# KANSAS STATE AGRICULTURAL COLLEGE BULLETIN

VOLUME IX | JUNE 1, 1925 | NUMBER 5


# CATALOGUE

## SIXTY-SECOND SESSION, 1924-'25

WITH ANNOUNCEMENTS FOR 1925-'26

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Published by the College


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# The College Calendar

## SUMMER SCHOOL, 1925

June 1, Monday.—Registration of students for Summer School begins at 8 a. m.
June 1, Monday.—Examinations for admission.
June 1 to Aug. 1, Monday to Saturday.—Summer School in session, nine weeks.
June 15, Monday.—Preliminary reports on masters' theses are due.
July 15, Wednesday.—Abstracts of masters' theses are due.
July 28, Tuesday.—Masters' theses are due.
Aug. 1 to 20, Saturday to Saturday.—Second term of Summer School in session.
August 15, Saturday.—Reports of all grades for Summer School due in registrar's office.

## FIRST SEMESTER, 1925-'26

Sept. 11, Friday.—All members of the instructional force on duty.
Sept. 12, Saturday.—Meeting of assigners with committee on schedule at 2 p. m.
Sept. 12, Saturday.—Meeting of assigners with deans at 3 p. m.
Sept. 14, Monday.—Admission and registration of students begin at 8 a. m.
Sept. 14, Monday.—Examinations for admission.
Sept. 15, Tuesday.—Housekeepers' Course begins; registration at 8 a. m.
Sept. 16, Wednesday.—Registration of students closes at 11 a. m.
Sept. 16, Wednesday.—Opening convocation, 11 a. m. to 12 m.
Sept. 16, Wednesday.—*All classes meet according to schedule, beginning at 1 p. m.
Sept. 28, Monday.—Special courses for auto mechanics, tractor operators, machinists, blacksmiths, foundrymen, and carpenters begin.
Oct. 10, Saturday.—Examinations to remove conditions.
Oct. 17, Saturday.—Scholarship deficiency reports to students and deans are due.
Nov. 14, Saturday.—Midsemester scholarship deficiency reports to students and deans are due.
Nov. 25, Wednesday.—Thanksgiving vacation begins at 12 m.
Nov. 28, Saturday.—Thanksgiving vacation closes at 6 p. m.
Dec. 1, Tuesday.—Preliminary reports on masters' theses are due.
Dec. 19, Saturday.—Housekeepers' Course closes at 12 m.
Dec. 19, Saturday.—Winter vacation begins at 6 p. m.
Jan. 2, 1926, Saturday.—Winter vacation closes at 6 p. m.
Jan. 4, Monday.—Special courses for auto mechanics, electricians, tractor operators, machinists, blacksmiths, foundrymen, and carpenters begin.
Jan. 8, Friday.—Abstracts of masters' theses are due.
Jan. 22, Friday.—Masters' theses are due.
Jan. 22 to 30, Friday to Saturday.—Examinations at close of semester.
Jan. 30, Saturday.—First semester closes at 11 a. m.
Feb. 1, Monday.—Semester deficiency reports to students and deans are due.

## SECOND SEMESTER, 1925-'26

Feb. 1, Monday.—Meeting of assigners with committee on schedule at 2 p. m.
Feb. 1, Monday.—Examinations for admission.
Feb. 2, Tuesday.—Admission and registration of students begin at 8 a. m.
Feb. 2, Tuesday.—Housekeepers' Course begins; registration at 8 a. m.
Feb. 4, Thursday.—*All classes meet according to schedule, beginning at 8 a. m.
Feb. 8 to 13, Monday to Saturday.—Farm and Home Week.
Feb. 13, Saturday.—Reports of all grades for first semester due in registrar's office.
Feb. 22, Monday.—Holiday, Washington's Birthday.
Feb. 27, Saturday.—Examinations to remove conditions.
Mar. 6, Saturday.—Scholarship deficiency reports to students and deans are due.
Mar. 6, Saturday.—Farmers' Short Course and Creamery Short Course close at 12 m.
April 1, Thursday.—Preliminary reports on masters' theses are due.
April 1, Thursday.—Easter vacation begins at 6 p. m.
April 3, Saturday.—Midsemester scholarship deficiency reports to students and deans are due.
April 5, Monday.—Easter vacation closes at 6 p. m.
April 15, Thursday.—Announcements of elections of seniors to Phi Kappa Phi.
May 10, Monday.—Abstracts of masters' theses are due.
May 11, Tuesday.—Housekeepers' Course closes at 12 m.
May 19 to 26, Wednesday to Wednesday.—Examinations for seniors.
May 26, Wednesday.—Masters' theses are due.
May 26 to June 2, Wednesday to Wednesday.—Examinations at close of semester.
June 3, Thursday.—Commencement Day.
June 4, Friday.—Semester deficiency reports to students and deans are due.
June 17, Thursday.—Reports of all grades for second semester due in registrar's office.

* 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 five dollars is charged those who are assigned after the time set for close of registration unless an acceptable excuse is offered.

SUMMER SCHOOL, 1926

June 7, Monday.—Registration of students for Summer School begins at 8 a. m.
June 7 to Aug. 7, Monday to Saturday.—Summer School in session, nine weeks.
June 22, Tuesday.—Preliminary reports on masters' theses are due.
July 22, Thursday.—Abstracts of masters' theses are due.
Aug. 4, Wednesday.—Masters' theses are due.
Aug. 21, Saturday.—Reports of all grades for Summer School due in registrar's office.

FIRST SEMESTER, 1926-'27

Sept. 13, Monday.—Admission and registration of students begin at 8 a. m.
Sept. 13, Monday.—Examinations for admission.
Sept. 15, Wednesday.—Registration of students closes at 11 a. m.

## The State Board of Administration*

GOVERNOR BEN S. PAULEN, *ex officio Chairman*
LACEY M. SIMPSON H. E. PEACH C. S. HUFFMAN
FRANK H. ROBERTS, *Secretary*

T. J. O'NEIL, *Business Manager*
J. W. HOWE, *Assistant Business Manager*
G. W. MYERS, *Assistant Business Manager*

## The State Board of Regents†

| | | |
|---|---|---|
| W. Y. MORGAN | CHARLES HARGER | C. W. SPENCER |
| C. B. MERRIAM | GEORGE H. HODGES | B. C. CULP |
| W. J. TODD | EARLE W. EVANS | MRS. J. S. PATRICK |

* In control to July 1, 1925.
† In control beginning July 1, 1925.

# Administrative Officers of the College

| | |
|---|---|
| President | WILLIAM M. JARDINE‡ |
| Acting President, Dean of the Division of Agriculture, and Director of the Agricultural Experiment Station | F. D. FARRELL |
| Vice President, and Dean of the Division of General Science | J. T. WILLARD |
| Dean of the Division of Veterinary Medicine | R. R. DYKSTRA |
| Dean of the Division of Engineering and Director of the Engineering Experiment Station | R. A. SEATON |
| Dean of the Division of Home Economics | MARGARET M. JUSTIN |
| Dean of the Division of College Extension | H. J. UMBERGER |
| Acting Dean of the Division of Agriculture, and Acting Director of the Agricultural Experiment Station | L. E. CALL |
| Chairman of the Graduate Council | J. E. ACKERT |
| Dean of Women | MARY P. VAN ZILE |
| Dean of the Summer School | E. L. HOLTON |
| Registrar | JESSIE McD. MACHIR |
| Librarian | ARTHUR B. SMITH |
| Custodian of Buildings and Grounds | G. R. PAULING |

‡ Absent on leave after February 28, 1925; resigned June 30, 1925.

# Officers of Instruction and Administration

## PRESIDENT

WILLIAM MARION JARDINE,[1] B. S. A., LL. D., President of the College (1910, 1918-June 30, 1925).

B. S. A., Utah Agricultural College, 1904; LL. D., Campbell College, 1916.

FRANCIS DAVID FARRELL, D. Agr., Acting President (1918; March 1, 1925)*; Dean of Division of Agriculture (1918); Director of Agricultural Experiment Station (1918).

B. S. Utah Agricultural College, 1907; D. Agr. University of Nebraska, 1925.
** A 30; 1515 Leavenworth.

## PROFESSORS

JOHN DANIEL WALTERS, M. S., A. D., Professor of Architecture, Emeritus (1877, 1917).

M. S., K. S. A. C., 1883; A. D., ibid., 1908. E 214; 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., K. S. A. C., 1883; M. S., ibid., 1886; Sc. D., ibid., 1908. A 47; 1014 Houston.

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., K. S. A. C., 1893; M. S., ibid., 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; 615 Humboldt.

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; 1441 Laramie.

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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 time 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—Chemistry Annex No. 2.
E—Engineering Hall.
F—Fairchild Hall (Library).
G—Education Hall.
H—Horticultural Hall.
I—Illustrations Hall.
K—Kedzie Hall (Printing).
L—Calvin Hall (Home Economics).
M—Auditorium.
MA—Music Annex.
N—Nichols Gymnasium.
R—Farm Machinery Hall.
S—Engineering Shops.
T—Thompson Hall (Cafeteria).
V—Veterinary Hall.
W—Chemistry Annex No. 1.
X—Dairy Commission Building.

1. Absent on leave, March 1 to June 30, 1925; resigned June 30, 1925.

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.

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.

EDWIN LEE HOLTON, A. B., Professor and Head of Department of Education (1910, 1913); Dean of Summer School (1910, 1918).
A. B., Indiana University, 1904. G 28A; 217 N. Fourteenth.

ROY ANDREW SEATON, M. S., Dean of Division of Engineering (1904, 1920); Director of the Engineering Experiment Station (1904, 1920).
B. S., K. S. A. C., 1904; M. S., ibid., 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; 1733 Anderson.

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). Acting Dean, Division of Agriculture (1907; April 1, 1925); Acting Director, Agricultural Experiment Station (1907; April 1, 1925).
B. S. in Agr., Ohio State University, 1906; M. S., ibid., 1912. Ag 214; 223 N. Fourteenth.

GEORGE ADAM DEAN,[3] M. S., Professor and Head of Department of Entomology (1902, 1913); Entomologist, Agricultural Experiment Station (1902, 1913).
B. S., K. S. A. C., 1895; M. S., ibid., 1905. F 52; 1000 Leavenworth.

ROBERT KIRKLAND NABOURS, Ph. D., Professor and Head of Department of Zoölogy (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; 401 Denison.

RALPH RALPH DYKSTRA, D. V. M., Dean of 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.

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3. Absent on leave till Feb. 1, 1925.

MICHAEL FRANCIS AHEARN, M.S., Professor and Head of Department of Physical Education, and Director of Athletics (1904, 1920).
B. S., Massachusetts Agricultural College, 1904; M. S., K. S. A. C., 1913.
N 35; 104 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 30; 1723 Leavenworth.

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., K. S. A. C., 1908; M. E., ibid., 1916. S 62; 1722 Laramie.

SAMUEL CECIL SALMON, M.S., Professor of Farm Crops (1913, 1917).
B. S., South Dakota Agricultural and Mechanical College, 1907; M. S., K. S. A. C., 1923.
Ag 82; 1648 Leavenworth.

WALTER HORACE BURR, B.S., Professor of Sociology (1914, 1921).
B. S., K. S. A. C., 1920. A 74; 1811 Humboldt.

HARRY JOHN CHARLES UMBERGER,[7] B.S., Dean of Division of College Extension (1911, 1919); Director of College Extension (1911, 1919).
B. S., K. S. A. C., 1905. A 33; 1412 Leavenworth.

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., K. S. A. C., 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., K. S. A. C., 1906; D. V. M., ibid., 1910; B. S. in Agr., ibid., 1918.
Ag. 15; 343 N. Fourteenth.

RAY IAMS THROCKMORTON, M.S., Professor of Soils (1911, 1918).
B. S. in Agr., Pennsylvania State College, 1911; M. S., K. S. A. C., 1922.
Ag 216; 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; 1923 Leavenworth.

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. Ag 151; 321 N. Sixteenth.

HALLAM WALKER DAVIS, A.M., Professor of English (1913, 1918); Head of Department of English (1913, 1921).
A. B., Indiana University, 1909; A. M., Columbia University, 1913.
K 52; 1727 Fairview.

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* Absent on leave May 1, 1925, to June 30, 1926.

7. In coöperation with the U. S. Department of Agriculture.

ARAMINTA HOLMAN,[4] B.S., Professor and Head of Department of Applied Art (1913, 1918).

Graduate, New York School of Fine and Applied Art, 1912; B. S., Columbia University, 1922. A 67; 327 N. Fifteenth.

VIVAN LEWIS STRICKLAND, A.M., Professor of Education (1917, 1922).

A. B., University of Nebraska, 1906; A. M., ibid., 1915. G 28; 1512 Leavenworth.

JAMES PARK CALDERWOOD, M.E., M.S., Professor and Head of Department of Mechanical Engineering (1918, 1922); 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; 211 N. Eighteenth.

CYRUS VANCE WILLIAMS, B.S. (in Agr.), A.M., Professor of Vocational Education (1920).

B. Ed., (Peru) Nebraska State Normal School, 1909; A. M., University of Nebraska, 1910; B. S. in Agr., College of Agriculture, ibid., 1919. G. 29; 611 Humboldt.

WILLIAM HIDDLESON ANDREWS, Ph.D., LL.D., Professor of Education (1906, 1920).

A. B., University of Chicago, 1900; M. S., K. S. A. C., 1919; Ph. D., University of Chicago, 1923; LL. D., College of Emporia, 1921. G 28B; 630 Moro.

CHARLES OSCAR SWANSON, M. Agr., Ph.D., Professor and Head of Department of Milling Industry (1906; July 1, 1923).

A. B., Carleton College, 1899; M. Agr., University of Minnesota, 1905; Ph. D., Cornell University, 1922. Ag 119; 1640 Fairview.

IVOR VICTOR ILES, A.M., Professor of History and Civics (1911, 1920).

A. B., University of Kansas, 1905; A. M., ibid., 1905. F 4; 1725 Fairchild.

JOSIAH SIMSON HUGHES, Ph.D., Professor of Chemistry (1910, 1920).

B. S., Ohio Wesleyan University 1908; M. S., ibid., 1910; A. M., Ohio State University. 1910; Ph. D., ibid., 1917. C. 41; 333 N. Fifteenth.

ROBERT WARREN CONOVER, A.M., Professor of English (1915, 1920).

A. B., Wesleyan University, 1911; A. M., ibid., 1914. K 52; 1409 Anderson.

JOHN CHRISTIAN PETERSON, Ph.D., Professor of Education (1917, 1920).

A. B., University of Utah, 1913; Ph. D., University of Chicago, 1917. A 56; 1330 Laramie.

FREDERICK ERVING COLBURN, Professor and Head of Department of Illustrations (1919, 1920).

I; 322 N. Seventeenth.

HERBERT FREDERICK LIENHARDT, V.M.D., Professor and Head of Department of Pathology (1917, 1920).

V. M. D., University of Pennsylvania, 1916. V 58; 1118 Bertrand.

GEORGE ELLSWORTH RABURN, M.S., Professor of Physics (1910, 1920).

A. B., University of Michigan, 1907; M. S., ibid., 1913. C 34; College Heights.

4. Absent on leave, Feb. 1 to June 1, 1925.

LOUISE PHILLIPS GLANTON,[5] A. M., Professor and Head of Department of Clothing and Textiles (1920).
B. S., Columbia University, 1905; A. M., ibid., 1917. L 56; 1212 Fremont.

ROBERT JOHN BARNETT, M. S., Professor of Horticulture (1920).
B. S., K. S. A. C., 1895; M. S., ibid., 1911. H 33; 512 N. Ninth.

HARRY BRUCE WALKER, C. E., Professor and Head of Department of Agricultural Engineering (1914, 1921); Agricultural Engineer, Engineering Experiment Station (1921).
B. S. in C. E., Iowa State College, 1910; C. E., ibid., 1920. E 216; 1728 Fairchild.

MARY THERESA HARMAN, Ph. D., Professor of Zoölogy (1912, 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 Animal Husbandry, in Charge of Advanced Judging (1918, 1921).
B. S. A., Cornell University, 1911. Ag 5; 906 Osage.

EUSTACE VIVIAN FLOYD, B. S., Professor of Physics (1911, 1921).
B. S., Earlham College, 1903. C 34; 1451 Laramie.

WALDO ERNEST GRIMES, Ph. D., Professor and Head of Department of Agricultural Economics (1913, 1921).
B. S., K. S. A. C., 1913; Ph. D., University of Wisconsin, 1923.
Ag 350; 1821 Leavenworth.

JOHN HUNTINGTON PARKER,[7] M. S., Professor of Crop Improvement (1917, 1921).
B. S. in Agr., University of Minnesota, 1913; M. S. in Agr., Cornell University, 1916.
Ag 302; 1728 Fairview.

HOWARD TEMPLETON HILL, J. D., Professor and Head of Department of Public Speaking (1920, 1922).
B. S., Iowa State College, 1910; J. D., University of Chicago, 1917.
G 55; 1020 Leavenworth.

IRA PRATT,[6] Professor and Head of Department of Music (1921).
M 30; 1320 Fremont.

ERIC ENGLUND, M. S., Professor of Agricultural Economics (1921, 1922).
B. S., Oregon Agricultural College, 1918; A. B., University of Oregon, 1919; M. S., University of Wisconsin, 1920. Ag 351; 615 Humboldt.

NOBLE WARREN ROCKEY, A. M., Professor of English (1921).
A. B., Ohio State University, 1905; A. M., ibid., 1916. K 52; 514 N. Manhattan.

EDWARD GUERRANT KELLEY, M. S., Professor of Entomology, Division of College Extension (1918, 1922).
B. S., University of Kentucky, 1903; M. S., ibid., 1904. F 52; 1621 Humboldt.

HOWARD W. BRUBAKER, Ph. D., Professor of Chemistry (1913, 1922).
B. S., Carleton College, 1899; Ph. D., University of Pennsylvania, 1904.
C 64; 1929 Leavenworth.

PERCY LEIGH GAINEY,[4] A. M., M. S., Professor of Bacteriology (1914, 1922); 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.

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4. Absent on leave, February 1 to June 1, 1925.
5. Absent on leave, year 1924-'25.
6. Resigned.
7. In coöperation with the U. S. Department of Agriculture.

FORREST FAYE FRAZIER, C. E., Professor of Civil Engineering (1911, 1922).
C. E., Ohio State University, 1910. E 123; 1815 Leavenworth.

ROYCE GERALD KLOEFFLER, B. S., Professor of Electrical Engineering (1916, 1922).
B. S. in E. E., University of Michigan, 1913. E 120; 1218 Kearney.

CLINTON ELLIOTT PEARCE, S. B., Professor and Head of Department of Machine Design (1917, 1922.)
S. B., Massachusetts Institute of Technology, 1913. E 210; 615 N. Eleventh.

CHARLES HENRY SCHOLER, B. S., Professor and Head of Department of Applied Mechanics (1920, 1922); Engineer of Tests in the Roads Materials Laboratory (1920).
B. S., K. S. A. C., 1914. E 11; 806 Bluemont.

LOYAL FREDERICK PAYNE, B. S., Professor and Head of Department of Poultry Husbandry (1921, 1922); Poultry Husbandman, Agricultural Experiment Station (1921, 1922).
B. S., Oklahoma A. and M. College, 1912. Ag 245; 4 College Heights Road.

MARTHA S. PITTMAN, A. M., Professor of Food Economics and Nutrition (1919, 1922).
B. S., K. S. A. C., 1906; B. S., Columbia University, 1916; A. M., ibid., 1918.
L 43; 112 S. Twelfth.

GEORGE GEMMELL, M. S., Professor of Education, in Charge of Department of Home Study Service, Division of College Extension (1918, 1922).
B. S., Kansas State Teachers College, Pittsburg, 1917; B. S., K. S. A. C., 1920; M. S., ibid., 1922. A 5; 411 N. Sixteenth.

CHARLES WILLIAM BACHMAN, LL. B., Professor of Physical Education (1920, 1922); Head Coach of Athletics (1920).
LL. B., Notre Dame University, 1917. N 30; R. R. 1.

WILLIAM TIMOTHY STRATTON, A. M., Professor of Mathematics (1910, 1923).
A. B., Indiana University, 1906; A. M., ibid., 1913. E 223; R. F. D. 1.

ROY MONROE GREEN, M. S., Professor of Agricultural Economics (1920, 1923).
B. S. in Agr., University of Missouri, 1914; M. S., K. S. A. C., 1922.
Ag 345; 110 S. Seventeenth.

MARGARET M. JUSTIN, Ph. D., Dean of Division of Home Economics (1923).
B. S. in H. E., K. S. A. C., 1909; B. S. in Educ., Teachers' College, Columbia University, 1915; Ph. D., Yale University, 1923. L 29; 531 N. Manhattan Ave.

AMY JANE LEAZENBY ENGLUND, A. M., Professor and Head of Department of Household Economics (1920, 1923).
B. S., University of Missouri, 1917; A. M., University of Chicago, 1920.
L 42; 1605 Leavenworth.

AMY KELLY, B. S., State Home Demonstration Leader, Division of College Extension (1923).
B. S., South Dakota State College, 1908. A 36; 1649 Fairchild.

HEMAN LAURITZ IBSEN, Ph. D., Professor of Genetics (1919; July 1, 1924).
B. S., University of Wisconsin, 1912; M. S., ibid., 1913; Ph. D., ibid., 1916.
Ag 15A; 926 Vattier.

