Vinke (c); Manhattan
Henry Volk (v); Des Moines, Iowa
Herbert Vogt (v); Fort Lyon, Colo.
Ferdinand Voiland (c); Topeka
Francis Wadley (c); Wichita
Edward Wagner (v); Stratford, Wis.
Irvin Wahlers (v); Stover, Mo.

HOME STUDY SERVICE STUDENTS—*concluded.*

L. C. Waits (v); Cassoday
Arthur R. Waits (c); Cassoday
Lila Waler (c); Canton
Roy Walihan (v); St. Louis, Mo.
Andrew Walsh (v); Peoria, Ill.
Jno. Walters (v); Perryville, Mo.
Thelma Walters (c); Elk City
Samuel Warner (v); Lowry City, Mo.
John Washburn (v); St. Joseph, Mo.
Harold Washington (c); Russell Springs
Ruth Watson (c); Burns
Emery Watson (c); Barnard
Virginia Watson (c); Ash Grove, Mo.
T. A. Waugh (v); Superior, Neb.
Arthur Weber (c); Manhattan
W. W. Weidlein (v); Longton
Carl Weisbrod (v); Des Moines, Iowa
Clarence Welborn (v); Des Moines, Iowa
Arthur Wendt (v); Inman
O. H. Werner (c); Anthony
Gladys Worts (c); Beloit
Rupert K. Wey (c); Wichita
Mrs. Hazel Whedon (c); Lambert, Mont.
Francis Wherry (c); Jewell
Elwyn Wherry (c); Jewell
Alberta White (c); Canton
Frances Whitmire (c); Milan
A. F. Whisnaut (c); Riley
Maude Wicker (c); Herington
Maude Wiershing (c); El Dorado
Jno. Wilkinson (v); Mineral Wells, Tex.
John Wilkins (c); Kansas City
Dwight Williams (v); Iola
Joeffrey H. Williams (v); Lake City, Ark.
Ivor Williams (v); Lakin
J. M. Williams (c); Osage City
Carl Willis (v); Horton
Thomas Willoughby (v); Pittsburg
Lyman Wilmot (v); Hiawatha
H. L. Wilson (v); Belleville
Albert Wilson (v); Cedar Rapids, Iowa
Hazel Wilson (c); Manhattan
Ernest Witt (v); Dubuque, Iowa
Clyde Witter (c); Franklin
Edith Wiley (v); Gorin, Mo.
Carl Wimmer (v); Protection
Paul Wing (v); Denver, Colo.
Wallace Wolverton (c); Holton
D. L. Wooley (v); Kansas City
P. B. Wood (v); Elmdale
T. M. Wood (v); Keats
Mrs. Maud Woodard (v); Oskaloosa
Oscar Woody (c); Lincoln
E. L. Worner (v); Netawaka
E. W. Wren (v); Humboldt
A. M. Wright (c); Valley Center
Thos. Wright (v); Fayette, Mo.
C. L. Wright (v); Larned
E. E. Wykoff (v); Modoc
Chester Wyland (v); Kensington
Roy Yeadon (v); Berwin, Neb.
Hazel Zahn (c); Seneca
Iscah Zahn (c); Seneca
Mary Zehnder (c); Lancaster
Ralph Zicafoose (v); McCook, Neb.
H. H. Zimmerman (v); Cleburne
Carl Zohner (v); Penokee
Carl W. Zuege (v); Haigler, Neb.
J. A. Zuibarth (c); Manhattan