FRED WILLIAM BUGBEE, Lieut. Col. Inf., U. S. A., Professor and Head of Department of Military Science and Tactics (Aug. 13, 1924).
N 26; 204 S. Juliette.

ELDEN VALORIOUS JAMES, A. M., Professor of History and Civics (1912; Sept. 1, 1924).
A. B., Marietta College, 1901; A. B., University of Michigan, 1905; A. M., Marietta College, 1908. G 51A; 621 Humboldt.

PAUL WEIGEL, B. Arch., Professor and Head of Department of Architecture (1921; Sept. 1, 1924).

B. Arch., Cornell University, 1912; Architect, University of State of New York, 1920; Graduate, Buffalo Normal School, 1921. E 302; 1204 Fremont.

LILIAN CLARA WILLIAMS BAKER,[2] A. M., Professor and Head of Department of Clothing and Textiles (Sept. 1, 1924).

B. S., K. S. A. C., 1914; A. M., University of Chicago, 1921. L 56; 1430 Poyntz.

RALPH W. MORRISH, B. S. A., Professor of Junior Extension, in Charge of Boys' and Girls' Club Work, Division of College Extension (1920; Jan. 1, 1925).

B. S. A., Purdue University, 1920. A 37; 1430 Humboldt.

WALTER GILLING WARD, B. S., Arch., Professor, in Charge of Rural Engineering, Division of College Extension (1920; Jan. 20, 1925).

B. S. in Arch., K. S. A. C., 1912; Architect, ibid., 1922. E 130; 519 N. Manhattan.

CHARLES ELKINS ROGERS, A. B., Professor and Acting Head of Department of Industrial Journalism (1919; May 1, 1925).

A. B., University of Oklahoma, 1914. K 30; 532 N. Fourteenth.

HAROLD PARKER WHEELER, Professor and Head of Department of Music (1919; July 1, 1925).

M 30; 327 N. Fifteenth.

## ASSOCIATE PROFESSORS

GRACE EMILY DERBY, A. B., Associate Librarian (1911, 1918).

A. B., Western College for Women, 1905. F 32; 1825 Leavenworth.

JAMES WALKER MCCOLLOCH, M. S., Associate Professor of Entomology (1910, 1921); Associate Entomologist, Agricultural Experiment Station (1910, 1918).

B. S., K. S. A. C., 1912; M. S., K. S. A. C., 1923. F 52; 1626 Leavenworth.

INA FOOTE COWLES, B. S., Associate Professor of Clothing and Textiles (1902, 1918).

B. S., K. S. A. C., 1901. L 55; 1520 Leavenworth.

WILMER ESLA DAVIS,[12] 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., K. S. A. C., 1895; M. S., ibid., 1912. A 61; 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.

MALCOLM CAMERON SEWELL, Ph. D., Associate Professor of Soils (1914, 1920).

B. S., K. S. A. C., 1912; M. S., Ohio State University, 1914; Ph. D., University of Chicago, 1922. Ag 56; 315 N. Fifteenth.

WILLIAM HENRY SANDERS, M. E., Associate Professor of Agricultural Engineering (1914, 1920).

B. S., K. S. A. C., 1890; M. S., ibid., 1916. R 28; 1208 Kearney.

HARRY WINFIELD CAVE, M. S., Associate Professor of Dairy Husbandry (1918, 1920).

B. S. A., Iowa State College, 1914; M. S., K. S. A. C., 1916. Ag 151; 1638 Osage.

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2. Appointed for the year 1924-'25.

12. Absent on leave, Sept. 1, 1924, to Sept. 1, 1925.

EDGAR TALBERT KEITH, B.S., Associate Professor of Printing (1912, 1920).
B. S., K. S. A. C., 1912. K 30; 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.

CARL G. ELLING,[7] B.S., Associate Professor of Animal Husbandry, Division of College Extension (1918, 1921).
B. S., K. S. A. C., 1904. A 33; R. F. D. 1.

ALONZO FRANKLIN TURNER,[7] B.S., Associate Professor, Field Agent, Division of College Extension (1917, 1920).
B. S., K. S. A. C., 1905. A 2; 810 Moro.

JAMES WALTER ZAHNLEY, B.S., Associate Professor of Farm Crops (1915, 1921).
B. S., K. S. A. C., 1909; B. S. in Agr., ibid., 1918. Ag 314; 1131 Laramie.

LOUIS HENRY LIMPER, A.M., Associate Professor of Modern Languages (1914, 1921).
A. B., Baldwin Wallace College, 1907; A. M., University of Wisconsin, 1914. A 70; 1324 Laramie.

LOUIS COLEMAN WILLIAMS, B.S., Associate Professor of Horticulture, Division of College Extension (1915, 1921).
B. S., K. S. A. C., 1912; B. S., ibid., 1922. A 34; 1109 Kearney.

ROGER CLETUS SMITH, Ph.D., Associate Professor of Entomology (1920).
A. B., Miami University, 1911; A. M., Ohio State University, 1915; Ph. D., Cornell University, 1917. F 64; 1605 Leavenworth.

HILMER HENRY LAUDE, M.S., Associate Professor of Agronomy (1920, 1921).
B. S., K. S. A. C., 1911; M. S., Texas A. and M. College, 1918. Ag 202; 326 N. Sixteenth.

JOSEPH PRESTWICH SCOTT, D.V.M., Associate Professor of Pathology (1916, 1921).
B. S., Scientific Gymnasium, Lausanne, Switzerland, 1910; D. V. M., Ohio State University, 1914; M. S., K. S. A. C., 1924. V 2; 1626 Laramie.

WILLIAM MAX MCLEOD, D.V.M., Associate Professor of Anatomy (1919, 1921).
D. V. M., Iowa State College, 1917. V 32; 413 Houston.

EDWIN JACOB FRICK, D.V.M., Associate Professor of Medicine (1919, 1921).
D. V. M., Cornell University, 1917. B 32; 319 N. Sixteenth.

CHARLES WALTON MATTHEWS, A.M., Associate Professor of English (1920, 1921).
B. S., Kansas State Teachers College of Pittsburg, 1918; A. M., University of Chicago, 1923. K 51B; 1409 Anderson.

NORMAN EVERETT OLSON, B.S., Associate Professor of Dairy Husbandry (1921).
B. S., Iowa State College, 1915. Ag 151; 1601 Leavenworth.

FRANK CALEB GATES, Ph.D., Associate Professor of Botany (1919, 1922).
A. B., University of Illinois, 1910; Ph. D., University of Michigan, 1912. H 57; 1515 Humboldt.

FLOYD PATTISON, B.S., Associate Professor of Steam and Gas Engineering, Home Study Service, Division of College Extension (1919, 1922).
B. S., K. S. A. C., 1912. A 5; 805 Kearney.

MANFORD W. FURR, B.S., Associate Professor of Civil Engineering (1917, 1922).
B. S. in C. E., Purdue University, 1913. E 122; 1426 Humboldt.

7. In coöperation with the U. S. Department of Agriculture.

ELSIE HARRIET SMITH, Associate Professor of Music (1917, 1922).
Graduate, Certificate Course, Chicago Musical College, 1909; Postgraduate Diploma, Institute of Musical Art, New York City, 1914. M 58; 535 N. Manhattan.

ALBERT JOHN MACK, M.E., Associate Professor of Mechanical Engineering (1917, 1922).
B. S., K. S. A. C., 1912; M. E., ibid., 1921. E 109; 1512 Poyntz.

JULES HENRY ROBERT, B.S., Associate Professor of Applied Mechanics (1916, 1922).
B. S., University of Illinois, 1914. E 112; 1409 Anderson.

ELLIS ADOLPH STOKDYK, B.S., Associate Professor of Agricultural Economics, Division of College Extension (1921; Oct. 1, 1924).
B. S., University of Wisconsin, 1920; M. S., K. S. A. C., 1924. H 56; 1715 Anderson.

JACOB OLIN FAULKNER, A.M., Associate Professor of English (1922).
A. B., Washington and Lee University, 1907; A. M., Pennsylvania State College, 1920. K 52; 426 N. Seventeenth.

MARTHA MORRISON KRAMER, Ph.D., Associate Professor of Food Economics and Nutrition (1922).
B. S., University of Chicago, 1916; A. M., Columbia University, 1920; Ph. D., ibid., 1922. L 43; 426 N. Seventeenth.

EDGAR LEMUEL TAGUE, A.M., Ph.D., Associate Professor of Chemistry (1914, 1923); Assistant in Protein Chemistry, Agricultural Experiment Station (1914).
A. B., University of Kansas, 1908; A. M., ibid., 1909; Ph. D., ibid., 1924. C 3; 321 N. Delaware.

ROY WILLIAM KISER,[7] Associate Professor of Animal Husbandry, Division of College Extension (1918, 1923).
B. S., K. S. A. C., 1914. A 34; 1715 Laramie.

BERNARD MARTIN ANDERSON, B.S. in Ag., Associate Professor of Animal Husbandry (1920, 1923).
B. S. in Ag., K. S. A. C., 1916, 1923. Ag. 24; 323 Yuma.

HARRY ERNEST REED, B.S. Agr., Associate Professor of Animal Husbandry (1923).
B. S. in Ag., University of Missouri, 1914. Ag 27; 1119 Laramie.

ARTHUR FREDERICK PEINE, A.M., Associate Professor of History and Civics (1916, 1923).
A. B., Illinois Wesleyan University, 1911; A. M., University of Illinois, 1913. F 4; 319 N. Fifteenth.

WILLIAM RAYMOND BRACKETT, A.B., Associate Professor of Physics (1919, 1923).
A. B., University of Colorado, 1905. C 38; 1824 Humboldt.

EDWARD CHAPMAN CONVERSE, A.M., Associate Professor of Physics (1919, 1923).
A. B., University of Illinois, 1904; A. M., ibid., 1909. C 57; College Hill.

MARGARET RUSSEL, Ph.D., Associate Professor of English (1917, 1923).
A. B., Washburn College, 1913; A. M., Columbia University, 1915; Ph. D., Yale University, 1923. K 52; 917 Osage.

HERBERT HENLEY HAYMAKER, M.S., Associate Professor of Botany (1917, 1923).
B. S., K. S. A. C., 1915; M. S., University of Wisconsin, 1916. H 54; 315 N. Sixteenth.

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7. In coöperation with the U. S. Department of Agriculture.

GABE ALFRED SELLERS, B.S., Associate Professor of Shop Practice (1919; 1923).
B. S., K. S. A. C., 1917. S 62; 1001 Kearney.

PEARLE ETHEL RUBY, M.S., Associate Professor of Food Economics and Nutrition (1921; 1923).
A. B., Drake University, 1915; M. S., University of Chicago, 1920.
L 35; 426 N. Seventeenth.

HENRY ARTHUR SHINN, A.B., Associate Professor of Public Speaking (1923).
A. B., University of Kansas, 1916. G 55; Paddleford Apts. 5.

RICHARD CARLTON STICKNEY, Capt. Inf., U. S. A., Associate Professor of Military Science and Tactics (1923).
Graduate, U. S. Military Academy, 1915; Graduate, U. S. Infantry School, 1921.
N 26; 113 S. Eighth.

HARRISION BOYD SUMMERS, A.M., Associate Professor of Public Speaking (1923).
A. B., Fairmont College, 1917; A. M., University of Oklahoma, 1921.
G 55; 1011 Kearney.

DON CAMERON WARREN, Ph.D., Associate Professor of Poultry Husbandry (1923).
A. B., Indiana University, 1914; A. M., ibid., 1917; Ph. D., Columbia University, 1923.
Ag 249; 1208 Bluemont.

MAUDE WILLIAMSON, A.M., Associate Professor of Education (1923).
A. B., University of Illinois, 1909; A. M., Columbia University, 1920.
G 29; 514 N. Seventeenth.

EARL BOOTH WORKING, Ph.D., Associate Professor of Milling Industry (1923).
A. B., University of Denver, 1917; A. M., ibid., 1919; Ph. D., University of Arizona, 1922.
Ag 38A; 1819 Leavenworth.

ERNEST BLAINE WELLS, M.S., Associate Professor of Soils, Division of College Extension (1920; 1924).
B. S. A., West Virginia University, 1917; M. S., K. S. A. C., 1922.
Ag 59; 1615 Leavenworth.

EMERSON CALVIN LEWELLEN,[6] State Dairy Commissioner (April 1, 1924-April 15, 1925).
X; 806 Osage.

ALFRED LESTER CLAPP, B.S., Associate Professor of Agricultural Extension (1920; July 1, 1924); District Agent, Division of College Extension (1920; July 1, 1924).
B. S., K. S. A. C., 1914. A 2; 930 Kearney.

GEORGE EDWIN JOHNSON, Ph.D., Associate Professor of Zoölogy (July 1, 1924); Mammalogist, Agricultural Experiment Station (July 1, 1924).
B. S., Dakota Wesleyan University, 1913; M. S., University of Chicago, 1916; Ph. D., Harvard University, 1923. F 54A; 1506 Poyntz.

PAUL PORTER BRAINARD, A.M., Associate Professor of Psychology (1919; Sept. 1, 1924).
B. L., Whitman College, 1909; A. M., Columbia University, 1913.
G 33A; 1224 Thurston.

ALLAN PARK DAVIDSON, B.S., Associate Professor of Vocational Education (1919; Sept. 1, 1924).
B. S., K. S. A. C., 1914. G 29; 1221 Laramie.

FLORIAN ARTHUR KLEINSCHMIDT, M.Arch., Associate Professor of Architecture (1923; Sept. 1, 1924).
B. S., in Arch., University of Minnesota, 1920; M. Arch., Harvard University, 1922.
E 304; 414 Pierre.

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6. Resigned.

CHRISTOPHER DUDLEY PEIRCE, Major C. A. C., U. S. A., Associate Professor of Military Science and Tactics (Sept. 1, 1924).
N 26; 1715 Poyntz.

BEATTY HOPE FLEENOR, M.S., Associate Professor of Education, Home Study Service, Division of College Extension (1923; Dec. 1, 1924).
B. S., K. S. A. C., 1919; M. S., ibid., 1923. A 5; 1612 Osage.

OTIS JAY GOULD, Sr., State Dairy Commissioner (Apr. 15, 1925).
X 26; 909 Bluemont.

## ASSISTANT PROFESSORS

WALTER LEROY LATSHAW, M.S., Assistant Professor of Chemistry (1914, 1918).
B. S., Pennsylvania State College, 1912; M. S., K. S. A. C., 1922. C 3; 927 Fremont.

DANIEL EMMETT LYNCH, Assistant Professor of Forging (1914, 1920); Foreman of Blacksmith Shop (1914).
S 38; R. R. 1.

EDWARD C. JONES, M.E., Assistant Professor of Shop Practice (1916, 1920).
B. M. E., Iowa State College, 1905; M. E., ibid., 1922. S 32; 1031 Kearney.

LEON VINCENT WHITE, C.E., Assistant Professor of Civil Engineering (1918, 1920).
B. S., K. S. A. C., 1903; C. E., ibid., 1918. E 122; R. R. 1.

CLIFF ERRETT AUBEL, M.S., Assistant Professor of Animal Husbandry (1919, 1920).
B. S., Pennsylvania State College, 1915; M. S., K. S. A. C., 1917.
Ag 13; 530 N. Fourteenth.

ELIZABETH HAMILTON DAVIS, A.B., B.L.S., Reference Librarian (1920).
A. B., Illinois Women's College, 1909; B. L. S., University of Illinois, 1914.
F 35; 525 N. Manhattan.

LAWRENCE WILLIAM HARTEL, M.S., Assistant Professor of Physics (1920).
A. B., Central Wesleyan College, 1911; B. S., ibid., 1912; B. S. in Ed., University of Missouri, 1915; M. S., K. S. A. C., 1924. C 34; 1026 Vattier.

ERVIN ARTHUR KNOTH, G.G., Assistant Professor of Physical Education (1920).
Graduate Gymnast, Normal College of America Gymnastic Union, 1917.
N 36; 814 Osage.

IGNATIUS ALBERT WOJTASZAK, B.S., Assistant Professor of Applied Mechanics (1920).
B. S., University of Michigan, 1920. E 113; 1115 Bluemont.

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; R. R. 8.

EARLE REED DAWLEY, B.S., Assistant Professor of Applied Mechanics, and Assistant Engineer of Tests (1920).
B. S., University of Illinois, 1919. E. 16; 1200 Kearney.

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.

GEORGE W. SALISBURY, B.S., Assistant Professor of Agricultural Extension 1919, 1921); District Agent, Division of College Extension (1919, July 1, 1924).
B. S., University of Illinois, 1915. A 2; 312 N. Sixteenth.

WILLIAM FRANCIS PICKETT, M.S., Assistant Professor of Horticulture (1917, 1921).
B. S., K. S. A. C., 1917; M. S., ibid., 1923. H 30; 923 Laramie.

FLOYD ALONZO SMUTZ, B.S., Assistant Professor of Machine Design (1918, 1921).
B. S. in Arch., K. S. A. C., 1914. S 51; 1530 Pierre.

MERRILL AUGUSTUS DURLAND, M.S., M.E., Assistant Professor of Mechanical Drawing (1919, 1921).
B. S., K. S. A. C., 1918; M. E., ibid., 1922; M. S., ibid, 1923. E 209; 1715 Houston.

CHARLES HOWARD KITSELMAN, V.M.D., Assistant Professor of Pathology (1919, 1921).
V. M. D., University of Pennsylvania, 1918. V 28; 1108 Laramie.

RUDOLPH H. DRIFTMIER, B.S., Assistant Professor of Agricultural Engineering (1920, 1921).
B. S. in A. E., Iowa State College, 1920. E 216; 611 Kearney.

HELEN ELIZABETH ELCOCK, A.M., Assistant Professor of English (1920, 1921).
A. B., College of Emporia, 1907; A. M., University of Chicago, 1921.
A 55; 1641 Fairchild.

EMMA HYDE, A.M., Assistant Professor of Mathematics (1920, 1921).
A. B., University of Kansas, 1912; A. M., University of Chicago, 1916.
A 62A; 320 N. Fifteenth.

CLARENCE FLAVIUS LEWIS, A.B., Assistant Professor of Mathematics (1920, 1921).
A. B., University of Denver, 1913. E 223; 808 N. Juliette.

ANNA MARIE STURMER, A.M., Assistant Professor of English (1920, 1921).
A. B., University of Nebraska, 1917; A. M., ibid., 1920. A 53; 1725 Poyntz.

ROBERT GORDON, Assistant Professor of Music (1921).
Diploma in Theory and Band Instruments, School of Music, University of Michigan, 1920.
MA 5; 227 Houston.

NATHAN DANIEL HARWOOD, D.V.M., Assistant Professor, Department of Vaccine Laboratories (1918, 1921).
D. V. M., K. S. A. C., 1918. V 32; 328 Fremont.

CHARLES DEFOREST DAVIS, B.S., Assistant Professor of Farm Crops (1921).
B. S., K. S. A. C., 1921. Ag 79; 609 N. Ninth.

EUGENE SIDNEY LYONS, B.S., Assistant Professor of Soils (1920, 1922).
B. S., K. S. A. C., 1921. Ag 216; 354 N. Sixteenth.

DAVID LESLIE MACKINTOSH, B.S., Assistant Professor of Animal Husbandry (1921, 1922).
B S., University of Minnesota, 1920. Ag 13; 1016 Osage.

LUTHER EARL WILLOUGHBY, B.S., Assistant Professor of Farm Crops, Division of College Extension (1917, 1922).
B. S., K. S. A. C., 1912; B. S. in Agr., ibid., 1916. Ag 59; 918 Thurston.

EDNA M. ELLIS,[6] Assistant Professor of Voice (1921, 1922-May 31, 1925).
Certificate, Public-school Music Methods, DePauw University, 1919.

RAY FLAGG, Assistant Professor of Shop Practice (1921, 1922).
B. S. in E. E., Purdue University, 1905. S 62; 1019 Moro.

JAMES VERNE COLE, Second Lieut. Inf., U. S. A., Assistant Professor of Military Science and Tactics (1921, 1922).
N 27; 829 Fremont.

6. Resigned.

HELEN ADELIA BISHOP,[5] A. M., Assistant Professor of Household Economics (1922).
B. S., James Millikin University, 1909; A. M., Columbia University, 1922.
T 202; 1641 Laramie.

CHARLES MECLAIN CORRELL, Ph. M., Assistant Professor of History and Civics (1922).
B. S., K. S. A. C., 1900; Ph. B., University of Chicago, 1907; Ph. M., ibid., 1908.
Ag 253; 1621 Fairchild.

BESSIE BELLE LITTLE, M. S., M. D., Assistant Physician, Department of Student Health (1922); Dean of Staff, Charlotte Swift Memorial Hospital.
B. S., K. S. A. C., 1891; M. S., ibid., 1905; M. D., Woman's Medical College of Pennsylvania, 1906. A 59; 318 N. Fifth.

JAMES HENDRIX MCADAMS, B. S., Assistant Professor of Poultry Husbandry, Division of College Extension (1922).
B. S., K. S. A. C., 1916. Ag 250; 1507 Leavenworth.

DELBERT JACOB TAYLOR, B. S., Assistant Professor of Poultry Husbandry, Division of College Extension (1922).
B. S. in Agri., Purdue University, 1914. Ag 38A; 600 N. Manhattan.