Study Center Students

Cecil Allwardt (c); Alma
Ruth Anderson (c); Independence, Mo.
F. N. Banister (c); Kansas City, Mo.
Chas. A. Barrett (c); Kansas City, Mo.
F. W. Bernard (c); Kansas City, Mo.
Wallace M. Brinton (c); Kansas City, Mo.
Fern O. Bonney (c); Concordia
L. L. Bowen (c); Kansas City, Mo.
J. G. Brune (c); Independence, Mo.
Herbert V. Campbell (c); Kansas City, Mo.
Myrtella Capron (c); Alma
Mattie M. Classen (c); Concordia
Catherine Collins (c); Kansas City
G. W. Davis (c); Kansas City, Mo.
Josephine Davis (c); Morganville
V. H. Davidson (c); Concordia
Jean Donalson (c); Alma
Frankie Doty (c); Kansas City
W. L. Eastwood (c); Kansas City, Mo.
Josephine Erickson (c); Kansas City
Anna Freihofer (c); Kansas City
Mary Gile (c); Concordia
J. E. Guisinger (c); Kansas City, Mo.
Louise Hackborn (c); Kansas City.
Ella Hall (c); Kansas City.
Ethel Harris (c); Kansas City
Lo Visa Hastings (c); Alma
Fred A. Hein (c); Alma
A. V. Hill (c); Kansas City
C. D. Hogiefe (c); Kansas City, Mo.
Curtis A. Hunter (c); Eastwood Hills, Mo.
J. W. Joslyn (c); Alma
Irene Ketterman (c); Alma
G. R. Kirk (c); Kansas City, Mo.
Johanna Kugel (c); Kansas City.
C. A. Larson (c); Kansas City, Mo.
S. J. Lasley (c); Kansas City, Mo.
E. R. Lewis (c); Kansas City
A. W. Lietz (c); Alma
Gladys Looney (c); Concordia
W. M. McCabbin (c); Kansas City, Mo.
Hazel McCall (c); Concordia
Belle McConnell (c); Kansas City
G. F. McGee (c); Kansas City, Mo.
Anna McLean (c); Concordia
Gladys Martin (c); McFarland
Claire Martin (c); McFarland
R. O. Mericle (c); Kansas City, Mo.
D. V. Middleton (c); Liberty, Mo.
W. D. Miller (c); Kansas City, Mo.
Frieda Mogge (c); Alma
Wm. Moore (c); Kansas City, Mo.
J. B. O'Donnell (c); Kansas City, Mo.
Geo. O'Donnell (c); Kansas City, Mo.
Irene Pratt (c); Concordia
H. M. Penn (c); Kansas City
J. B. Randolph (c); Kansas City, Mo.
Geo. M. Reeves (c); Kansas City, Mo.
J. E. Reeves (c); Kansas City, Mo.
Hattie Rotert (c); Kansas City
C. Fred Roy (c); Kansas City
Viola Schlender (c); Concordia
Gertrude Sexsmith (c); Concordia
Mrs. W. E. Sheffer (c); Concordia
Mr. W. E. Sheffer (c); Concordia
Fannie R. Slagill (c); Kansas City
Venus Spencer (c); Concordia
Leona Spurgeon (c); Kansas City
Thos. Stratton (c); Kansas City, Mo.
Ruby A. Thomas (c); Concordia
E. D. Thomas (c); Kansas City
Helen Louise Thompson (c); Kansas City, Mo.
Fred W. Toomey (c); Kansas City, Mo.
Blanche Townsdin (c); Concordia
Esther Ungar (c); Kansas City
Gertrude Wall (c); Concordia
Harvey Watkins (c); Kansas City, Mo.
Charlotte Weaver (c); Concordia
D. M. Webb (c); Kansas City, Mo.
Carrie Whipp (c); Concordia
Wiley Williamson (c); Kansas City, Mo.
Mary M. Wynne (c); Kansas City, Mo.
Frieda Zeh (c); Kansas City
Beulah Zwansiger (c); Alma

Student Organizations

The Students' Self-governing Association

OFFICERS

Charles Clyde McPherson, *President*
Timothy J. Foley, *Vice President*
Alice DeWitt, *Secretary*
Truman Olvard Garinger, *Treasurer*

REPRESENTATIVES, THE EXECUTIVE COUNCIL.

Senior Class:
Eugene Eric Huff
Truman Olvard Garinger
Junior Class:
Opal Seeber
Robert Cleveland Spratt
Sophomore Class:
Emmett Graham
Lon Wesley Grothusen
Freshman Class:
Ione Aspey
Meryl Barnhisel
Men's Pan-Hellenic Council:
Kent Byron Dudley
Women's Pan-Hellenic Council:
Edith Fairchild
Inter-Society Council:
Luella Sherman
Harold Howe
Y. W. C. A.:
Alice DeWitt
Y. M. C. A.:
Charles Francis Hadley
Girls' Loyalty League:
Clara Evans
"K" Fraternity:
Ivan Riley
W. A. A.:
Alice Marston
Federation Coöperative Clubs:
Charles Willcox Howard
The Vocational School:
Paul Jones Briggs

COMMITTEES

School Spirit:
R. C. Spratt
Donald Corby
Michael Ptacek
Finance:
Kent Dudley
George Winters
Victor Kirk
David E. Davis
Discipline:
Harold Howe
C. W. Howard
Agnes Ayers
Florence Barnhisel
James Albright
Social Affairs:
E. E. Huff
Edith Fairchild
Lillian Rommel
Henry I. Richards
Marion Smith
Calendar:
Clara Evans
Joe C. Wallace
L. W. Grothusen
Florence Stauffer
Penelope Burtis
Points:
Ivan Riley
Irene Maughlin
Ruth Kittell
James Leonard
Lester Means
Collegian Reporter:
Opal Seeber