IRA NICHOLS CHAPMAN, B. S., Assistant Professor of Agricultural Economics, Division of College Extension (1922).
B. S., K. S. A. C., 1916. Ag 345; 1210 Thurston.

HARLAN RANDOLPH SUMNER, A. M., Assistant Professor of Crops, Division of College Extension (1923).
B. S., K. S. A. C., 1916; A. M., University of Missouri, 1917. Ag 59; Paddleford Apts.

IZIL ISABEL POLSON, Assistant Professor of Industrial Journalism (1918, 1923).
B. S., K. S. A. C., 1914; M. S., Medill School of Journalism, Northwestern University, 1924.
K 27; 830 Bertrand.

MORRIS EVANS, B. S., Assistant Professor of Agricultural Economics (1920, 1923).
B. S. in Agri., K. S. A. C., 1920. Ag 348; 1601 Poyntz.

CHAUNCEY ELIAS SAWYER, D. V. M., Assistant Professor of Pathology (1921, 1923).
D. V. M., K. S. A. C., 1921. V 55A; 628 Fremont.

ARTHUR CECIL FAY, M. S., Assistant Professor of Bacteriology (1921, 1923).
B. S., University of Missouri, 1920; M. S., University of Wisconsin, 1921.
V 28; 1621 Leavenworth.

WILLIAM ALEXANDER VAN WINKLE, Ph. D., Assistant Professor of Chemistry (1922, 1923).
B. S., University of Chicago, 1911; M. S., University of Illinois, 1917; Ph. D., ibid., 1920.
D 30; 812 Laramie.

LILLIAN MAUDE FINLEY, B. S., Assistant Professor of Clothing and Textiles, Division of College Extension (1921, 1923).
B. S., Kansas State Teachers College, Pittsburg, 1912; B. S., Columbia University, 1922.
A 36; 817 Poyntz.

JOSEPH LOWE HALL, Ph. D., Assistant Professor of Chemistry (1922, 1923).
B. S., University of Illinois, 1919; M. S., ibid., 1921; Ph. D., ibid., 1922.
C 10; 1409 Anderson.

NORA ELIZABETH DALBEY, A. M., Assistant Professor of Botany and Plant Pathology (1918, 1923).
A. B., University of Kansas, 1913; A. M., ibid., 1914. H 54; 1424 Fairchild.

GRACE ROBERTA HESSE, A. M., Assistant Professor of Modern Languages (1917, 1923).
A. B., University of Michigan, 1917; A. M., ibid., 1924. A 70; 830 Bertrand.

5. Absent on leave, year 1924-'25.

KATHERINE HUDSON, M. S., Assistant Professor of Food Economics and Nutrition (1920, 1923).
B. S., University of Wisconsin, 1918; M. S., Columbia University, 1923. L 47; 1119 Laramie.

THOMAS JOEL ANDERSON, JR., A. M., Assistant Professor of Economics (1922, 1923).
B. S., University of Missouri, 1922; A. M., ibid., 1923. A 74; 1420 Laramie.

GRACE LOUISE ELIZABETH BISCHOF, B. L. S., Head of Circulation Department, College Library (1923).
A. B., Colorado College, 1920; B. L. S., University of State of New York, 1922. F 27; 1739 Fairchild.

FRANK JACOBS CHEEK, JR., C. E., Assistant Professor of Architecture (1923).
A. B., Center College, 1914; C. E., Rensselaer Polytechnic Institute, 1919. E 304; 1209 Vattier.

CHARLES WILLIAM CORSAUT, Assistant Professor of Physical Education (1923).
Graduate, Y. M. C. A. College, 1917. N 36; 1601 Humboldt.

VERNE RUSSELL HILLMAN, B. S., A. E., Assistant Professor of Agricultural Engineering (1923).
B. S. A. E., Iowa State College, 1920. E 216; 918 N. Tenth.

IRA KAULL LANDON, B. S. in Agr., Assistant Professor of Agronomy (1923).
B. S. in Agr., K. S. A. C., 1921. Ag 201; 615 N. Ninth.

RUTH MORRIS, A. M., Assistant Professor of Physical Education for Women (1923).
A. B., University of Wisconsin, 1915; A. M., Columbia University, 1920. N 3; 514 N. Seventeenth.

LESLIE RAY PUTNAM, B. M., Assistant Professor of Voice (1923).
B. S., Cornell College, 1910; Mus. G., Northwestern University, 1914; B. M., Cornell College, 1922. MA 7; 826 Houston.

GEORGE HELMICK ROSS, M. D., Assistant Physician, Department of Student Health (1923).
M. D., Kansas City University Medical College, 1913. A 64; 624 Poyntz.

CHARLES WINSHIP JONES, Capt. Inf., U. S. A., Assistant Professor of Military Science and Tactics (1923).
B. S., Purdue University, 1915; Graduate, U. S. Infantry School, 1921. N 26; 617 Houston.

ARTHUR WILLIAM KNOTT, B. S. in Agr., Assistant Professor of Dairy Husbandry, Division of College Extension (1923).
B. S. in Agr., University of Wisconsin, 1918. Ag 147; 512 N. Eighteenth.

LESSLEY EUGENE SPENCER, Capt., C. A. C., U. S. A., Assistant Professor of Military Science and Tactics (1923).
Graduate, Coast Artillery School, 1922. N 26; 1505 Humboldt.

WELCOME PORTER WALTZ, Capt. Inf., U. S. A., Assistant Professor of Military Science and Tactics (1923).
Graduate, Infantry School, 1922. N 26; 621 N. Juliette.

FRANK OTTO BLECHA, B. S., Assistant Professor of Agricultural Extension; District Agricultural Agent, Division of College Extension (1919, 1923).
B. S., K. S. A. C., 1918. A 2; 1422 Poyntz.

CHARLES RANGER ENLOW, B. S. in Agr., Assistant Professor of Coöperative Experiments, Department of Agronomy (May 26, 1924).
B. S. in Agr., K. S. A. C., 1920. Ag 202; 613 N. Sixteenth.

RUTH HARTMAN, Assistant Professor of Music (June 1, 1924).
Graduate, Department of Public School Music, Iowa State Teachers 'College, 1912; Two-year Certificate, Northwestern University, 1923. M 53; 830 Bertrand.

WALTER BUSWELL BALCH, B. S., Assistant Professor of Horticulture (1921; July 1, 1924); Greenhouse Foreman (1921).
B. S., Cornell University, 1919. H 33; 532 N. Fourteenth.

HOWARD HAROLD STEUP, B. S., Assistant Professor of Poultry Husbandry (1922; July 1, 1924).
B. S., Purdue University, 1919. Ag 252; 1116 Bluemont.

RICHARD PEREGRINE WHITE, B. S., Assistant Professor of Botany and Plant Pathology (1921; July 1, 1924); Assistant Plant Pathologist, Agricultural Experiment Station, 1921).
B. S., Dartmouth College, 1918. H 56; 1819 Leavenworth.

ARTHUR HERSCHEL HELDER, M. L. A., Assistant Professor of Landscape Gardening (July 1, 1924).
B. S., K. S. A. C., 1904; M. S., ibid., 1908; M. L. A., Massachusetts Agricultural College, 1918; M. L. A., Harvard University, 1920. H 33; 901 Osage.

ERNEST BAKER KEITH, Ph. D., Assistant Professor of Chemistry (1918; Sept. 1, 1924).
B. S., K. S. A. C., 1913; Ph. D., University of Chicago, 1924. W 27; 1215 Vattier.

EDGAR MCCALL AMOS, B. S., Assistant Professor of Industrial Journalism and Printing (1920; Sept. 1, 1924).
B. S., K. S. A. C., 1902. K 31; 1015 Leavenworth.

OTIS IRVIN GRUBER,[8] Assistant Professor of Voice (1921; Sept. 1, 1924).
Graduate, Knox Conservatory of Music, 1918. MA 8; 1115 Bluemont.

ERIC ROSS LYON, M. S., Assistant Professor of Physics (1921; Sept. 1, 1924).
A. B., Phillips University, 1911; M. S., ibid., 1923. C 61; 823 Bluemont.

ARTHUR BRADLEY SPERRY,[5] Assistant Professor of Geology (1921; Sept. 1, 1924).
B. S., University of Chicago, 1919. F 62; 1115 Bluemont.

WILHELMINA BATES, A. M., Assistant Professor of Household Economics (1922; Sept. 1, 1924), in Charge of Cafeteria (1922; Sept. 1, 1924).
Ph. B., Stetson University, 1919; A. M., ibid., 1921. T 29; 426 N. Seventeenth.

EUGENE CLAYTON GRAHAM, B. S., Assistant Professor of Shop Practice (1922; Sept. 1, 1924).
B. S., Carleton College, 1898; B. S. in M. E., University of Minnesota, 1902.
E. 207; 1100 Moro.

MINNA ERNESTINE JEWELL, Ph. D., Assistant Professor of Zoölogy (1922; Sept. 1, 1924).
A. B., Colorado College, 1914; A. M., University of Illinois, 1915; Ph. D., ibid., 1918.
F 62; 830 Laramie.

GERALD WOODWARD FITZGERALD, D. V. M., Capt. V. C., U. S. A., Assistant Professor of Military Science and Tactics (Sept. 1, 1924).
D. V. M., K. S. A. C., 1916. V 27; 625 Houston.

ALENE THERESA HINN, A. M., Assistant Professor of Clothing and Textiles (Sept. 1, 1924).
B. S., University of Wisconsin, 1915; A. M., Columbia University, 1924.
L 64; 1649 Fairchild.

NELSON OTIS KENNEDY, Mus. B., Assistant Professor of Piano (Sept. 1, 1924).
Mus. B., Knox Conservatory of Music, 1923. MA; 1212 Fremont.

WALDO HIRAM LYONS, A. M., Assistant Professor of Music (Sept. 1, 1924).
A. B., University of Denver, 1912; A. M., ibid., 1916. E 223; 358 N. Fifteenth.

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5. Absent on leave, year 1924-'25.
8. Absent on leave, Nov. 1, 1924, to Jan. 31, 1925.

CLARICE MARIE PAINTER, Assistant Professor of Piano (Sept. 1, 1924).
Diploma in Piano, Hardin College, 1919; Diploma, New England Conservatory of Music, 1922. M 51; 1725 Fairchild.

FRANK PLETCHER ROOT, M.S., Assistant Professor of Physical Education and Athletics (Sept. 1, 1924).
B. S., K. S. A. C., 1914; M. S., ibid., 1924. N 35; 910 Bluemont.

THOMAS BOWERMAN WILLIAMS,[2] Ph. D., Assistant Professor of Geology (Sept. 1, 1924).
B. S., Queens University, 1909; M. S., ibid., 1913; Ph. D., University of Wisconsin, 1924. F 61; 1212 Fremont.

RILEY EDWARD MCGARRAUGH, B.S., First Lieut. C. A. C., U. S. A., Assistant Professor of Military Science and Tactics (Sept. 18, 1924).
B. S., K. S. A. C., 1917. N 26; 530 Bertrand.

WILLIAM WARREN WERTZ, A.B., Capt. C. A. C., U. S. A., Assistant Professor of Military Science and Tactics (Nov. 2, 1924).
A. B., Doane College, 1916. N 26; 1605 Pierre.

CLAUDE KEDZIE SHEDD, B.S. in A.E., Assistant Professor of Rural Engineering, Division of College Extension (Jan. 20, 1925).
B. S., in Agr., University of Nebraska, 1909; B. S. in Ag. Engrg., Iowa State College, 1914. E 131; 1331 Poyntz.

ALFRED THOMAS PERKINS, Ph. D., Assistant Professor of Chemistry (Jan. 22; 1925).
B. S., Pennsylvania State College, 1920; M. S., Rutgers College, 1922; Ph. D., ibid., 1923. C 3; 1116 Bluemont.

DONALD R. PORTER, B.S., Assistant Professor of Plant Pathology, Division of College Extension (Feb. 15, 1925).
B. S., Iowa State College, 1923. H 53; 1725 Anderson.

## ASSOCIATES

HOWARD ROBERT DEROSE, Associate in Food Analysis (1919).
W 26; 1409 Anderson.

ROLLA WILLIAMS TITUS, A.M., Associate in Feed-stuffs Analysis (1923).
A. B., Washburn College, 1909; A. M., University of Kansas, 1914. C 3; 1230 Pierre.

ARTHUR MAXWELL BRUNSON,[7] Associate in Plant Breeding, Agricultural Experiment Station (1923).
B. S., University of Illinois, 1913; M. S., ibid., 1919; Ph. D., Cornell University, 1923. Ag 313; 1725 Leavenworth.

## INSTRUCTORS

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., K. S. A. C., 1897; B. S., Kansas State Teachers College, Emporia, 1916. A 62A; 1001 Moro.

EMMA FLORA FECHT, Instructor in Clothing and Textiles (1913, 1914).
Graduate, Bradley Polytechnic Institute, 1912. L 55; 315 N. Sixteenth.

STELLA MAUDE HARRISS, M.S., Instructor in Chemistry (1917, 1918).
B. S., K. S. A. C., 1917; Graduate, (Peru) Nebraska State Normal School, 1908; M. S., K. S. A. C., 1919. W 26; 1637 Osage.

2. Appointed for the year 1924-'25.
7. In coöperation with the U. S. Department of Agriculture.

KATHERINE MAXWELL BOWER, B. S., Instructor in English (1918, 1919).
B. S., K. S. A. C., 1915; A. M., University of Kansas, 1924. A 54; 817 Poyntz.

W. PEARL MARTIN, R. N., Instructor in Home Health and Sanitation, Division of College Extension (1919).
Graduate, Christ's Hospital, Topeka. A 36; 930 Osage.

HARRY WORKMAN AIMAN, A. B., Instructor in Woodwork (1918, 1919); Foreman of Wood Shops (1918, 1919).
A. B., Oskaloosa College, 1921. S 29B; 1218 Bertrand.

S. FRED PRINCE, Biological Artist (1918, 1919).
F 55; 925 Thurston.

MARY FIDELIA TAYLOR,[5] B. S., Instructor in Physics (1919).
B. S., K. S. A. C., 1919. C 36; 350 N. Sixteenth.

STANLEY PAUL HUNT, B. S., Instructor in Machine Design (1920).
B. S., K. S. A. C., 1919. E 209; 522 Vattier.

LOUISE HELEN EVERHARDY, Instructor in Applied Art (1919, 1920).
Graduate, New York School of Fine and Applied Art, 1923. A 67B; 1109 Kearney.

ANNABEL ALEXANDER GARVEY, A. M., Instructor in English (1920).
A. B., Wellesley College, 1912; A. M., University of Kansas, 1914.
A 54; 343 N. Fourteenth.

HELEN DOROTHY RUSHFELDT, A. M., Instructor in English (1920).
A. B., University of Minnesota, 1915; A. M., Columbia University, 1920.
A 61; 513 N. Sixteenth.

MARION COFFEE, First Sergt., U. S. A., Instructor in Military Training (1920).
N 26; R. R. 8.

HAROLD REED GUILBERT, B. S., Instructor in Agriculture (1920).
B. S., K. S. A. C., 1920. G 29; 412 Fremont.

ESTHER BRUNER, M. S., Instructor in Chemistry (1920).
B. S., K. S. A. C., 1920; M. S., ibid., 1921. W 26; 311 Denison.

HARRIET WRIGHT ALLARD, B. S., Instructor in Household Economics, Division of College Extension (1917, 1921).
B. S., K. S. A. C., 1923. A 36; 1005 Vattier.

EDWARD GRANELL,[5] Instructor in Shop Practice (1919, 1921).

DOROTHY JOSEPHINE CASHEN, M. S., Instructor in Botany (1919, 1921).
B. S., Carthage College, 1917; M. S., K. S. A. C., 1920. H 57; 1605 Leavenworth.

HENRY WHITE MARSTON, M. S., Instructor in Animal Husbandry (1919, 1921).
B. S. A., Delaware State College, 1919; M. S., K. S. A. C., 1921.
Ag 18; 1638 Laramie.

ALBERT JOSEPH SCHOTH, B. S., Instructor in Garden and Farm Crops, Division of College Extension (1921).
B. S., Oregon Agricultural College, 1918. Ag 215; 1115 Bluemont.

NELLIE ABERLE, M. S., Instructor in English (1921).
B. S., K. S. A. C., 1912; M. S., ibid., 1914. A 56; 1442 Fairchild.

HAROLD ALLEN, B. S., Instructor in Applied Mechanics (1921); Assistant Engineer of Tests (Sept. 1, 1924).
B. S. in C. E., University of Colorado, 1920. E 113; 112 S. Eleventh.

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5. Absent on leave, year 1924-'25.

ADA GRACE BILLINGS, B. S., Instructor in History and Civics, Home-study Service, Division of College Extension (1921).
B. S., K. S. A. C., 1916. A 5; 714 Moro.

CLARA BOGUE, A. M., Instructor in English (1921).
B. S. in Ed., Kansas State Normal School, 1919; A. M., University of Chicago, 1921. A 56; 830 Leavenworth.

CECIL AGUILA GUNNS, Instructor in Zoölogy (1921).
F 76A; 926 Vattier.

CHARLES NITCHER, B. S., Instructor in Animal Husbandry, Home-study Service, Division of College Extension (1921).
B. S., K. S. A. C., 1921. A 5; 415 N. Sixteenth.

JESSE EARL SELLERS, B. S. in Ch. E., Instructor in Chemistry (1921).
B. S. in Ch. E., University of Colorado, 1921. W 30; 1116 Bluemont.

ELLEN MARGARET BATCHELOR, B. S., Assistant State Home Demonstration Leader, Division of College Extension (1917, 1921).
B. S., K. S. A. C., 1911. A 36; 1649 Fairchild.

MAYNARD HENRY COE, B. S., Instructor in Animal Husbandry, Division of College Extension (1922).
B. S., University of Minnesota, 1917. Ag 19; 336 N. Sixteenth.

COMMODORE FOOTE COOL, A. B., Instructor in Carpentry (1922).
A. B., Kansas State Teachers College, Emporia, 1897; B. O., ibid., 1897. S 29; 1006 Bluemont.

LUELLA PEARL SHERMAN,[6] B. S., Instructor in Foods and Nutrition, Division of College Extension (1923-Nov. 15, 1924).
B. S., K. S. A. C., 1922.

MARY ELIZABETH POLSON, A. M., Instructor in Clothing and Textiles (1920, 1922).
B. S., K. S. A. C., 1916; A. M., University of Chicago, 1924. L 65; 830 Bertrand.

MATTHEW JOSEPH CONNOLLY, Sergt. Inf., U. S. A., Instructor in Military Science and Tactics (1921, 1922).
N 26; 714 Humboldt.

WILLIAM ILLINGWORTH, Master Sergt., C. A. C., U. S. A., Band Leader (1921, 1922).
N 54; 510 Kearney.

ROY DE WITT PAQUETTE,[6] Sergt., C. A. C., U. S. A., Instructor in Military Science and Tactics (1922-Jan. 11, 1925).

MARCIA HALL, A. B., Instructor in English, Home-study Service, Division of College Extension (1923).
A. B., University of Wisconsin, 1914. A 5; 1423 Fairchild.

HOWARD PINKERTON, Instructor in Shop Practice (1922).
1319 Anderson.

FLORENCE ROBERTA CLARKE, A. B., Instructor in Clothing and Textiles (1922).
A. B., University of Washington, 1916. L 64; 1412 Leavenworth.

WILLIAM CHARLES JANES, A. M., Instructor in Mathematics (1922).
B. S., Northwestern University, 1919; A. M., University of Nebraska, 1922. S 55; 1222 Bluemont.

RUSSELL MARION KERCHNER, B. S., Instructor in Electrical Engineering (1922).
B. S., University of Illinois, 1922. E 24; 351 N. Fifteenth.

6. Resigned.

HARRY KING LAMONT, Instructor in Violin (1922).
M 52; 624 Houston.

MENDEL ELMER LASH, M.S., Instructor in General Chemistry (1922).
A. B., Ohio State University, 1920; M. S., ibid., 1922. C 10; 1116 Bluemont.

THIRZA ADALINE MOSSMAN, A. M., Instructor in Mathematics (1922).
A. B., University of Nebraska, 1916; A. M., University of Chicago, 1922.
A 62A; 1739 Fairchild.

WILLIAM HOBSON ROWE, A.B., Instructor in Mathematics (1922).
A. B., University of Michigan, 1922. S 56; 1809 Leavenworth.

NAOMI BERTHA ZIMMERMAN, M.S., Instructor in Zoölogy (1922).
B. S., University of Nebraska, 1919; M. S., ibid., 1922. F 62; 1433 Anderson.

ROY WILSON WAMPLER, M.S., Instructor in Chemistry (1921, 1922).
A. B., McPherson College, 1920; M. S., K. S. A. C., 1921. C 10; 819 Kearney.

WILLIAM RUSSELL HINSHAW, D. V. M., Instructor in Bacteriology (1923).
D. V. M., Michigan Agricultural College, 1923. V 53; 1416 Humboldt.

ELIZABETH AUSTIN, B.S., Assistant Reference Librarian (1923).
B. S., Simmons College, 1923. F 27; 1739 Fairchild.

JOHN FLOWER BULLARD, D.V.M., Instructor in Surgery and Medicine (1923).
D. V. M., Cornell University, 1922. Vet. Hospital.

JULIAN ADAIR HODGES, M.S., Instructor in Agricultural Economics (1923).
B. S. Agr., University of Kentucky, 1917; M. S. in Agr. Ec., ibid., 1923.
Ag 348; 418 N. Fifth.

JESSIE GULICK, Acting Head Cataloguer in Library (1907, 1923).
F 27; 421 N. Sixteenth.

ETHEL MAY ARNOLD,[4] B.S., Instructor in Applied Art (1922, 1923).
B. S., K. S. A. C., 1918; Graduate, French-American School of Costume Designing, Los Angeles, 1921. A 68; College Hill.

INEZ GERTRUDE ALSOP, M.S., Instructor in History and Civics (1923).
B. S., Kansas State Teachers College, Emporia, 1916; M. S., University of Kansas, 1920.
F 1; 1423 Fairchild.

BOYD BERTRAND BRAINARD, B.S., Instructor in Mechanical Engineering (1923).
B. S. in M. E., University of Colorado, 1922. E 109; 901 Bluemont.

DOROTHY CREGIER BROWN, Instructor in Piano (1923).
Teacher's Certificate, Caruther's School of Piano, 1921. M 55; 1605 Leavenworth.

ERNEST KNIGHT CHAPIN, M.S., Instructor in Physics (1923).
A. B., University of Michigan, 1918; M. S., ibid., 1923. C 57; 819 Bluemont.

LUELLA CORY,[9] B.L.S., Loan Assistant in Library (1923).
A. B., University of Kansas, 1916; B. L. S., University of Illinois, 1923.
F 32; 1517 Leavenworth.

WILLIAM WESLEY CRAWFORD, M.Di., Instructor in Civil Engineering (1923).
A. B., State University of Iowa, 1912; B. S. in C. E., Iowa State College, 1917; M. Di., Iowa State Teachers College, 1905. E 220; 715 Poyntz.

JEAN SWIFT DOBBS, B.S., Instructor in Household Economics (1923).
B. S., Northwestern University, 1923; R. N., Evanston Hospital, 1922.
L 40; 318 N. Fifth.

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4. Absent on leave, Feb. 1 to June 1, 1925.
9. Absent on leave, Nov. 1, 1924, to June 30, 1925.

RANDOLPH FORNEY GINGRICH, B.S.C.E., Instructor in Machine Design (1923).
B. S. C. E., University of Nebraska, 1923. S 51; 923 Osage.

ORVILLE DON HUNT, B.S. in E.E., Instructor in Electrical Engineering (1923).
B. S. in E. E., Washington State College, 1923. E 24; 919 Humboldt.

GLENN HOWE JOSEPH, M.S., Instructor in Chemistry (1923).
B. S., University of Illinois, 1922; M. S., ibid., 1923. D 30; 901 Laramie.

CARL HERMAN KNEPPER, B.S., Instructor in Mathematics (1923).
B. S. in Commerce, University of Iowa, 1922. S 55; 615 Humboldt.

GEORGE WILLIAM KUERNER, M.S., Instructor in General Chemistry and Qualitative Analyses (1923).
B. S., Pennsylvania State College, 1922; M. S., University of Utah, 1923.
D 30; 1115 Bluemont.

ROBERT HENRY LUSH, M.S., Instructor in Dairy Husbandry (1923).
B. S., K. S. A. C., 1921; M. S., University of Minnesota, 1923.
Ag 165; 1326 Fremont.

REED FRANKLIN MORSE, B.S., Instructor in Civil Engineering (1923).
A. B., Cornell College, 1921; B. S., Iowa State College, 1923. E 220; 1116 Bluemont.

EDNA MARIE WILLMANN, A.B., Instructor in Modern Languages (1923).
A. B., University of Kansas, 1917. A 70; 900 Leavenworth.

PHILIP ANTON WILLIS, B.S., Instructor in Mechanical Engineering (1923).
B. S. in M. E., Montana State College, 1922. E 109; 1116 Bluemont.

ARTHUR WEBER, B.S., Instructor in Animal Husbandry (1923).
B. S., K. S. A. C., 1922. Ag 13; 359 N. Fifteenth.

WALTER BACKUS WILSON, Instructor in Electrical Engineering (1923).
Graduate, Lowell Institute, Massachusetts Institute of Technology, 1921; Graduate, General Electric Engineering School, 1922. E 19; 1204 Fremont.

WILLIAM REDMOND MARTIN, JR., B.S., Instructor in Horticulture, Division of College Extension (1924).
B. S., K. S. A. C., 1917. H; 1116 Bluemont.

LEONARD HUGHES CHURCH, B.S. in E.E., Instructor in Electrical Engineering (Jan. 1, 1924).
B. S. in E. E., Purdue University, 1923. E 24; 1116 Bluemont.

MABEL ARDIS MURPHY, B.M., Instructor in Music (Feb. 1, 1924).
B. M., K. S. A. C., 1923. M 54; 1414 Humboldt.

LORETTA MCELMURRY, B.S., Instructor in Clothing and Textiles, Division of College Extension (March 1, 1924).
B. S., South Dakota State College, 1901. A 26; 406 Leavenworth.

CHARLOTTE ELIZABETH BIESTER, B.S., Assistant State Club Leader, Division of College Extension (April 1, 1924).
B. S., University of Illinois, 1921. A 35; 1212 Fremont.

JAMES WALTER LINN, B.S., Instructor in Dairy Husbandry, Division of College Extension (May 1, 1924).
B. S., K. S. A. C., 1915. Ag 147; R. R. 2.

EARL MILO LITWILLER, B.S., Instructor in Horticulture, Home Study Service, Division of College Extension (June 1, 1924).
B. S., K. S. A. C., 1924. A 5; 1001 Bluemont.

CONIE CAROLINE FOOTE, B.S., Specialist in Foods and Nutrition, Division of College Extension (June 1, 1924).
B. S., K. S. A. C., 1921. A 36; 513 N. Sixteenth.

JOHN WALLACE LUMB, D. V. M., Instructor in Veterinary Medicine, Division of College Extension (July 1, 1924).
D. V. M., K. S. A. C., 1910. V 31; 913 Vattier.

HENRY EVERT WICHERS, M. S., Instructor in Rural Architecture (July 1, 1924).
B. S. in Arch., K. S. A. C., 1924; M. S. in Arch., ibid., 1925.
E 224; 806 Leavenworth.

HAROLD HEDGES, A. M., Instructor in Marketing (July 15, 1924).
B. S., University of Nebraska, 1921; A. M., ibid., 1924. Ag 345; 1203 Moro.

PEARL HALL MCBURNEY,[10] Instructor in Shop Practice (Aug. 11, 1924).
S 37; 1419 Laramie.

ROSE FINLEY MACK,[10] B. S., Instructor in Clothing and Textiles, Division of College Extension (Aug. 16-Dec. 15, 1924).
B. S., Kansas State Teachers College, Emporia, 1924.

EMILY MAY BENNETT, M. S., Instructor in Food Economics and Nutrition (1922; Sept. 1, 1924).
A. B., University of Illinois, 1921; M. S., K. S. A. C., 1924. L 34; 830 Bertrand.

RUTH EMILIE SCOTT, B. M., Instructor in Voice (1923; Sept. 1, 1924).
B. M., K. S. A. C., 1923. MA 1; 1320 Fremont.

MILDRED HAZEL THORNBURG, B. M., Instructor in Piano (1923; Sept. 1, 1924).
B. M., K. S. A. C., 1923. MA 2; 1645 Laramie.

MADALYN AVERY, B. S., Instructor in Physics (Sept. 1, 1924).
B. S., K. S. A. C., 1924. C 36; 1619 Osage.

JOHN MACDONALD BARSTOW, M. S., Instructor in Physics (Sept. 1, 1924).
B. S., Washburn College, 1923; M. S., University of Kansas, 1924.
C 57; 1223 Poyntz.

MARY BIGELOW BROWNELL, A. M., Instructor in Modern Languages (Sept. 1, 1924).
A. B., University of Nebraska, 1921; A. M., University of Illinois, 1924.
A 71; 1605 Leavenworth.

JAMES PHILIP CALLAHAN, B. S., Instructor in English (Sept. 1, 1924).
B. S., Kansas State Teachers College, Hays, 1919. A 58; 715 Houston.

LAURA ROSALIND GIFFORD,[10] Instructor in Household Economics (Sept. 1, 1924).
T 52; 1641 Laramie.

WILLARD BRYANT HAFFORD, M. S. M. E., Instructor in Machine Design (Sept. 1, 1924).
B. S. M. E., Ohio State University, 1920; M. S. M. E., Purdue University, 1924.
S 51; 1116 Bluemont.

JOHN FREDERICK HELM, JR., B. D., Instructor in Freehand Drawing (Sept. 1, 1924).
B. D., Syracuse University, 1924. E 308; 1116 Bluemont.

BENJAMIN WILLIAM LAFENE, B. S., Instructor in Bacteriology (Sept. 1, 1924).
B. S., Michigan Agricultural College, 1923. V 52; 1416 Humboldt.

EARL GEORGE MCDONALD, A. M., Instructor in Public Speaking (Sept. 1, 1924).
A. B., University of Illinois, 1923; A. M., ibid., 1924. G 55; 1020 Leavenworth.

LAWSON FRANCIS MARCY, A. B., Instructor in Chemistry (Sept. 1, 1924).
A. B., Evansville College, 1924. W 30; 1012 Pierre.

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10. Temporary appointment.

ETHEL JUSTIN MARSHALL, B.S., Instructor in Home Economics, Home Study Service, Division of College Extension (Sept. 1, 1924).
B. S., K. S. A. C., 1910. A 5; 1529 Humboldt.

OLIVER MASSENGALE, M.S., Instructor in Chemistry (Sept, 1, 1924).
B. S., Alabama Polytechnic Institute, 1918; M. S., Iowa State College, 1924.
W 29; 1116 Bluemont.

GEORGE DAVID PALMER, JR., Ph.D., Instructor in Organic Chemistry (Sept. 1, 1924).
B. S., Clemson College, 1919; A. M., Johns Hopkins University, 1921; Ph. D., ibid., 1924.
C 64; 1116 Bluemont.

HARRIET SHIPLEY PARKER, A. M., Instructor in English (Sept. 1, 1924).
A. B., University of Kansas, 1909; A. M., Washington University, 1912.
A 53; 1641 Fairchild.

WILLIAM HUGH RIDDELL, B.S.A., Instructor in Dairy Husbandry (Sept. 1, 1924).
B. S. A., University of British Columbia, 1924. Ag 145; 1116 Bluemont.

LEO SPURRIER, A.M., Instructor in Economics (Sept. 1, 1924).
A. B., University of Kansas, 1923; A. M., ibid., 1924. A 74; 1923 Leavenworth.

ROBERT EDWARD SUMMERS, B.S., Instructor in Applied Mechanics (Sept. 1, 1924).
B. S., Oregon Agricultural College, 1924. E 113; 1116 Bluemont.

HELEN IRENE BROWN, B.S., Loan Assistant in Library (Sept. 10, 1924).
B. S., Simmons College, 1924. F 26; 326 N. Sixteenth.

SUZANNE PASMORE, Instructor in Piano (Oct. 24, 1924).
MA 6; 1318 Fremont.

GEORGIANA SMURTHWAITE, B.S., Instructor in Foods and Nutrition, Division of College Extension (Dec. 12, 1924).
B. S., Utah Agricultural College. A 36; ————.

MAUD ELIZABETH DEELY, B.S., Instructor in Clothing and Textiles (1923; Jan. 1, 1925); Clay County Home Demonstration Agent, Division of College Extension (1923-Dec. 31, 1924).
B. S., K. S. A. C., 1923.

RAY RALPH WICK, B.S., Instructor in Landscape Gardening, Division of College Extension (Jan. 1, 1925).
B. S., University of Kansas, 1910. H 33; 349 N. Fourteenth.

FRANCIS DALE PUGH, Sergt. Inf., U. S. A., Instructor in Military Science and Tactics (Jan. 11, 1925).
N 26; 826 Vattier.

IRVIN CECIL BROWN, M.S., Instructor in Chemistry (Feb. 2, 1925).
B. S., Tarkio College, 1920; M. S., University of Iowa, 1921. D 30; 1116 Bluemont.

## ASSISTANTS

FRANK ANDREW DAWLEY, B.S., Field Supervisor of Federal Vocational Trainees, Division of College Extension (1917; Aug. 16, 1923).
B. S., K. S. A. C., 1895. A 2; 303 N. Fourteenth.

ALANSON LOLA HALLSTED, B.S., Assistant in Dry Farming, Fort Hays Branch Agricultural Experiment Station (1910).
B. S., K. S. A. C., 1903. Hays, Kan.

NELLIE MAY, Postmistress (1911).
A 44; R. F. D. 2.

HATTIE HELEN WHITE, Secretary, Business Office (1912).
A 27; 717 Laramie.

ROBERT GETTY,[7] B. S. A., Assistant in Forage Crops, Fort Hays Branch Agricultural Experiment Station (1913).
B. S. A., University of Nebraska, 1913. Hays, 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, Assistant in Agronomy (1917); Foreman of Agronomy Farm (1917).
Graduate, Topeka Business College, 1903. Agronomy Farm.

MARY KIMBALL, B. S., Assistant to the Registrar (1918).
B. S., K. S. A. C., 1907. A 29; 1311 Laramie.

MYRTLE EVELYN ZENER, Secretary to the Vice President (1918).
A 49; 1423 Fairchild.

CHESTER WILLIS OAKES, Miller, Department of Milling Industry (1918).
Ag 26C; 1326 Houston.

LOUISE SCHWENSEN, Secretary to the Dean, Division of Engineering (1915, 1918).
E 115; 1800 Fairchild.

BRUCE BUNYAN SMITH, Assistant in Agricultural Engineering (1918).
Bks. 2; 830 Laramie.

ALICE MAUDE MELTON, B. S., Secretary to the Dean, Division of General Science (1900, 1919).
B. S., K. S. A. C., 1898. A 49; 1637 Osage.

JOHN VICTOR ROLANDER, Assistant in Heat and Power (1919).
E 27; 517 Kearney.

EDWARD L. CLAEREN, Major, U. S. R., Supply Officer, Department of Military Science and Tactics (1910, 1919).
N 27; 900 Pierre.

MARY ELVA CROCKETT, Secretary to the Dean, Division of Home Economics (1919).
L 29; 1418 Colorado.

GRACE ELLEN UMBERGER, B. S., R. N., Head Nurse, Department of Student Health (1919).
B. S., K. S. A. C., 1905; R. N., Illinois Training School for Nurses, 1909.
A 65; 1109 Kearney.

7. In coöperation with the U. S. Department of Agriculture.

ARTHUR FRITHIOF SWANSON, B. S., Assistant in Cereal Investigations, Fort Hays Branch Agricultural Experiment Station (1919).
B. S., K. S. A. C., 1919. Hays, Kan.

DELFA MARY HAZELTINE, Secretary to the Dean, Division of College Extension (1920).
Graduate, Lawrence Business College. A 33; 817 Poyntz.

CHARLES OTIS JOHNSON,[7] M. S., Assistant Plant Pathologist, Agricultural Experiment Station (1920).
B. S., K. S. A. C., 1918; M. S., K. S. A. C., 1923. H 53; 1323 Laramie.

RUTH COOLEY, B. S., Secretary to Dean of the Summer School (1918, 1920).
B. S., K. S. A. C., 1906. A 27; Eighteenth and Fairchild.

CLARENCE OSBORN PRICE, Assistant to the President (1920).
G 28; 412 Moro.

RALPH DALE NICHOLS, B. S., Research Assistant in Agricultural Economics (1920).
B. S., K. S. A. C., 1920. McPherson, Kan.

DONALD DEWITT WILSON, Nurseryman, Fort Hays Branch Agricultural Experiment Station (1921).
Hays, Kan.

KENNETH MILLER RENNER, B. S., Assistant in Dairy Husbandry (1921).
B. S., Iowa State College, 1921. Ag 155; 1127 Kearney.

JOSEPH FARRINGTON MERRILL, B. S., Assistant Chemist, Agricultural Experiment Station (1921).
B. S., University of Maine, 1907. C 3; 318 N. Sixteenth.

JAMES HERBERT MOYER,[7] B. S., Assistant in Agricultural Economics (1921).
B. S., K. S. A. C., 1921. Courthouse, Holton, Kan.

SARAH ELIZABETH TRACY, Secretary to the President (1922).
A 30; 328 Leavenworth.

FLOYD JOSEPH HANNA, Assistant in Department of Illustrations (1922).
I; 1612 Leavenworth.

EMBERT HARVEY COLES,[7] B. S., Assistant in Dry-land Agriculture Investigations, Garden City Branch Agricultural Experiment Station (1922).
B. S., K. S. A. C., 1922. Garden City, Kan.

KATHERINE FAULCONER, Assistant to Registrar (1922).
A 29; 1016 Pierre.

CLARA LISSETTE OTT, Assistant to Registrar (1922).
A 29; 1311 Laramie.

MINNIE SCOTT, R. N., Nurse, Department of Student Health (1922).
R. N., University Hospital, Kansas City, Mo., 1906. College Hospital.

MYRA ISABELLA WADE, A. B., Assistant in Physical Education for Women (1922).
A. B., Oberlin College, 1917. N 1; 1425 Laramie.

JOHN ALEXANDER MUNRO,[6] B. S. A., Assistant in Apiculture (1923-Jan. 31, 1925).
B. S. A., Ontario Agricultural College, 1922. AB; 1409 Anderson.

SAMUEL PICKARD, B. S., Extension Editor (1923).
B. S., K. S. A. C., 1923. A 33; 1723 Leavenworth.

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6. Resigned.
7. In coöperation with the U. S. Department of Agriculture.

GERTRUDE MYRTLE COLLIER, Matron and Dietitian in College Hospital (1924).
College Hospital.

RUTH ROOT, R. N., Nurse, Department of Student Health (1924).
R. N., Stormont Training School, 1923. College Hospital.

JAY WEBSTER STRATTON, B. S., Field Supervisor of Vocational Trainees (1924).
B. S., K. S. A. C., 1916. A 2; 1725 Anderson.

MURRAY ALDERSON WILSON,[7] B. S. in C. E., Research Assistant in Coöperative Investigations on Atmospheric Resistance to Movement of Motor Vehicles (March 1, 1924).
A. B., Baker University, 1916; B. S. in C. E., K. S. A. C., 1922. E 16; 1709 Anderson.

WALTER JOHN BURTIS, B. S., Field Supervisor of Federal Vocational Trainees, Division of College Extension (April 1, 1924).
B. S., K. S. A. C., 1887. A 2; R. R. 1.

ALBERT B. CHARLES, Deputy Dairy Commissioner (April 8, 1924).
X 26; ——.

CLARA MAGDALENE SIEM, Financial Secretary, Division of College Extension (1920; July 1, 1924).
A 33; 601 N. Sixteenth.

WALTER HENRY VON TREBRA, B. S., Scientific Assistant, Colby Branch Agricultural Experiment Station (Aug. 1, 1924).
B. S., K. S. A. C., 1924. Colby, Kan.

HARRY RAY BRYSON, M. S., Assistant Entomologist, Agricultural Experiment Station (Sept. 1, 1924).
B. S., K. S. A. C., 1917; M. S., ibid., 1924. F 79C; 1019 Vattier.

VIDA AGNES HARRIS,[2] B. S., Assistant in Applied Art (Sept. 1, 1924).
B. S., K. S. A. C., 1914. A 68; R. R. 1.

FREDERICK EARL EMERY, D. V. M., Assistant Mammalogist, Agricultural Experiment Station (1923).
D. V. M., K. S. A. C., 1923. F 54A; 1001 Vattier.

ANDREW EDWARD OMAN,[7] M. F., Specialist in Rodent Control, Division of College Extension (1923).
B. S., K. S. A. C., 1900; M. F., Yale University, 1906. A 34; 215 N. Juliette.

BERTHA LEWIS DANHEIM, M. S., Assistant in Parasitology (1921, 1923).
B. S., K. S. A. C., 1920; M. S., ibid., 1923. F 59; 830 Lamarie.

FLORENCE LILLIAN DIAL, B. S., Class Reserves Assistant in Library (1923).
B. S., K. S. A. C., 1919. F 3; 1030 Moro.

FRED FOSTER GREELEY, Assistant in Shop Practice (1923).
S 30; 1010 Fremont.

WILLIAM HENRY IRWIN, Assistant in Shop Practice (1923).
S 29; R. R. 2.

REBECCA SALOME MEYER, R. N., Nurse in College Hospital (1923).
Graduate, Mary Thompson Hospital, Chicago, 1900. College Hospital.

GENEVA GRACE WATSON, B. S., Assistant in Physical Education for Women (1923).
B. S., University of Chicago, 1921. N 3; 1517 Leavenworth.

GRACE MAY JORDAN, R. N., Nurse, Department of Student Health (1923).
R. N., Stormont Hospital, Topeka, 1922. A 65; College Hospital.

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2. Appointed for the year 1924-'25.
7. In coöperation with the U. S. Department of Agriculture.

ROY MOORE, Specialist in Rodent Control Work (1923).
A 34 A; 910 Poyntz.