The College Band

Earl Beverly Amos
Harry Leigh Baker
Joseph Ersol Bleger
Glen Marvin Case
Hubert Lee Collins
Clarence Dow Compton
Merriam Elmer Cook
Donald K. Corby
Leslie Hehner Dudey
Forest Noble Erwin
Harold P. Gaston
Charles Lewis Gunn
Joe Haines
William James Hartgroves
Richard Michael Hartigan
Herbert Fred Hemker
Brom Dwight Hixon
Leland Stanford Hobson
Theodore Thomas Hogan
Eric Eugene Huff
William Illingworth
William Harold Koenig
Julius Henry Kolbus
Emmett Engle Kraybill
James Waggoner Lansing
John Clyde Lentz
Robert Siegrist Love
Wayne McClelland
Harold Hartwell McNeeley
Raymond Wadsworth Martin
Charles Edgar Moorman
Richard Allen Moorman
George DeVore Morris
Dewey Newcomb
Irwin Leslie Peffley
William Rankin, jr.
Ralph Burton Ricklefs
Arthur Howard Riley
Walter Thomas Rolfe
C. Morton Rust
Lester Ralph Sellers
Marion Welsh Smith

THE COLLEGE BAND—*concluded.*

William Donald Smith
Alfred Leonard Stockbrand
William Wesley Trego
Robert Lee Welton
Lloyd Venice Wimer
George Hugh Winters
Clell Burns Wisecup
Lawrence Ewalt Woodman

The Second College Band

Roy Bainer
George Kenneth Chew
William Dalton
Allison Boyd Edwards
Asa Herbert Ford
Elmo Ford
Otis Fred Fulhage
Roy Preston Garrett
Walter Diedrick Hemker
Carl McKinley Henson
Herman George Hockman
Alfred Edgemont Meek
William Hosea Messenger
Keith Walter Miller
Ralph Parkinson Moyer
Durward Belmont Rising
Thomas Ewing Rodger
Elbridge Webster Symns
Roy Williams
Paul Raymond Wise

The College Orchestra

William George Altmari
Joseph Ersol Beyer
Robert Lowell Black
Marguerite Brooks
John Burton Elliot
Robert Bruce Gordon
Helen Mabel Hannen
Ethel Hassinger
Herbert Hemker
Rudolph Louis Hensel
Eugene Eric Huff
Leland Stanford Hulshizer
Herbert Lee Kammeyer
Dorothy Knittle
Raymond Wadsworth Martin
Valley Maupin
Charles Edgar Moorman
George DeVore Morris
Walter Thomas Rolfe
Mabel Russell
C. Morton Rust
Herbert Henry Schwardt
Robert Graham Scott
Lester Ralph Sellers
Roger Cletus Smith
Elizabeth Van Ness
Robert Lee Welton
Clell Burns Wisecup
Lawrence Woodman

The Men's Glee Club

Harold Coleman Ash
Joseph Daniel Buchman
George Hoffman Bush
Lawrence Byers
Glen Marvin Case
Grovener Charles
Paul Clark
Charles Haynes Cloud
George Stuart Davis
Donald Mann Diefendorf
Harold Paul Gaston
Albert Arthur Goering
Herbert Goering
Leslie Howard Griswold
Nelson Hornish
Bert Howell
Leland Stanford Hulshizer
Forest Noble Irwin
Arthur Johnson
Walter Alfred Johnson
Herbert Lee Kammeyer
Victor Kirk
Fred Lampton
William Joseph Mathias
Lester Honnel Means
Joseph Eugene Thackry
Hobart Scott VanBlarcom
Bruce Dean Whitney
John Burton Elliot, *Accompanist*

The Women's Glee Club

Ramona Abrams
Eunice Anderson
Agnes Ayers
Josephine Boggs
Marguerite Brooks
Jessie Burguin
Fern Case
Margaret Corby
Georgia Daniels
Myrtle Dubbs
Anna Enns
Evelyn Fairbanks
Ruth Floyd
Clara Higdon
Eunice Hobson
Clara Howard
Helen Howell
Marjorie Hubner
Laurene Kuns
Maud Lahr
Mary Leeper
Roxie Meyers
Lucille Newby
Ruth Pasley
Ernestine Pinkerton
Ruth Rathbone
Margaret Reasoner
Mary Russell
Orpha Russell
Ruth Scott
Geraldine Shane
Luella Sherman
Gretchen Voiland
Arilla Wadsworth
Leola Wallace
Marie Willis
Mable Murphy, *Accompanist*

NAME INDEX*

* Names of students may be found by referring to pages 351, 386, and 395.

GENERAL INDEX

□