BEATRICE GATES, A. B., Secretary to Dean of Women (Jan. 1, 1924).
A. B., University of Iowa, 1923. A 40; 322 N. Seventeenth.

PIERRE ALPHONSE MILLER,[2] B. S., Assistant in Botany (Sept. 1, 1924).
B. S., Oregon Agricultural College, 1924. H 76; 1819 Leavenworth.

MORSE HENDERSON SALISBURY, B. S., Assistant in Industrial Journalism and Printing (Sept. 1, 1924).
B. S., K. S. A. C., 1924. K 27; 821 Humboldt.

ELMA RUTH STEWART, B. S., Assistant in Household Economics (Sept. 1, 1924).
B. S., K. S. A. C., 1921. T 29; 1116 Laramie.

ROBERT A. STAHWIEN,[6] Assistant to the Superintendent, Fort Hays Agricultural Experiment Station (Sept. 15, 1924-Jan. 9, 1925).

CARRIE ISABEL POTTER, M. S., Assistant in Genetics, Department of Zoölogy (Oct. 1, 1924).
B. S., Ottawa University, 1922; M. S. University of Iowa, 1924.
Insectary; 930 Laramie.

WALTER R. WEAVER, Assistant to Superintendent, Fort Hays Branch Agricultural Experiment Station (Jan. 10, 1925).
Hays, Kan.

ORPHA MAUST, M. S., Assistant in Education (Feb. 1, 1925).
B. S., K. S. A. C., 1922; M. S., ibid., 1923. G; 1413 Laramie.

MARIA MORRIS,[10] B. S., Assistant in Applied Art (Feb. 1-June 1, 1925).
B. S., K. S. A. C., 1911. A 67; 816 N. Juliette.

FRANK HAROLD COLLINS, B. S., Assistant Chemist, Agricultural Experiment Station (Feb. 9, 1925).
B. S., K. S. A. C., 1920. C 3; 1031 Humboldt.

## SUPERINTENDENTS

LOUIS C. AICHER, B. S., Superintendent, Fort Hays Branch Agricultural Experiment Station (1921).
B. S. in Agr., K. S. A. C., 1910. Hays, Kan.

JACOB LUND, M. S., Superintendent of Heat and Power (1893, 1901); Custodian of Buildings and Grounds (1893, 1917).
B. S., K. S. A. C., 1883; M. S., ibid., 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; 1328 Fremont.

GEORGE RICHARD PAULING, Superintendent of Building and Repair (1916, 1919).
S 34; 1030 Humboldt.

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.

BENJAMIN FRANCIS BARNES, B. S., Superintendent, Colby Branch Agricultural Experiment Station (1921).
Colby, Kan.

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2. Appointed for the year 1924-'25.
6. Resigned.
10. Temporary appointment.

THOMAS BRUCE STINSON, B. S., Superintendent, Tribune Branch Agricultural Experiment Station (April 15, 1924).
B. S., K. S. A. C., 1924. Tribune, Kan.

## AGRICULTURAL AGENTS[7]

EVEREST JOHN MACY, B. S., Sedgwick County Agricultural Agent, Division of College Extension (1913, 1918).
B. S., Earlham College, 1904. Wichita, Kan.

FLOYD JOE ROBBINS, B. S., Franklin County Agricultural Agent, Division of College Extension (1917).
B. S., K. S. A. C., 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.

EDWARD H. LEKER, B. S. A., Leavenworth County Agricultural Agent, Division of College Extension (1918, 1922).
B. S. A., University of Missouri, 1917. Leavenworth, Kan.

HERBERT LYNNE HILDWEIN, B. S., Kingman County Agricultural Agent, Division of College Extension (1917, 1918).
B. S., K. S. A. C., 1914. Kingman, Kan.

HAYS MARION COE, Montgomery County Agricultural Agent, Division of College Extension (1918).
Independence, Kan.

JOE MYRON GOODWIN, Atchison County Agricultural Agent, Division of College Extension (1919, 1923).
Effingham, Kan.

CHARLES ELMER CASSEL, B. S., Butler County Agricultural Agent, Division of College Extension (1912, 1923).
B. S., K. S. A. C., 1910. Lyndon, Kan.

ALBERT BARNEY KIMBALL, B. S., Harvey County Agricultural Agent, Division of College Extension (1918, 1920).
B. S., K. S. A. C., 1889. Newton, Kan.

ROBERT ELLIOTT CURTIS, B. S., Ottawa County Agricultural Agent, Division of College Extension (1919; Jan. 15, 1924); Clay County Agricultural Agent, Division of College Extension (1919-Dec. 31, 1923).
B. S., K. S. A. C., 1916. Minneapolis, Kan.

HERMAN FREDERICK TAGGE, B. S., Jackson County Agricultural Agent, Division of College Extension (1920, 1923).
B. S., K. S. A. C., 1914. Holton, Kan.

JOHN ALBERT HENDRIKS, B. S. A., Anderson County Agricultural Agent, Division of College Extension (1920; Nov. 1, 1924).
B. S. A., Iowa State College, 1913. Garnett, Kan.

ERNEST LEE MCINTOSH, B. S., Osage County Agricultural Agent, Division of College Extension (1920; Aug. 7, 1923).
B. S., K. S. A. C., 1920. Lyndon, Kan.

HARRY CHARLES BAIRD, B. S., Ford County Agricultural Agent, Division of College Extension (1920).
B. S., K. S. A. C., 1914. Dodge City, Kan.

7. In coöperation with the U. S. Department of Agriculture.

CLARENCE OWEN GRANDFIELD, B. S., Bourbon County Agricultural Agent, Division of College Extension (1920; Nov. 1, 1923); Wilson County Agricultural Agent, Division of College Extension (1920-Oct. 31, 1923).
B. S., K. S. A. C., 1917. Fort Scott, Kan.

ARTHUR I. GILKISON, Rice County Agricultural Agent, Division of College Extension (1920, 1923).
Lyons, Kan.

CARL CARLSON, A. B., Rawlins County Agricultural Agent, Division of College Extension (1920, 1922).
A. B., Southwestern College, 1914. Atwood, Kan.

CARL LEWIS HOWARD, B. S., Pawnee County Agricultural Agent, Division of College Extension (1920, 1922).
B. S., K. S. A. C., 1920. Larned, Kan.

KYLE DAVID THOMPSON,[6] B. S., Jewell County Agricultural Agent, Division of College Extension (1920, 1922-Oct. 31, 1924).
B. S., K. S. A. C., 1920. Mankato, Kan.

ARTHUR LEROY MYERS, B. S., Marion County Agricultural Agent, Division of College Extension (1920).
B. S., K. S. A. C., 1920. Marion, Kan.

CECIL LYMAN MCFADDEN, B. S., Lyon County Agricultural Agent, Division of College Extension (1920).
B. S., K. S. A. C., 1918. Emporia, Kan.

ROY ELMER GWIN, B. S., Allen County Agricultural Agent, Division of College Extension (1921; July 1, 1924).
B. S., K. S. A. C., 1914. Iola, Kan.

JOHN VERN HEPLER, B. S., Washington County Agricultural Agent, Division of College Extension (1921).
B. S., K. S. A. C., 1916. Washington, Kan.

PAUL BERNARD GWIN, B. S., Morris County Agricultural Agent, Division of College Extension (1921).
B. S., K. S. A. C., 1916. Council Grove, Kan.

CHESTER EUGENE GRAVES, B. S., Wyandotte County Agricultural Agent, Division of College Extension (1921, 1923).
B. S., K. S. A. C., 1920. Kansas City, Kan.

WILLIAM LOUIS TAYLOE, B. S. A., Crawford County Agricultural Agent, Division of College Extension (1921).
B. S. A., University of Missouri, 1917. Council Grove, Kan.

JOHN JERRY INSKEEP, B. S., Sumner County Agricultural Agent, Division of College Extension (1921, 1923).
B. S., Purdue University, 1921. Wellington, Kan.

ROLLA WADE MCCALL, B. S., Reno County Agricultural Agent, Division of College Extension (1921; Sept. 22, 1924).
B. S., K. S. A. C., 1921. Hutchinson, Kan.

CHARLES HAROLD STINSON, B. S., Pratt County Agricultural Agent, Division of College Extension (1921, 1923).
B. S., K. S. A. C., 1921. Pratt, Kan.

CLARENCE SMITH MERYDITH,[6] B. S., Meade County Agricultural Agent, Division of College Extension (1921; Dec. 31, 1924).
B. S., Oklahoma A. and M. College, 1912. Meade, Kan.

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6. Resigned.

CLARENCE ROY JACCARD, B.S., Clay County Agricultural Agent, Division of College Extension (1922; April 1, 1924).
B. S., K. S. A. C., 1914. Clay Center, Kan.

ROBERT E. WILLIAMS, B.S., Barton County Agricultural Agent, Division of College Extension (1922).
B. S., K. S. A. C., 1907. Great Bend, Kan.

JOHN B. PETERSON, Johnson County Agricultural Agent, Division of College Extension (1922; Aug. 15, 1924).
Olathe, Kan.

HARRY CLIFFORD COLGLAZIER, B.S., Douglas County Agricultural Agent, Division of College Extension (1922).
B. S., K. S. A. C., 1918. Lawrence, Kan.

WILLIAM HERBERT ROBINSON, B. S., Jefferson County Agricultural Agent, Division of College Extension (1923).
B. S., K. S. A. C., 1916. Oskaloosa, Kan.

CLARENCE EUGENE AGNEW, B.S., Wilson County Agricultural Agent, Division of College Extension (1923, 1924).
B. S., K. S. A. C., 1923. Fredonia, Kan.

LOUIS MEYERS KNIGHT, B.S., Gray County Agricultural Agent, Division of College Extension (1923).
B. S., K. S. A. C., 1923. Cimarron, Kan.

CHARLES ENOCH LYNESS, B.S., Doniphan County Agricultural Agent, Division of College Extension (1923).
B. S., K. S. A. C., 1912. Troy, Kan.

FRED WALLACE CALDWELL, D. V. M., Finney County Agricultural Agent, Division of College Extension (1923).
D. V. M., K. S. A. C., 1907. Garden City, Kan.

E. BRUCE BRUNSON, M.S.A., Cheyenne County Agricultural Agent, Division of College Extension (1923).
B. S., Hobart College, 1911; M. S. A., Cornell University, 1914. St. Francis, Kan.

RAY LEIGHTON GRAVES, B.S., Hodgeman County Agricultural Agent, Division of College Extension (1923).
B. S., K. S. A. C., 1912. Jetmore, Kan.

GEORGE W. SIDWELL, A.B., Ness County Agricultural Agent, Division of College Extension (1918, 1923).
A. B., Fairmount College, 1915. Ness City, Kan.

WILLIAM HAROLD METZGER, B.S., Shawnee County Agricultural Agent, Division of College Extension (1923; Apr. 18, 1924).
B. S., Purdue University, 1922. Topeka, Kan.

SAMUEL DAVID CAPPER, B.S., Lincoln County Agricultural Agent, Division of College Extension (1923).
B. S., K. S. A. C., 1921. Lincoln, Kan.

DONALD BRYAN IBACH, B.S., Rush County Agricultural Agent, Division of College Extension (1923).
B. S., K. S. A. C., 1923. La Crosse, Kan.

MOTT LUTHER ROBINSON, B.S., McPherson County Agricultural Agent, Division of College Extension (1923).
B. S., K. S. A. C., 1923. McPherson, Kan.

HERMAN ALBERT BISKIE, B.S., Nemaha County Agricultural Agent, Division of College Extension (1923).
B. S., University of Nebraska, 1917. Seneca, Kan.

JUNIUS WARREN FARMER, B. S., Greenwood County Agricultural Agent, Division of College Extension (1923).
B. S., K. S. A. C., 1923. Eureka, Kan.

GILBERT LYNN CLELAND, B. S., Sherman County Agricultural Agent, Division of College Extension (1923).
B. S., K. S. A. C., 1914. Goodland, Kan.

SAMUEL JOSEPH SMITH,[6] B. S., Cloud County Agricultural Agent, Dvision of College Extension (1923-Dec. 31, 1924).
B. S., K. S. A. C., 1920. Concordia, Kan.

WILLIAM O'CONNELL, B. S., Marshall County Agricultural Agent, Division of College Extension (1924).
B. S., K. S. A. C., 1916. Marysville, Kan.

HERBERT MOSS, B. S. A., Labette County Agricultural Agent, Division of College Extension (April 16, 1924).
B. S. A., Purdue University, 1920. Altamont, Kan.

HORATIO WILLIAM KING, B. S. A., Dickinson County Agricultural Agent, Division of College Extension (May 16, 1924).
B. S. A., Purdue University, 1920. Abilene, Kan.

DANIEL MATTHEW BRAUM, B. S. in Agr., Coffey County Agricultural Agent, Division of College Extension (June 1, 1924).
B. S. in Agr., K. S. A. C., 1924. Burlington, Kan.

RALPH REUBEN MCFADDEN, B. S. in Agr., Clark County Agricultural Agent, Division of College Extension (July 16, 1924).
B. S. in Agr., K. S. A. C., 1921. Ashland, Kan.

JOSEPH DANIEL BUCHMAN, B. S. in Agr., Miami County Agricultural Agent, Division of College Extension (Oct. 1, 1924).
B. S. in Agr., K. S. A. C., 1924. Paola, Kan.

HOWARD LORAIN GIBSON, B. S., Cherokee County Agricultural Agent, Division of College Extension (Nov. 1, 1924).
B. S., Iowa State College, 1923. Columbus, Kan.

LEWIS LESLIE PERRY,[6] B. S., Comanche County Agricultural Agent, Division of College Extension (Oct. 1, 1924-Jan. 7, 1925).
B. S., Oklahoma A. and M. College, 1923. Coldwater, Kan.

CLARENCE GLADFELTER, B. S. in Agr., Chase County Agricultural Agent, Division of College Extension (Nov. 1, 1924).
B. S. in Agr., K. S. A. C., 1924. Cottonwood Falls, Kan.

DWIGHT ELLSWORTH HULL, B. S. in Agr., Jewell County Agricultural Agent, Division of College Extension (Nov. 24, 1924).
B. S. in Agr., K. S. A. C., 1917. Mankato, Kan.

LEONARD NEFF, B. S. A., Cloud County Agricultural Agent, Division of College Extension (Feb. 1, 1925).
B. S. A., Purdue University, 1922. Concordia, Kan.

JOHN EVANS NORTON, B. S. in Agr., Meade County Agricultural Agent, Division of College Extension (Feb. 5, 1925).
B. S. in Agr., K. S. A. C., 1925. Meade, Kan.

HARRY ELIJAH RATCLIFFE, M. S., Comanche County Agricultural Agent, Division of College Extension (Mar. 10, 1924).
B. S., K. S. A. C., 1923; M. S., ibid., 1925. Coldwater, Kan.

6. Resigned.

EDWARD AICHER, D. V. S., Harper County Agricultural Agent, Division of College Extension (Mar. 11, 1925).
D. V. S., Colorado State College, 1910. Anthony, Kan.

## HOME DEMONSTRATION AGENTS[7]

ETHEL MCDONALD, B. S., Bourbon County Home Demonstration Agent, Division of College Extension (1919; Jan. 15, 1925); Sedgwick County Home Demonstration Agent, Division of College Extension (1919-Jan. 14, 1925).
B. S., K. S. A. C., 1907. Fort Scott, Kan.

JULIA WALCOTT KIENE, Shawnee County Home Demonstration Agent, Division of College Extension (1920).
Graduate, Stout Institute. Topeka, Kan.

MAUDE MILDRED COE, B. S., Wyandotte County Home Demonstration Agent, Division of College Extension (1922).
B. S., K. S. A. C., 1902. Kansas City, Kan.

EDITH ANTONETTE HOLMBERG, B. S., Reno County Home Demonstration Agent, Division of College Extension (1922, 1924).
B. S., K. S. A. C., 1908. Hutchinson, Kan.

LILA SPENCER COE, Montgomery County Home Demonstration Agent, Division of College Extension (1923).
Independence, Kan.

NINA ELOISE HURLBERT, Franklin County Home Demonstration Agent, Division of College Extension (1924).
Ottawa, Kan.

CAROLINE RASINA KESLER,[6] A. B., Meade County Home Demonstration Agent, Division of College Extension (1924-Jan. 31, 1925).
A. B., Friends University, 1920. Meade, Kan.

HATTIE ABBOTT, B. S., Pratt County Home Demonstration Agent, Division of College Extension (June 1, 1924).
B. S., K. S. A. C., 1913. Pratt, Kan.

SARAH FRANCES SMITH, B. S., Cherokee County Home Demonstration Agent, Division of College Extension (Sept. 1, 1924).
B. S., K. S. A. C., 1923. Columbus, Kan.

ELIZABETH QUINLAN, M. S., Clay County Home Demonstration Agent, Division of College Extension (Jan. 12, 1925).
B. S., K. S. A. C., 1917; M. S., Columbia University, 1924. Clay Center, Kan.

MABEL ELLEN HINDS, B. S., Labette County Home Demonstration Agent, Division of College Extension (Jan. 15, 1925).
B. S. in H. E., K. S. A. C., 1917. Altamont, Kan.

MILDRED SMITH, B. S., Douglas County Home Demonstration Agent, Division of College Extension (Jan. 15, 1925).
B. S., K. S. A. C., 1923. Lawrence, Kan.

LAURA WINTER, Sedgwick County Home Demonstration Agent, Division of College Extension (Jan. 15, 1925).
Wichita, Kan.

MABEL MCMAHON, B. S., Meade County Home Demonstration Agent, Division of College Extension (Feb. 1, 1925).
B. S., University of Missouri, 1924. Meade, Kan.

FLORENCE DRESSER SYVERUD, B. S., Allen County Home Demonstration Agent, Division of College Extension (Feb. 1, 1925).
B. S., K. S. A. C., 1908. Iola, Kan.

6. Resigned.
7. In coöperation with the U. S. Department of Agriculture.

## COUNTY LEADERS IN BOYS' AND GIRLS' CLUB WORK

ELDORA MANN,[6] Brown County Club Agent, Division of College Extension (1923, Mar. 10-Nov. 10, 1924).
Hiawatha, Kan.

HELEN DUNLAP, B. S., Leavenworth County Club Agent, Division of College Extension (Feb. 11, 1924).
B. S., K. S. A. C., 1924. Leavenworth, Kan.

## GRADUATE ASSISTANTS

EDNA FLORENCE BANGS, B. S., Graduate Assistant in Bacteriology (1923).
B. S., K. S. A. C., 1923. V 53B; 1130 Bluemont.

OSCEOLA HALL BURR, B. S., Graduate Assistant in Public Speaking (1923).
B. S., K. S. A. C., 1923. G 55; 1811 Humboldt.

FRANK DANIELS RUPERT, B. S., Graduate Assistant in Agronomy (1923).
B. S., Washington State College, 1923. Ag 306; 1326 Fremont.

EVERETT MORRILL SCHRECK, B. S., Graduate Assistant in Botany (1923).
B. S., Kansas Wesleyan University, 1923. H. 77; 914 N. Manhattan.

FLOYD MAXWELL WRIGHT, B. S., Graduate Assistant in Dairy Husbandry (1923).
B. S., South Dakota State College, 1923. Ag 155; 518 Vattier.

GEORGE ALBERT FILINGER, B. S., Graduate Assistant in Horticulture (1924).
B. S., K. S. A. C., 1923. H 30; 1010 Laramie.

PAUL BALDWIN SAWIN, B. S., Graduate Assistant in Animal Husbandry (1924).
B. S., Cornell University, 1924. Ag 15A; 1737 Laramie.

HAROLD WILLIAM BROWN, A. B., Graduate Assistant in Zoölogy (Sept. 1, 1924).
A. B., Kalamazoo College, 1924. F 59; 1020 Bluemont.

ELMER CHEATUM, A. B., Graduate Assistant in Zoölogy (Sept. 1, 1924).
A. B., Southwestern College, 1924. F 8; Paddlefort Apts.

MARTIN FREDERICK FRITZ, B. S., Graduate Assistant in Education (Sept. 1, 1924).
B. S., K. S. A. C., 1924. G 34; 711 Fremont.

MAX MANLEY HOOVER, B. S. in Agr., Graduate Assistant in Agronomy (Sept. 1, 1924).
B. S. in Agr., K. S. A. C., 1924. Ag 312; 1326 Fremont.

LUCILE OSBORN RUST, B. S., Graduate Assistant in Household Economics (Sept. 1, 1924).
B. S., Kansas State Teachers College, Pittsburg, 1921. T 58; 908 Leavenworth.

MARY MARGARET SHAW, A. B., Graduate Assistant in Food Economics and Nutrition (Sept. 1, 1924).
A. B., Fairmount College, 1918. L 47; 900 Leavenworth.

JASON RICHARD SWALLEN, A. B., Graduate Assistant in Botany and Plant Pathology (Sept. 1, 1924).
A. B., Ohio Wesleyan University, 1924. H 76; Y. M. C. A.

LOLA BEATRICE VINCENT, B. S., Graduate Assistant in Zoölogy (Sept. 1, 1924).
B. S., K. S. A. C., 1924. F. 55; 354 N. Sixteenth.

JOHN PETER WILLMAN, B. S., Graduate Assistant in Animal Husbandry (Sept. 1, 1924).
B. S., Pennsylvania State College, 1924. Ag 24; 1106 Laramie.

6. Resigned.

JOHN MCKAY MOORE, B. S. A., Graduate Assistant in Poultry Husbandry (Sept. 15, 1924).
B. S. A., Ontario Agricultural College, 1923. Ag 252; 1116 Bluemont.

## OTHER OFFICERS

JESSIE MCDOWELL MACHIR, College Registrar (1913).
A 29; 1641 Fairchild.

RALPH LEON FOSTER, B.S., Alumni Secretary (1924).
B. S., K. S. A. C., 1922. A 11; 1023 Laramie.

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; 520 N. Manhattan.

LOIS WILDY, A.B., Secretary of the Young Women's Christian Association (Sept. 1, 1923).
A. B., University of Colorado, 1923. L 39; 326 N. Sixteenth.

FRANK HAROLD GULICK,[11] B.S., Coördinator, U.S. Veterans' Bureau (1922).
B. S., K. S. A. C., 1920.

STEPHEN ARNOLD GEAUQUE, Assistant Custodian (1918, 1919).
G 1; 1014 Laramie.

11. Transferred Feb. 1, 1925.

# Standing Committees of the Faculty

ADMISSION: Jessie McD. Machir, J. V. Cortelyou, B. L. Remick, Ina Holroyd, J. O. Hamilton, W. H. Andrews, H. L. Ibsen, J. H. Robert.

ADVANCED CREDIT: R. R. Price, L. E. Call, H. H. King, J. T. Willard, H. W. Davis, R. R. Dykstra, Martha Pittman, L. D. Bushnell.

ASSIGNMENT: Jessie McD. Machir, A. E. White, Araminta Holman, C. V. Williams, C. H. Scholer, W. E. Grimes.

ATHLETICS: F. D. Farrell, H. H. King, M. F. Ahearn, E. L. Holton, R. A. Seaton, R. I. Throckmorton.

CATALOGUE: J. V. Cortelyou, J. T. Willard, H. W. Davis.

COMMUNITY CHEST: W. H. Andrews, H. A. Shinn, Charlotte Swanson.

CONTROL: I. V. Iles, Albert Dickens, Margaret M. Justin; R. A. Seaton, R. R. Dykstra.

FACULTY LOAN FUND: J. V. Cortelyou, Mary P. Van Zile, R. R. Dykstra, L. E. Call, R. A. Seaton, Jessie McD. Machir.

GRADUATE STUDY: J. E. Ackert, L. E. Conrad, L. E. Call, H. H. King, R. K. Nabours, J. H. Burt, Margaret M. Justin.

MAJOR MUSICAL AND DRAMATIC ENTERTAINMENTS: J. C. Peterson, Ira Pratt, H. T. Hill, George Clammer, Wayne McKibbon, Harry Wilson, Helen Correll.

PUBLIC EXERCISES: J. E. Kammeyer, J. V. Cortelyou, Ira Pratt, H. W. Davis, E. L. Holton, W. H. Andrews.

SCHEDULE OF CLASSES: A. E. White, J. T. Willard, W. T. Stratton, L. E. Conrad, W. E. Grimes, Martha Pittman.

STUDENT AFFAIRS: Mary P. Van Zile, H. W. Davis, Albert Dickens, A. A. Holtz, H. H. King, Eric Englund, M. F. Ahearn, Lois Wildy, Myra Wade, H. A. Shinn, Grace R. Hesse, C. W. Colver.

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: Mary P. Van Zile, J. T. Willard, R. A. Seaton, R. R. Dykstra, E. L. Holton, Margaret M. Justin, L. E. Call.

# Agricultural Experiment Station

## OFFICERS OF THE STATION

W. M. JARDINE, President of the College

ADMINISTRATION—
F. D. FARRELL, Director
T. J. O'NEIL, Business Manager
HUGH DURHAM, Assistant to Director

AGRICULTURAL ECONOMICS—
W. E. GRIMES, Farm Organization, in Charge
ERIC ENGLUND, Land Economics
R. M. GREEN, Marketing
MORRIS EVANS, Farm Organization
J. A. HODGES, Farm Organization
HAROLD HEDGES, Marketing
R. D. NICHOLS, Farm Organization
J. H. MOYER, 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
J. W. ZAHNLEY, Crops
H. H. LAUDE, Coöperative Experiments
CHARLES R. ENLOW, Coöperative Experiments
G. H. PHINNEY, Farm Foreman
ELISABETH HARLING, Seed Analyst

ANIMAL HUSBANDRY—
C. W. MCCAMPBELL, in Charge
H. L. IBSEN, Animal Genetics
B. M. ANDERSON, Cattle Investigations
H. E. REED, Sheep Investigations
D. L. MACKINTOSH, Horse Investigations
A. D. WEBER, Swine Investigations
H. W. MARSTON, Animal Nutrition
C. E. AUBEL, Pasturing Experiments

BACTERIOLOGY—
L. D. BUSHNELL, in Charge
A. C. FAY, Dairy Bacteriology
P. L. GAINEY, Soil Bacteriology
W. R. HINSHAW, Poultry Disease Investigations

BOTANY—
L. E. MELCHER, Plant Pathology, in Charge
E. C. MILLER, Plant Physiology
R. P. WHITE, Plant Pathology

CHEMISTRY—
H. H. KING, in Charge
J. T. WILLARD, Consulting Chemist
W. L. LATSHAW, in Charge Analytical Laboratory
E. L. TAGUE, Protein Investigations
J. S. HUGHES, Animal Nutrition
R. W. TITUS, Feeding Stuffs Analysis
J. F. MERRILL, Fertilizer Analysis

DAIRY HUSBANDRY—
- J. B. FITCH, in Charge
- H. W. CAVE, Dairy Production
- N. E. OLSON, Dairy Manufactures
- W. H. RIDDELL, Official Testing

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
- ARTHUR H. HELDER, Landscape Gardening

MILLING INDUSTRY—
- C. O. SWANSON, in Charge
- EARL B. WORKING, Wheat and Flour Investigations
- C. W. OAKES, Milling

POULTRY HUSBANDRY—
- L. F. PAYNE, in Charge
- D. C. WARREN, Genetics
- H. H. STEUP, Poultry Production
- 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
- G. E. JOHNSON, 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
- E. H. COLES, Dry-land Agriculture Investigations[1]

COLBY—
- B. F. BARNES, Superintendent[1]

TRIBUNE—
- T. B. STINSON, 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
MARGARET M. JUSTIN, Director
WILHELMINA BATES, Institutional Administration
LILIAN BAKER, Clothing and Textiles
MARGARET M. JUSTIN, Sanitation and Public Health
MARTHA M. KRAMER, Food Economics and Nutrition
AMY JANE LEAZENBY-ENGLUND, Child Welfare
MARTHA S. PITTMAN, Food Economics

# Engineering Experiment Station

## OFFICERS OF THE STATION

W. M. JARDINE, President of the College

ADMINISTRATION—
R. A. SEATON, Director
LOUISE SCHWENSON, Secretary

APPLIED MECHANICS—
C. H. SCHOLER, in Charge
J. H. ROBERT, Hydraulic Machinery
E. R. DAWLEY, Materials of Construction
HAROLD ALLEN, Road Materials
R. E. SUMMERS, Road Materials

AGRICULTURAL ENGINEERING—
H. B. WALKER, in Charge
W. H. SANDERS, Tractors
R. H. DRIFTMIER, Farm Machinery
V. R. HILLMAN, General Investigations

ARCHITECTURE—
PAUL WEIGEL, in Charge
J. D. WALTERS, General Investigations
H. E. WICHERS, 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
*M. A. WILSON, Highway Engineering

ELECTRICAL ENGINEERING—
C. E. REID, in Charge
R. G. KLOEFFLER, General Investigations
R. M. KERCHNER, General Investigations
L. H. CHURCH, Rural Electrification

MACHINE DESIGN—
C. E. PEARCE, in Charge
M. A. DURLAND, General Investigations

MECHANICAL ENGINEERING—
J. P. CALDERWOOD, in Charge
A. J. MACK, General Investigations
B. B. BRAINARD, Assistant

PHYSICS—
J. O. HAMILTON, in Charge
G. E. RABURN, General Investigations
E. C. CONVERSE, General Investigations

* In coöperation with the Bureau of Public Roads, U. S. Department of Agriculture.

SHOP PRACTICE—

W. W. CARLSON, in Charge
G. A. SELLERS, General Investigations
E. C. JONES, Machine Tools
D. E. LYNCH, Forging Practice
RAY FLAGG, Automotive Engineering
E. C. GRAHAM, Shop Problems

# 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 course 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 Divison 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 street-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 147 acres, the College owns 1,399 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 more important buildings of the College are harmoniously grouped and are constructed of limestone obtained from the College quarries. These buildings are listed below.

ANDERSON HALL. Erected, 1879, 1883, and 1885; 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, English, Mathematics, and Modern Languages. It also contains the alumni and stadium offices.

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.

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 No. 1. 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 fire in 1900, the building was used from 1902 to 1911 as a women's gymnasium; since 1911, used by the Department of Chemistry.

CHEMISTRY ANNEX No. 2. Erected, 1904; cost, $15,000; dimensions, 72 x 103 feet; one story and basement. Occupied by the Department of Dairy Husbandry from the time of its erection till the fall of 1923, since which time it has been used by the Department of Chemistry. Value of equipment, $5,000.

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 used by the state dairy commissioner.

DENISON HALL. Erected, 1902; cost, $70,000; dimensions, 96 x 166 feet; two stories and basement. Occupied throughout by the laboratories, classrooms and offices of the Departments of Chemistry and Physics.

EDUCATION HALL. Erected, 1900; cost, $25,000; dimensions, 90 x 95 feet; two stories and basement. Occupies original site of the president's house, destroyed by lightning in 1896. Formerly housed the Departments of Agronomy and Animal Husbandry, later the Vocational School. The abolition of the latter brought change of name in the summer of 1924. Contains classrooms and offices of the Departments of Education and Public Speaking and offices of the custodian.

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, Machine Design, Mathematics, and Mechanical Engineering. The engines, turbines, generators and boilers that furnish heat, light and power for the College are also installed in this building.

ENGINEERING SHOPS. These consist of several connected structures, erected 1875, 1890, 1900 and 1905. The original building, now used as the woodworking shop, was erected in 1875; a series of additions having later been successively made, the present group is the result. Cost of the group, $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 the classrooms, drafting rooms, pattern storage room and offices of the Departments of Machine Design and Shop Practice. The woodworking shop (35 x 219 feet) is equipped with bench tools and woodworking machinery. Adjoining is the machine shop, amply equipped with modern machine tools. The blacksmith shop (50 x 100 feet) contains 48 forges of modern type, connected with power blast and down-draft exhaust. 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 contains 250 steel lockers. A general supply room (22 x 24 feet) is conveniently located for storing small supplies. One room is fitted up as model farm shop and is used in the training of teachers for rural communities in accordance with the Smith-Hughes requirements.

FAIRCHILD HALL. Erected, 1894; enlarged, 1903; 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 library reference rooms.

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 managers 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. The barn is used by the Department of Animal Husbandry.

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

It was originally designed as a College barn, and first used for that purpose. It has been used as a general College building, and successively by the Department of Botany and the Department of Veterinary Medicine. The first floor, a large hall, was used for many years as an armory by the Department of Military Science. The entire building is now used by the Department of Agricultural Engineering and contains modern types of farm machinery.

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.

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.

ILLUSTRATIONS HALL. Erected, 1876; 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.

INFIRMARY. Erected, previous to 1871; 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; has served its present use since 1919. Contains separate wards for men and women, five rooms in each ward.

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 Department of Industrial Journalism and Printing; second floor divided into general classrooms and offices used by the Department of English.

MEMORIAL STADIUM. West wing erected, 1922; east wing erected, 1924; cost of portions now completed, $118,000; cost of entire structure when completed as planned, $400,000. The seating decks are constructed of reinforced concrete, the end walls are built of limestone and the back walls will be of the same material. Capacity of the seating decks now standing, 15,000; capacity of the completed structure will be 22,500. The Stadium is being built as a memorial to alumni, students, former students, and faculty of the College who participated in the World War. The cost is met entirely from funds raised by popular subscription.

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 Science, 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, several literary society halls, and the radio broadcasting studio. This building is constructed on the old armory-castle type and is modern in every respect.

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.

VETERINARY HOSPITAL. Erected, 1923. Contract price, $118,000. The building is of stone and of fireproof construction throughout, with general dimensions of 145 x 146 feet. It consists of a central portion and two wings, and is two stories and an attic in height, with a basement under one of the wings. The building is used exclusively for the teaching of the practical phases of veterinary medicine and surgery. It is equipped for housing sick animals of all species, such as horses, cattle, sheep, swine, poultry, dogs, and cats. Its equipment includes an hydraulic elevator, large and small animal operating tables, cattle and horse stocks, dog kennels, operating rooms, laboratories for the diagnosis of animal diseases, etc. In addition, there are well-equipped rooms for senior students in veterinary medicine, together with a reception room for visitors, and offices for members of the veterinary clinical teaching staff.

WATERS HALL. East wing erected, 1912; west wing erected, 1923; cost of portions now completed, $500,000; cost of building when developed and completed as planned, $1,000,000. Each of the wings now completed is 80 feet wide and 169 feet long and four stories high. An 80 x 50 foot one-story annex on the east wing serves as a meats laboratory, and a similar annex on the west wing serves as a creamery. A stock-judging pavilion (45 x 100 feet) is located between the two wings and is divided into two large stock-judging rooms, each having a seating capacity of 475. The two wings and the stock-judging pavilion are used by the Departments of Agricultural Economics, Agronomy, Animal Husbandry, Dairy Husbandry, History, Milling Industry, Poultry Husbandry, and the general offices of the Agricultural Experiment Station and of the Division of Agriculture. The equipment includes an electrically operated flour mill capable of manufacturing 75 barrels of flour a day, a modern creamery, a well-equipped meats laboratory, and modern laboratories for instructional and investigative work in seed testing, market milk, soils, field crops, farm organization, grain grading, etc.

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

AUTO MECHANICS LABORATORIES. Erected, 1918; dimensions, 42 x 176 feet; two stories. Built for the S. A. T. C. as mess hall (barracks No. 5). The upper floor contains a large lecture hall which is used as an assembly room for the Division of Engineering. The main portion of the building is occupied by the repair and ignition sections of the auto mechanics laboratories.

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.

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 as a hospital for patients with contagious diseases.

GREENHOUSE. 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.

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.

REPAIR SHOP. Erected, 1918; dimensions, 40 x 176 feet; one story. Built as barracks No. 1 for the S. A. T. C. Occupied by the Department of Building and Repair.

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.

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.

POWER AND WATER SYSTEMS. The College maintains and operates its own modern heat, light, power, water and sewer systems. A central boiler plant of 2,900 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.

# 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, 1925, the Library contained 79,300 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, bilbiographies, 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 student 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.

# Student Health Service

The Department of Student Health was established in order to maintain good health among the students of the College. One doctor gives his entire time and three doctors devote part time to this service. The services of the College physicians are free, but the student may employ, at his own expense, any physician he may desire. Four nurses are employed on full time and the matron of the hospital also devotes all her time to student health needs.

The offices of the department are in Anderson Hall and are open to students each school day from 7:45 a. m. to 5 p. m. It is expected that students who have need of medical services and are able to walk will go to the office, unless there is a possibility that they have a contagious disease. Those who are unable to walk to the physician's office, or who have reason to believe that they have some contagion, should go to the hospital at once.

The College hospital is ready to receive students any hour of the day or night. Free hospital service is given for three days in each case of acute sickness except smallpox. After that period a charge of one dollar a day is made. Smallpox cases are not handled at the hospital except in cases where the disease has been contracted after proper vaccination against it. Patients are admitted to the hospital only on recommendation of the head of the College medical corps. Hospital service does not include major surgical cases, such as appendicitis, hernia, etc. If such a case develops while the student is in the hospital, he will be transferred, at his own expense, to a hospital of his choice. Treatment of chronic cases by the College physicians cannot be guaranteed. However, when practicable, treatment of such cases may be undertaken on the same basis as acute cases. Fractures and dislocations of a serious nature are not treated, but minor cases may be treated at the option of the head physician. Students with fractures are admitted to the hospital.

Standard hospital nursing service is furnished free, but the student may employ, at his own expense, a private nurse at any time he desires to do so. A private nurse must obey the same rules that the College nurses are expected to follow. No ambulance service is maintained by the College, as in practically all cases of beginning sickness patients are able to ride to the hospital in an ordinary conveyance.

In order to help control contagious diseases, a student absent from classes because of illness must, before he returns to his classes, secure from the College physician a return card showing him to be free from all such diseases.

Students have the privilege of consulting any of the College physicians at any time on any question of personal hygiene of whatsoever nature.

The health office observes the same vacations and holidays as the rest of the College. Students admitted to the hospital or remaining in the hospital at a time for which the sick-benefit fee has not been paid or during Christmas holidays, will be charged the actual cost of service.

The student health service is maintained by the sick-benefit fee fund. For data concerning this fee see the section on expenses, under General Information.

# 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. The student should send in advance or bring with him a certificate showing his high-school credits.

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

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; Accounting, three 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, including the fixed requirements. (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 (whether fixed or optional requirement) must be made up the first year that the student is in attendance. If the optional requirement is 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, geography, and reading, 12 weeks each, *or* | one unit. |
| | Two of these, eighteen weeks each | |
| | *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. | |
| | *Printing, one-half, one, or two units. | |
| | *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

All entrance deficiencies must be made up before the beginning of the sophomore year. All entrance subjects except physics may be made up by correspondence. Elementary Physics, Solid Geometry, and Algebra III may be taken in classes provided by the College.

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.

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.

## ADVANCED CREDIT

At the discretion of the president, students who present certificates showing credits for college work done in other acceptable 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 college 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.

Advanced credit in certain subjects of freshman rank may be secured by examination on account of surplus high-school units over and above the fifteen acceptable units required for admission. The registrar, on request, will furnish a statement of such surplus units to the Committee on Advanced Credit and that committee will conduct the examination within the first thirty days of

* 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.

the semester. Examinations, however, which affect the assignment of the first semester will be given the first Saturday of the first semester.

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

## ADMISSION

ADMISSION BY EXAMINATION. Examinations for admission will be held at the College on Monday, September 14, 1925; Monday, February 1, 1926; and Monday, June 7, 1926. 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 to 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 ASSIGNMENT

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 $5 will be charged those who are assigned after the time fixed for the close of registration unless they present to the president acceptable excuses 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.

Special students are subject to all of the general regulations and requirements of regular students, such as assignment to physical education and military training.

## KANSAS HIGH SCHOOLS AND ACADEMIES IN ACCREDITED RELATIONS WITH THE COLLEGE

(Graduates admitted without examination.)

Abbyville.
Abilene.
Ada.
Adams.
Admire.
Agenda.
Agra.
Alden.
Alexander.
Allen.
Alma.
Almena.
Altamont.
(Labette Co. H. S.)
Alta Vista.
Alton.
Altoona.
Americus.
Andover.
Anthony.
(Anthony H. S.)
(Spring Twp. H. S.)
Arcadia.
Argonia.
Arkansas City.
Arlington.
Arma.
Arnold.
Asherville.
Ashland.
Assaria.
Atchison.
(Atchison H. S.)
(St. Benedict's H. S.)
(Mount Saint Scholastica Academy.)
Athol.
Atlanta.
Attica.
Atwood.
Auburn.
Augusta.
Aurora.
Axtell.
(Axtell H. S.)
(St. Michael's H. S.)
Baldwin.
Bancroft.
Barclay.
Barnard.
Barnes.
Basehor.
Bavaria.
Baxter Springs.
Bazine.
Beattie.
Beeler.
Belle Plaine.
Belleville.
Belmont.
Beloit.
Belpre.
Belvue.
Bendena.
Benedict.
Bennington.
Bentley.
Benton.
Bern.
Berryton.
Beverly.
Bird City.
Bison.
Blaine.
Bloom.
Blue Mound.
Blue Rapids.
Bogue.
Bonner Springs.
Brewster.
(Brewster Con. H. S.)
(Brownsville Con. H. S.)
Bronson.
Brookville.
Brownell.
Bucklin.
Bucyrus.
(Bucyrus H. S.)
(Wea H. S.)
Buffalo.
Buhler.
Bunkerhill.
Burden.
Burdett.
Burdick.
(Diamond Valley R. H. S.)
Burlingame.
Burlington.
Burns.
Burr Oak.
Burrton.
Bushong.
Bushton.
Byers.
Caldwell.
Cambridge.
Caney.
Canton.
Carbondale.
Caneiro.
Cassoday.
Castleton.
Cawker City.
Cedar.
Cedar Point.
Cedar Vale.
Centerview.
Centralia.
Chanute.
Chapman.
(Dickinson Co. H. S.)
Chase.
Chautauqua.
Cheney.
Cherokee.
(Crawford Co. H. S.)
Cherryvale.
Chetopa.
Cimarron.
Circleville.
Claflin.
Clay Center.
(Clay Co. H. S.)
Clayton.
Clearwater.
Cleburne.
Clifton.
Climax.
Clyde.
Coats.
Codell.
Coffeyville.
Colby.
Coldwater.
Collyer.
Colony.
Columbus.
(Cherokee Co. H. S.)
Concordia.
Conway Springs.
Coolidge
Copeland.
Corning.
Cottonwood Falls.
(Chase Co. H. S.)
Council Grove.
Courtland.
Covert.
Cuba.
Cullison.
Culver.
Cunningham.
Deerfield.
Delavan.
Delia.
(Washington Twp. H. S.)
Delphos.
Denison.
Densmore.
Denton.
Derby.
De Soto.
Dexter.
Dighton.
(Lane Co. H. S.)
Dodge City.
(Dodge City H. S.)
(St. Mary of the Plains Academy.)
Dorrance.
Douglass.
Dover.
Downs.
Dunlap.
Durham.
Dwight.
Easton.
Edgerton.
Edmond.
Edna.
Edwardsville.
Effingham.
(Atchison Co. H. S.)
El Dorado.
Elk City.
Elk Falls.
Elgin.
Elkhart.
Ellinwood.
Ellis.
Ellsworth.
Elmdale.
Elsmore.
Elwood.
Emmett.
Emporia.
Englewood.
Ensign.
Enterprise.
Erie.
Esbon.
Eskridge.
Eudora.
Eureka.
Everest.
Fairview.
Fall River.
Falun.
Fellsburg.
Florence.
Ford.
Formoso.
Fort Scott.

Fowler.
Frankfort.
Franklin.
Fredonia.
Frontenac.
Fulton.
Galena.
Galesburg.
Galva.
Garden City.
Garden Plain.
Gardner.
Garfield.
Garnett.
Garrison.
Gaylord.
Gem.
Geneseo.
Girard.
Glasco.
Glendale.
Glen Elder.
(Athens R. H. S.)
Goddard.
Goff.
Goodland.
(Sherman Co. H. S.)
Gove.
Grainfield.
Great Bend.
Greeley.
Green.
Greenleaf.
Greensburg.
Grenola.
Gridley.
Grinnell.
Gypsum.
Haddam.
Halstead.
Hamilton.
Hamlin.
Hanover.
Hardtner.
Harlan.
Harper.
Hartford.
Harveyville.
Haven.
Havensville.
Haviland.
Hays.
(Hays H. S.)
(Girls' Catholic H. S.)
(Catholic College Academy.)
Hazelton.
Healy.
Hepler.
Herington.
Herndon.
Hiawatha.
Highland.
Hill City.
Hillsboro.
(Hillsboro H. S.)
(Tabor College Academy.)
Hoisington.
Holcomb.
Hollenberg.
Holton.
Holyrood.
Hope.
Horton.
Howard.
Hoxie.
Hoyt.
Hugoton.
(Stevens Co. H. S.)
Humboldt.
Hunter.
Hutchinson.
(Hutchinson H. S.)
(St. Teresa H. S.)
(So. Hutchinson H. S.)
Independence.
Ingalls.
Inman.
Iola.
Ionia.
Irving.
Isabel.
Jamestown.
Jarbalo.
Jennings.
Jetmore.
(Hodgeman Co. H. S.)
Jewell.
Johnson.
(Stanton Co. H. S.)
Junction City.
(Junction City H. S.)
(St. Xavier's H. S.)
Kackley.
Kanopolis.
Kanorado.
Kansas City.
(Argentine H. S.)
(Catholic H. S.)
(Central H. S.)
(State School for Blind.)
(Sumner H. S.)
(Western University Academy.)
(Wilson H. S.)
Keats.
Kensington.
Kincaid.
Kingman.
Kingsdown.
Kinsley.
Kiowa.
Kipp.
Kirwin.
Kismet.
La Crosse.
La Cygne.
Lafontaine.
La Harpe.
Lake City.
Lakin.
Lane.
Langdon.
Lansing.
Larned.
Latham.
Lawrence.
(Lawrence H. S.)
(Oread H. S.)
Leavenworth.
(Catholic H. S.)
(Leavenworth H. S.)
(St. Mary's Academy.)
Lebanon.
Lebo.
Lecompton.
Lehigh.
Lenora.
Leon.
Leona.
Leonardville.
Leoti.
(Wichita Co. H. S.)
Le Roy.
Levant.
Lewis.
Liberal.
Lincoln.
Lincolnville.
Lindsborg.
(Lindsborg H. S.)
(Bethany Academy.)
Linn.
Linwood.
Little River.
Logan.
Lone Elm.
Longford.
Long Island.
Longton.
Lorraine.
Lost Springs.
Louisburg.
Louisville.
Lovewell.
(Sinclair R. H. S.)
Lucas.
Luray.
Lyndon.
Lyons.
McCracken.
McCune.
McDonald.
McLouth.
McPherson.
(McPherson H. S.)
(Central College Academy.)
(McPherson College Academy.)
Macksville.
Madison.
Mahaska.
Maize.
Manhattan.
Mankato.
Maplehill.
Marion.
Marquette.
Marysville.
Mayetta.
Meade.
Medicine Lodge.
Melvern.
Menlo.
Meriden.
Merriam.
(Shawnee Mission R. H. S.)
Michigan Valley.
Milan.
Mildred.
Milford.
Miller.
Milton.
Miltonvale.
Minneapolis.
Minneola.
Moline.
Montezuma.
Montrose.
Monument.
Moran.
Morganville.
Morland.
Morrill.
Moscow.
Mound City.
Mound Ridge.
Mound Valley.
Mount Hope.
Mulberry.
(Mulberry H. S.)
(Cockerill H. S.)
Mullinville.
Mulvane.
Munden.
Muscotah.
Narka.
Nashville.

Natoma.
Neal.
Neodesha.
Neosho Falls.
Neosho Rapids.
Ness City.
Netawaka.
Newton.
Nickerson.
(Reno Co. H. S.)
Norcatur.
Norton.
(Norton Co. H. S.)
Nortonville.
Norway.
Norwich.
Oakland.
Oakley.
Oberlin.
(Decatur Co. H. S.)
Offerle.
Oketo.
Olathe.
Olsburg.
Onaga.
Oneida.
Osage City
Osawatomie.
Osborne
Oskaloosa.
Oswego.
Ottawa.
(Ottawa H. S.)
(Ottawa University Academy.)
Overbrook.
Overland Park.
Oxford.
Ozawkie.
Palco.
Paola.
(Paola H. S.)
(Ursuline Academy.)
Paradise.
Parker.
Parkerville.
Parsons.
Partridge.
Pawnee Rock.
Paxico.
Peabody.
Perry.
Peru.
Piedmont.
Pierceville.
Phillipsburg.
Piper.
Pittsburg.
(Pittsburg H. S.)
(Pittsburg College Academy.)
Plainville.
Plains.
Pleasanton.
Plevna.
Pomona.
(Appanoose H. S.)
(Pomona H. S.)
Portis.
Potter.
Potwin.
Powhattan.
Pratt.
Preston.
Prairie View.
Pretty Prairie.
Princeton.
Protection.
Quenemo.
Quincy.
Quinter.
Ramona.
Randall.
Randolph.
Ransom.
Rantoul.
Raymond.
Reading.
Reece.
Republic.
Reserve.
Rexford.
Richmond.
Riley.
Robinson.
Rock Creek.
Rolla.
Rosalia.
Rosedale.
Rose Hill.
Rossville.
Roxbury.
Rozel.
Russell.
Russell Springs.
Sabetha.
Saffordville.
(Toledo Twp. H. S.)
St. Francis.
(Dist. No. 93 H. S.)
(St. Francis Com. H. S.)
St. George.
St. John.
(St. John H. S.)
(Antrim R. H. S.)
St. Marys.
(St. Mary's H. S.)
(St. Mary's College Academy.)
(Immaculate Conception H. S.)
Salina.
(Salina H. S.)
(Sacred Heart Academy.)
(Marymount Academy.)
Satanta.
Savonburg.
Sawyer.
Scandia Twp.
Scott City.
(Scott Co. H. S.)
Scottsville.
Scranton.
Seaman.
(No. Topeka P. O.)
Sedan.
Sedgwick.
Selden.
Seneca.
(Seneca H. S.)
(St. Peter and St. Paul H. S.)
Severance.
Severy.
Sharon.
Sharon Springs.
Silver Lake.
Simpson.
Smith Center.
Smolan.
Soldier.
Solomon.
South Haven.
Sparks.
Spearville.
Spivey.
Spring Hill.
Stafford.
Stanley.
Stark.
Sterling.
Stilwell.
Stockdale.
Stockton.
Strawn.
Sublette.
Summerfield.
Sylvan Grove.
Sylvia.
Syracuse.
Tampa.
Tescott.
Thayer.
Tonganoxie.
Tonovay.
Topeka.
(Topeka H. S.)
(Catholic H. S.)
(Highland Park H. S.)
(Kansas Industrial and Educational Institute.)
(Washburn R. H. S.)
Toronto.
Towanda.
Tribune.
(Greeley Co. H. S.)
Trousdale.
Troy.
Turner.
Turon.
Tyro.
Udall.
Ulysses.
Uniontown.
Utica.
Valley Center.
Valley Falls.
Vermillion.
Vernon.
Vesper.
Vilas.
Vinland.
Viola.
Virgil.
Wakeeney.
(Trego Co. H. S.)
Wakefield.
Waldo.
Wallace.
Walnut.
Walton.
Wamego.
Washington.
Waterville.
Wathena.
Waverly.
Webber.
Webster.
Weir City.
Welda.
Wellington.
(Sumner Co. H. S.)
Wellsville.
Weskan.
Westmoreland.
Westphalia.
Wetmore.
Wheaton.
White City.
White Cloud.
Whitewater.
Whiting.
Wichita.
(Wichita H. S.)
(Cathedral H. S.)
(Mt. Carmel Academy.)
Williamsburg.
Willis.
Wilmore.
Wilsey.
Wilson.
Winchester.
Windom.
Winfield.
Winona.
Woodbine.
Woodson.
Yates Center.
Zenda.
Zook.

# 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. Not less than 20 semester hours of undergraduate work must be taken here while this residence requirement is being fulfilled. Not to exceed 16 semester hours of a student's last year's residence work may be taken for graduate credit, provided that all undergraduate requirements will have been satisfied by the graduation. In special cases candidates would be considered who have done three full years of work here and have done their last year of work in an institution approved by the faculty.

Candidates desiring to be graduated must make application to the registrar at least 30 days before the date that graduation is expected. The responsibility rests with a candidate to see that he has complied with all of the requirements.

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, chemical engineering, mechanical engineering, electrical engineering, civil engineering, flour-mill engineering, architecture, architectural engineering, landscape architecture, home economics, industrial journalism, 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 two-year curriculum in public-school music.
3. The housekeepers' course, lasting about fifteen weeks.
4. The short course in agriculture.
5. The eight-week creamery short course.
6. 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 Council 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.

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

## REGISTRATION

Students applying for graduate work should present themselves to the chairman of the Graduate Council at Nichols Gymnasium during the regular registration days (see College calendar), and at other times at his office, room 58, Fairchild Hall.

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 twelve credits, including thesis, in one semester.

GRADES. Graduate student's 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 and special reports upon it must be prepared in accordance with specifications to be obtained from the office of the chairman of the Graduate Council. (See College calendar for dates.)

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 the 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 announcement 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.

## VACATION CREDIT

Upon the recommendation of his major instructor a student not registered in the College may accumulate a limited number of graduate credits in problem or research courses during either semester, the summer school, or the period between the close of summer school and the beginning of the next succeeding semester under the following provisions: (1) The approval of the Graduate Council must be secured in advance. (2) The work must be carried on under the immediate supervision of a graduate instructor.

The credits so earned will be included on the student's next regular assignment marked "vacation credit" and will be in addition to the regularly allowed number of credits assigned. Such credits will be forwarded to the registrar by the instructor as soon as the latter receives the class cards after the beginning of the next semester.

## 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 during the regular collegiate year. The remainder of his time is given to graduate work. No half-time graduate assistant may receive more than twelve graduate credits per semester nor satisfy the residence requirement in less than two semesters and one summer school.

Half-time graduate assistantships, paying a salary fixed each year by the Board of Administration, have been established as follows:

| *Subject.* | *Number.* |
|---|---|
| Agricultural Economics | 1 |
| Agronomy | 2 |
| Animal Husbandry | 2 |
| Dairy Husbandry | 1 |
| Horticulture | 1 |
| Poultry Husbandry | 1 |
| Bacteriology | 1 |
| Botany and Plant Pathology | 1 |
| Education | 1 |
| Public Speaking | 1 |
| Zoölogy | 3 |
| Food Economics and Nutrition | 1 |
| Household Economics | 1 |

Any department having a half-time graduate assistantship vacant may appoint two quarter-time assistants whenever the plan seems feasible. A quarter-time assistantship pays half the salary of a half-time assistantship. A student holding a quarter-time assistantship may carry not more than fourteen credit hours each semester. By satisfactorily completing four to eight credits of graduate work in the summer session, graduate assistants may meet the requirements for a master's degree within one calendar year.

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 degree of Mechanical Engineer, Civil Engineer, Chemical Engineer, Electrical Engineer, Agricultural Engineer, Flour Mill Engineer, Architect, Architectural Engineer or Landscape 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.

A candidate must declare his candidacy and file with the Dean of the Division of Engineering a detailed statement of his professional study and experience, and an outline of his proposed thesis, not later than the November 15 next preceding the June commencement at which the degree is to be conferred.

A preliminary copy of the completed thesis must be submitted for criticism not later than April 1, and the final copy in duplicate must be submitted not later than May 15.

Candidates for professional degrees shall present themselves at the commencement exercises in order that the degrees may be conferred.

A diploma fee of $10 shall be paid by each candidate to the registrar not later than May 15.

# 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 high-minded 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 occurence.

## 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. This fee is not charged Summer School students, short course students, or students in trade courses, but is payable by special students in the College.

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

* The amount of the incidental fee may be changed before September, 1925.

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

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

The sick-benefit fee entitles the student to receive the service of the College physician for any illness contracted while in College. It also includes the cost of medicine, and free hospital service up to three days. The fee does not include the cost of surgical operations, reduction of fractures, or the treatment of chronic conditions.

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 a day, after three days of free service. 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.

RECAPITULATION. To make plain especially to prospective students the amount of fees due at the opening of the College year in accordance with the statements of the above paragraphs, the following tabular statement is given.

FOR RESIDENTS OF KANSAS.

| | *Old students.* | *New students.* |
|---|---|---|
| Matriculation | None | $10.00 |
| Incidental (both semesters) | $20.00 | 20.00 |
| Sick benefit (both semesters) | 6.00 | 6.00 |
| Total | $26.00 | $36.00 |

FOR NONRESIDENTS OF KANSAS.

| | *Old students.* | *New students.* |
|---|---|---|
| Matriculation | None | $15.00 |
| Incidental (both semesters) | $30.00 | 30.00 |
| Sick benefit (both semesters) | 6.00 | 6.00 |
| Total | $36.00 | $51.00 |

FOR ALL SHORT COURSE STUDENTS.

| | *1-8 weeks courses.* | *9-18 weeks courses.* |
|---|---|---|
| Incidental | $5.00 | $10.00 |
| Sick benefit | 1.50 | 3.00 |
| Total | $6.50 | $13.00 |

LATE ASSIGNMENT FEE. For unexcused late assignment the student is charged $5.

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 $10 a semester. These charges are noted under the descriptions of the several courses. 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. The matriculation fee, the incidental fee, and the sick-benefit fee for the full year are payable at the beginning of the year. Laboratory fees and the student activity fee are payable at the beginning of each semester.

A senior expecting to complete his course at the end of the first semester, by presentation of a statement to that effect signed by his dean, will be required to pay for the first semester only.

FEE RECEIPTS ARE TO BE SAVED. Receipts for fees paid must be shown to the assigner at the beginning of each semester before a student is permitted to take out his assignment. Fall semester fee receipts admit the student for second-semester assignment.

REFUND OF FEES. *No refund is made on the matriculation fee.* Certain refunds are made on other fees, as shown below.

A student who does not return for second semester work may receive a refund of his second semester fees.

A student permitted to withdraw on or before the end of the first one-fourth of a semester may receive a refund of one-half of the fees paid for that semester.

A student permitted to withdraw after remaining one-fourth and less than one-half semester may receive a refund of one-fourth the fees paid for that semester.

Refund is made on the unused portion of laboratory fees.

Refunds are given *only* on the presentation of the fee receipt for various fees paid. Refunds are authorized at the office of the registrar. *Fee receipts must be preserved* by the student.

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 cost of textbooks varies considerably from semester to semester and according to the curriculum pursued. The following tabulation shows the approximate cost of books required during the freshman year.

| *Curriculum.* | *First semester.* | *Second semester.* |
|---|---|---|
| Agriculture | $23.70 | $5.95 |
| Agricultural Engineering | 21.15 | 8.10 |
| Architecture | 14.45 | 4.75 |
| Civil Engineering | 22.15 | 4.75 |
| Electrical Engineering | 20.50 | 10.95 |
| Flour Mill Engineering | 11.50 | 11.25 |
| General Science | 16.60 | 4.45 |
| Home Economics | 21.25 | 8.65 |
| Industrial Journalism | 10.40 | .10 |
| Mechanical Engineering | 16.00 | 8.75 |
| Rural Commerce | 10.25 | 4.50 |
| Veterinary Medicine | 27.90 | 3.00 |

DRAWING INSTRUMENTS. In several curricula, especially in architecture and engineering, drawing instruments are required. These range in price from $7.50 to $25.00 a set.

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 obtained 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.

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. Taxi 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 employment 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 $2,650, 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.

Acknowledgment is made from year to year at this place of additions to the Life Membership Fund. Since the last report Edgar A. Allen has taken out a life membership of $100, R. R. McFadden contributed $3.50 to the fund when making repayment of a loan, and College Grange contributed $21.90.

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*, for the first five years. The royalties so far have amounted to approximately $2,000, 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, now over $3,000, is in constant use. 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 regard-

ing 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

The local branch of the American Association of University Women offer a scholarship, a gift, of $150 annually. This is awarded the woman student who has the highest academic rank at the end of the first semester of her junior year.

DEBATE. In the Department of Public Speaking 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.

Prospective students desiring information or catalogues should address the vice president's office.

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. A humorous magazine, *The Brown Bull,* is published by the students and appears about four times during the college year. *The Kansas State Engineer* is published by students in the Division of Engineering. Students in the Division of Agri-

culture issue *The Kansas Agricultural Student. The Home Economics News* is published quarterly by the faculty and students of the Division of Home Economics. A College annual, *Royal Purple,* is published each year by the senior class.

## COLLEGE POST OFFICE

The College operates an office for the reception and delivery of mail. This is not a part of the United States postal service, but students and College officers may have their mail delivered there. Mail is received from the Manhattan post office and taken to it three times a day. Matter may be deposited for registered mail, and postage stamps may be procured, but post office orders can not be obtained.

The chief purpose of this office is to facilitate inter-communication of College departments and communication of deans and teachers with students. All students are expected to call for their mail at least once each two days and preferably every day.

## 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 five dollars 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 circumstance to anyone who failed or was conditioned or deficient in any subject the preceding semester, or whose average grade was below G.

A student is not allowed to carry work by correspondence while in College except by permission of his dean.

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

Subjects are not dropped from assignments within two weeks of dates set for reports of low grades.

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. Changes are not made within the two weeks immediately preceding a

date for report of low grades. 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.

The student's attendance record is considered by each instructor as an important factor in determining the grade given in a subject.

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.

No regular examination may be given at a date in advance of that provided, except that, at the discretion of the head of the department, a student may be permitted to take his examination with another class in the same subject instead of in his own class, and that in cases of extreme importance the dean of the student may authorize an examination at an earlier date.

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 of C is entitled to take such special examination, provided the instructor of 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, except that in individual instances, where the reason is sufficient, the student's dean may authorize such examination at a date different than that provided by the rule.

Permission for examination in subjects not taken in class or to make up failures by special examination 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, except that in individual instances, where the reason is sufficient, the student's dean may authorize such examination at a date different from that provided by the rule.

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.

The distribution of grades indicated above applies to large numbers, at least a hundred or several hundred, and is not necessarily true of small numbers. It is not a foregone conclusion, for example, that one in a class of twenty must fail nor even that one in the class must have an E grade. In a small group the chances are very much greater that there may be a departure from the normal. If there be such a departure it should of course be recognized in the grades issued. In the long run the accumulated grades for a series of small classes should, however, approach the normal distribution.

## 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 case 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.

## THE POINT SYSTEM

For each semester credit of work assigned, the student receives points, according to the grade attained, on the following scheme: Grade E, 3 points; G, 2 points; M, 1 point; and P (or lower), no points. For graduation the total requirement in points is the same as in credits. Furthermore, the total number of points made in the freshman and sophomore years must be at least equal to the credit hours, and the total number of points made in the junior and senior years must be not less than the number of credit hours. Above the freshman year classification is based on the same requirement in points as in credits.

Seniors meeting the graduation requirement in credits but failing to meet it in points are required to take further courses designated by the dean of the division in which their major work lies, until the requirement in points is met.

## 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 for admission to the College 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:

| | |
|---|---|
| Freshman 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."

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 Vocational School. 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 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 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 student's employment bureau, which is maintained for the benefit of all students seeking employment. The regular religious meetings of the association occur on Thursday evenings from 7 to 7:45, 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 given 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.

## 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.

The Lincoln Literary Society, composed of young men in the Vocational School, has the same general aims and purposes as those in the College.

## AGRICULTURAL SOCIETIES

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 Agricultural Economics Club meets on the second and fourth Tuesdays of each month. Membership is open to undergraduate students majoring in

agricultural economics, graduate students majoring or minoring in agricultural economics, and to members of the Faculty whose work is of an agricultural economic character. The object of the club is to promote interest in agricultural economic topics, to encourage sound economic thinking, and to further the acquaintanceship of Faculty and students. Outside speakers are frequently secured for special meetings which are open to the public.

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 the members of the Faculty and outside speakers are secured for addresses on special topics.

The Dairy Club meets on the first and third Mondays of each month. Membership is open to anyone who is taking any four-year course in the Division of Agriculture and also to anyone actively engaged in dairy work at the College. The object of the organization is the furtherance of dairying in Kansas. Current topics and records of the dairy breeds are read and lectures on special subjects are given by Faculty and outside speakers.

The Horticultural Club meets the first and third Tuesdays of each month during the College year. Its object is to promote the horticultural interests of the state and to afford opportunity for students to improve their knowledge of horticulture. Students of the College interested in horticulture and Faculty members are eligible for membership. Students present the majority of the programs.

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 Kansas State Agricultural College Civil Engineering Society conducts the meetings of the civil-engineering students, the Architects' Club conducts the meetings of the students in architecture, and the student branch of the American Society of Agricultural Engineers has charge of the meetings of the students in agricultural engineering.

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 "sophomore honors" are awarded at Commencement to not more than five per cent of the sophomore class having the highest standing up to the close of the sophomore year.

In a similar manner "senior honors" are awarded to not exceeding ten per cent of the senior class having the highest standing during their junior and senior years.

In awarding honors, the following values are assigned: Grade E, 3; G, 2; M, 1; P, 0; C, minus 1; and F, minus 2. The honor grade is found by dividing

the sum of the products of the grade values and the credit hours by the number of the credit hours of work taken. In order to receive honors, the student's average must be G or higher.

The diplomas of the highest three per cent of the senior class are inscribed "with high honor" and of the remainder of the highest ten per cent "with honor."

## 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. |
| K Fraternity | Athletics. |
| Mu Phi Epsilon | Music. |
| Omicron Nu | Home Economics. |
| Phi Alpha Mu | Women's Science. |
| Phi Kappa Delta | Education. |
| 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 mu-

sical 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, basketball; 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. Basketball 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 buildings, and the equipment of the farm and the farm home with modern conveniences; the best methods of marketing the product 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 Kansas State 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 1,399 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 550 acres. The herds and flocks contain high-class representatives of the important breeds of dairy and beef cattle, hogs, horses, and sheep. 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.

* On July 1, 1925, Dean Farrell becomes president of the College and Leland Everett Call becomes dean in his stead.

## CURRICULA IN AGRICULTURE

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

A four-year curriculum in agriculture.

A four-year curriculum in agriculture with special training for landscape gardening.

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

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

## DEGREES

The four-year curricula in agriculture lead 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 IN AGRICULTURE

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 | | 6 |
| Total semester credits for graduation | | 137 |

As shown in the above general outline and in the tabulated curriculum given hereafter, the candidate for graduation must have completed one hundred

thirty-seven 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-four 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 apply toward meeting the requirements for the state certificate 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 | |
| Supervised Observation and Teaching in Agriculture | 3 | |
| Vocational Education | 3 | |
| Gas Engines and Tractors | | 3 |
| Farm Buildings | | 3 |
| Farm Equipment | | 2 |
| Farm Carpentry I | | 3 |
| Farm Carpentry II | | 2 |
| Farm Blacksmithing I | | 1 |
| Farm Blacksmithing II | | 1 |
| Farm Shop Methods | | 3 |
| Total | | 36 |

In some cases as many as twenty-four credit hours (the junior electives and the senior general electives) of the work specifically listed above as required for the preparation of Smith-Hughes teachers may be included in the electives provided in the curriculum in agriculture. In such cases the other twelve semester credit hours necessary to qualify the graduate to secure the Smith-Hughes teacher's certificate must be carried as extra work or taken in summer school or by correspondence study. In such cases the student can usually arrange to meet the requirements for both the degree and the teacher's certificate in one summer term of extra residence work. In the case of students majoring in any one of the three live stock departments, however, it may be necessary to take two extra summer schools of work in order to qualify for the bachelor's degree and the Smith-Hughes teacher's certificate.

### 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.

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## Curriculum in Agriculture

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 | | 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) |
| General Botany I | | General Botany II | |
| Bot. 101 | 3(1-4, 2) | Bot. 105 | 3(1-4, 2) |
| Judging Market Live Stock | | General Geology | |
| An. Husb. 132 | 2(0-6) | Geol. 103 | 3(3-0) |
| Elements of Dairying | | Dairy Judging | |
| Dairy Husb. 101 | 3(2-3) | Dairy Husb. 104 | 1(0-3) *or* |
| Library Methods | | Library Methods | |
| Lib. Ec. 101 | 1(1-0) *or* | Lib. Ec. 101 | 1(1-0) |
| Dairy Judging | | Judging Breeding Live Stock | |
| Dairy Husb. 104 | 1(0-3) | An. Husb. 138 | 2(0-6) |
| Agricultural Lectures | | Agricultural Lectures | |
| Gen. Agric. 101 | R(1-0) | Gen. Agric. 101 | R(1-0) |
| Infantry I | | Infantry II | |
| Mil. Tr. 101 | 1½(0-4) | Mil. Tr. 102 | 1½(0-4) |
| 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 | |
|---|---|---|---|
| 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. 130 | 3(3-0) | Farm Crops Agron. 109 | 5(3-6) |
| Soils Agron. 133 | 5(4-3) | | |
| Farm Poultry Production Poult. Husb. 101 | 2(1-2, 1) | | |
| Infantry III Mil. Tr. 103 | 1½(0-4) | Infantry IV Mil. Tr. 104 | 1½(0-4) |
| Physical Education M-III Phys. Ed. 105 | R(0-2) | Physical Education M-IV Phys. Ed. 106 | R(0-2) |
| Agricultural Seminar Gen. Agric. 103 | R | Agricultural Seminar Gen. Agric. 103 | R |

## JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Genetics An. Husb. 221 | 3(3-0) | General Entomology Ent. 101 | 3(2-3) |
| Plant Pathology I Bot. 205 | 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 |
| Agricultural Seminar Gen. Agric. 103 | R | Agricultural Seminar Gen. Agric. 103 | R |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Agricultural English Engl. 137 | 3(3-0) | Agricultural Relationships Gen. Agric. 105 | R(1-0) |
| Electives[4] Major | 6 | Electives[4] Major | 6 |
| Minor | 4 | Minor | 5 |
| General | 3 | General | 5 |
| Agricultural Seminar Gen. Agric. 103 | P | Agricultural Seminar Gen. Agric. 103 | R |

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. 130) 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.

4. 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.

# Agricultural Electives for Students in the Curriculum in Agriculture

## AGRICULTURAL ECONOMICS

FIRST SEMESTER

Marketing of Farm Products
3(3-0)

Advanced Agricultural Economics
3(3-0)

Grain Marketing
3(3-0)

Transportation of Farm Products
3(3-0)

Taxation and Land Ownership
3(3-0)

Farmer Movements
3(3-0)

SECOND SEMESTER

Advanced Farm Organization
3(2-3)

Agricultural Industries
2(2-0)

Agricultural Land Problems
3(3-0)

Conservation of Agricultural Resources
2(2-0)

Agricultural Finance
2(2-0)

History of Agricultural Economic Thought
3(3-0)

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

Seed Identification and Weed Control
2(1-3)

Advanced Forage Crops
2(1-3)

Advanced Soil Fertility
3(2-3)

Dry-land Farming
2(2-0)

Principles of Agronomic Experimentation
3(2-3)

Pasture Management
2(1-3)

Plant Genetics
3(3-0)

Advanced Grain Judging
2(0-6)

SECOND SEMESTER

Crop Improvement
3(2-3)

Crop Ecology
2(2-0)

Special Crops
2(2-0)

Grain Grading and Judging
2(0-6)

Soil Survey
2(1-3)

Agronomy Seminar
1(1-0)

Soil and Crop Management.
3(2-3)

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)

## 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)

Purebred Live-stock Production
2(2-0)

The American Live-stock and Meat Industry
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

Dairy Inspection I
2(1-3)

Dairy Breeds and Pedigrees
2(1-3)

Butter Making I
3(2-3)

Butter Making II
4(2-6)

SECOND SEMESTER

Milk Production
3(3-0)

Ice-cream Making
3(2-3)

Cheese Making
3(2-3)

Advanced Dairy Judging
1(0-3)

Feeding and Management of Dairy Cattle
3(2-3)

Dairy Seminar
1(1-0)

Market Milk
2(1-3)

Creamery Management
2(2-0)

Dairy Technology
1(1-0)

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 3(2-3) | Market Gardening 3(2-3) |
| Advanced Pomology 3(2-3) | Subtropical Pomology 2(2-0) |
| | Elements of Vegetable Gardening 3(2-3) |
| | 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(3-0) | Landscape Gardening III 2(1-3) (for graduates) |

Each Semester

Landscape Gardening I 2(2-0)

Civic Art 3(3-0)

Horticulture Seminar 1(1-0)

Orchard Problems

Market Gardening Problems

Horticultural Research

Forcing Flowers and Vegetables

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

## MILLING INDUSTRY

| First Semester | Second Semester |
|---|---|
| Wheat and Flour Testing 4(1-9) | Milling Qualities of Wheat and Other Cereals 2(2-0) |
| | 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)

Advanced Wheat and Flour Testing (Credit as arranged)

Both Semesters and Summer School

Milling Industry Research (Credit as arranged)

## POULTRY HUSBANDRY

FIRST SEMESTER

Poultry Judging
3(1-6)

Market Poultry and Eggs
4(2-6)

SECOND SEMESTER

Practice in Poultry Feeding
(One semester credit)

Artificial Incubation and Brooding
(Three semester credits)

Poultry Breeding
2(2-0)

Poultry Management
2(2-0)

Poultry Farm Organization
3(2-3)

Poultry Bacteriology
3(1-6)

Genetics of Drosophila
2(1-3)

BOTH SEMESTERS AND SUMMER SCHOOL

Poultry Research
(2 or more semester credits, for graduates)

Poultry Problems
(2 or more semester credits)

## AGRICULTURAL ENGINEERING

FIRST SEMESTER

Elements of Irrigation and Drainage
3(2-3)

Gas Engines and Tractors
3(2-3)

Tractors and Trucks
3(2-3)

SECOND SEMESTER

Farm Equipment
2(1-3)

Farm Sanitation and Water Supply
2(2-0)

Farm Motors
3(2-3)

EACH SEMESTER

Farm Buildings
3(1-6)

Field Machinery
2(1-3)

## SHOP PRACTICE

FIRST SEMESTER

Farm Carpentry I
3(1-6)

Farm Blacksmithing I
1(0-3)

Farm Shop Methods
3(1-6)

SECOND SEMESTER

Farm Carpentry II
2(0-6)

Farm Blacksmithing II
1(0-3)

## Curriculum Leading to the Degree of Bachelor of Science in Agriculture, with Special Training for Landscape Gardening

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 and the second the number of hours of laboratory work each week.

### FRESHMAN

| First Semester | | Second Semester | |
|---|---|---|---|
| College Rhetoric I<br>Engl. 101 | 3(3-0) | College Rhetoric II<br>Engl. 104 | 3(3-0) |
| Chemistry I<br>Chem. 101 | 5(3-6) | Chemistry II<br>Chem. 102 | 5(3-6) |
| General Botany I<br>Bot. 101 | 3(1-6) | General Botany II<br>Bot. 105 | 3(1-6) |
| Judging Market Live Stock<br>An. Husb. 132 | 2(0-6) | General Geology<br>Geol. 103 | 3(3-0) |
| Elements of Dairying<br>Dairy Husb. 101 | 3(2-3) | Dairy Judging<br>Dairy Husb. 104 | 1(0-3) |
| Library Methods<br>Lib. Ec. 101 | 1(1-0) | Judging Breeding Live Stock<br>An. Husb. 138 | 2(0-6) |
| Agricultural Lectures<br>Gen. Agric. 101 | R(1-0) | Agricultural Lectures<br>Gen. Agric. 101 | R(1-0) |
| Infantry I (Men)<br>Mil. Tr. 101 | 1½(0-4) | Infantry II (Men)<br>Mil. Tr. 102 | 1½(0-4) |
| Physical Education M-I (Men)<br>Phys. Ed. 103 | R(0-2) | Physical Education M-II (Men)<br>Phys. Ed. 104 | R(0-2) |
| Physical Education W-I (Women)<br>Phys. Ed. 151A | 1(0-3) | Physical Education W-II (Women)<br>Phys. Ed. 152A | 1(0-3) |

### SOPHOMORE

| First Semester | | Second Semester | |
|---|---|---|---|
| Object Drawing I<br>Arch. 111 | 2(0-6) | Plane Trigonometry<br>Math. 101 | 3(3-0) |
| Agricultural Economics<br>Ag. Ec. 101 | 3(3-0) | Landscape Gardening I<br>Hort. 126 | 2(2-0) |
| Plant Physiology I<br>Bot. 130 | 3(3-0) | Object Drawing II<br>Arch. 114 | 2(0-6) |
| Soils<br>Agron. 133 | 5(4-3) | General Zoölogy<br>Zoöl. 105 | 5(3-6) |
| Farm Poultry Production<br>Poult. Husb. 101 | 2(1-3) | Elements of Horticulture<br>Hort. 108 | 4(3-3) |
| Extempore Speech I<br>Pub. Spkg. 106 | 2(2-0) | | |
| Infantry III (Men)<br>Mil. Tr. 103 | 1½(0-4) | Infantry IV (Men)<br>Mil. Tr. 104 | 1½(0-4) |
| Physical Education M-III (Men)<br>Phys. Ed. 105 | R(0-2) *or* | Physical Education M-IV (Men)<br>Phys. Ed. 106 | R(0-2) *or* |
| Physical Education W-III (Women)<br>Phys. Ed. 153 | 1(0-3) | Physical Education W-IV (Women)<br>Phys. Ed. 154 | 1(0-3) |
| Agricultural Seminar<br>Gen. Agric. 103 | R | Agricultural Seminar<br>Gen. Agric. 103 | R |

## JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Genetics An. Husb. 221 | 3(3-0) | General Entomology Ent. 101 | 3(2-3) |
| Plant Pathology I Bot. 205 | 3(1-6) | Agricultural Mircrobiology Bact. 106 | 3(1-6) |
| | | Agricultural Journalism Ind. Jour. 164 | 1(1-0) |
| Surveying I Civ. Engr. 102 | 2(0-6) | Surveying II Civ. Engr. 111 | 2(0-6) |
| History and Literature of Landscape Gardening Hort. 222 | 2(2-0) | Plant Materials in Landscape Gardening Hort. 225 | 3(2-3) |
| Taxonomic Botany of the Flowering Plants Bot. 225 | 3(1-6) | Plant Ecology Bot. 228 | 2(2-0) |
| Farm Forestry Hort. 113 | 4(3-3) | Landscape Gardening II Hort. 238 | 3(0-9) |
| Agricultural Seminar Gen. Agric. 103 | R | Agricultural Seminar Gen. Agric. 103 | R |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Agricultural English Engl. 137 | 3(3-0) | Agricultural Relationships Gen. Agric. 105 | R(1-0) |
| Dendrology Hort. 116 | 3(1-6) | Silviculture Hort. 119 | 3(2-3) |
| Greenhouse Construction and Management Hort. 128 | 3(3-0) | Tree Surgery Hort. 233 | 2(1-3) |
| Theory and Aesthetics of Landscape Gardening Hort. 242 | 3(3-0) | Landscape Gardening III Hort. 245 | 2(1-3) |
| Pencil Rendering and Sketching Arch. 116 | 2(0-6) | Forcing Flowers and Vegetables Hort. 221 | 2( - ) |
| Spraying Hort. 207 | 3(2-3) | Still Life Drawing Arch. 117 | 2(0-6) |
| | | Civic Art Hort. 223 | 3(3-0) |
| | | Horticultural Research Hort. 316 | 2( - ) |
| Agricultural Seminar Gen. Agric. 103 | R | Agricultural Seminar Gen. Agric. 103 | R |

# Curriculum in Animal Husbandry and Veterinary Medicine

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 | | Pathogenic Bacteriology I | |
| Zoöl. 105 | 5(3-6) | Bact. 111 | 4(2-6) |
| Anatomy I | | Anatomy II | |
| Anat. and Physiol. 102 | 4(2-6) | Anat. and Physiol. 107 | 9(4-15) |
| Soils | | Farm Crops | |
| Agron. 133 | 5(4-3) | Agron. 109 | 5(3-6) |
| Organic Chemistry (Agr.) | | | |
| Chem. 120 | 3(2-3) | | |
| Infantry III | | Infantry IV | |
| Mil. Tr. 103 | 1½(0-4) | Mil. Tr. 104 | 1½(0-4) |
| Physical Education M-III | | Physical Education M-IV | |
| Phys. Ed. 105 | R(0-2) | Phys. Ed. 106 | R(0-2) |
| Agricultural Seminar | | Agricultural Seminar | |
| Gen. Agric. 103 | R | Gen. Agric. 103 | R |

## JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Embryology | | Principles of Feeding | |
| Zoöl. 219 | 3(2-3) | An. Husb. 152 | 3(3-0) |
| Anatomy III | | Anatomy IV | |
| Anat. and Physiol. 111 | 5(1-12) | Anat. and Physiol. 116 | 3(1-6) |
| Histology I | | Histology II | |
| Path. 101 | 3(1-6) | Path. 106 | 3(1-6) |
| Genetics | | Agricultural Journalism | |
| An. Husb. 221 | 3(3-0) | Ind. Jour. 164 | 1(1-0) |
| | | Elements of Horticulture | |
| | | Hort. 108 | 4(3-3) |
| Electives[2] | 3( - ) | Electives[2] | 2( - ) |
| Agricultural Seminar | | Agricultural Seminar | |
| Gen. Agric. 103 | R | Gen. Agric. 103 | R |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| General Entomology | | Agricultural Relationships | |
| Ent. 101 | 3(2-3) | Gen. Agric. 105 | R(1-0) |
| Agricultural Economics | | Farm Organization | |
| Ag. Ec. 101 | 3(3-0) | Ag. Ec. 106 | 3(2-3) |
| Comparative Physiology I | | Comparative Physiology II | |
| Anat. and Physiol. 121 | 5(4-3) | Anat. and Physiol. 126 | 3(2-3) |
| Agricultural English | | Pathology I | |
| Engl. 137 | 3(3-0) | Path. 202 | 3(2-3) |
| Electives[2] | 2( - ) | Electives[2] | 7( - ) |
| Agricultural Seminar | | Agricultural Seminar | |
| Gen. Agric. 103 | R | Gen. Agric. 103 | R |

## FIFTH YEAR

Junior year of the Curriculum in Veterinary Medicine

## SIXTH YEAR

Senior year of the Curriculum in Veterinary Medicine

# Agricultural Economics

Professor GRIMES
Professor ENGLUND
Professor GREEN
Assistant Professor EVANS
Instructor HODGES
Instructor HEDGES

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 equipment belonging to the department is valued at $4,683.†

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.

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, Assistant Professor Evans, and Mr. Hodges.

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. Laboratory charge, $1.

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, Assistant Professor Evans, and Mr. Hodges.

Various systems of farm records and accounts are studied to acquaint the student with the more practical methods. The laboratory work affords oppor-

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

† The figures for equipment given here and on pages following are based on the official reports of June 30, 1924.

tunity 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. Laboratory charge, $1.

FOR GRADUATES AND UNDERGRADUATES

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

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. Texts: Clark's *Principles of Marketing* and Hibbard's *Marketing Agricultural Products.*

203. GRAIN MARKETING. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Ag. Ec. 202. Professor Green and Mr. Hedges.

This course deals with organized grain exchanges and their economic functions; fundamental factors of supply and demand affecting grain prices; influence of speculation on price; domestic and export trade in grain; and a study of competitive sources of grain supply.

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

This course makes a study of the shipping problems of the farm producer, with particular reference to grain and live stock. Attention is given to freight-rate structures and particular tariffs as they affect the marketing of farm products. Theory and practice in rate making; the effect on rates, of water competition, market competition, competing-line competition, and the development of motor-truck competition are covered with a view to giving the student a better understanding of how the farmer is concerned with transportation services and costs.

206A. ADVANCED FARM ORGANIZATION. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Ag. Ec. 106. Professor Grimes and Assistant Professor 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 1925-'26; alternates with Ag. Ec. 212.) Class work, two hours. Two semester credits. Prerequisite: Ag. Ec. 101.

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 1924-'25; alternates with Ag. Ec. 211.) Class work, two hours. Two semester credits. Prerequisite: Ag. Ec. 101. Open to juniors, seniors, and graduates only.

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 land classification, land utilization, and land policies. Special emphasis is placed on property in land; means of acquiring farm land; farm tenancy; public aid in land settlement; and land taxation. It also includes a brief study of the Torren's system of registration in land transfer. It consists of lectures, assigned readings, topics for reports, and discussion. Text: Ely and Morehouse's *Elements of Land Economics.*

219. TAXATION AND LAND OWNERSHIP. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Ag. Ec. 101, or consult instructor. Professor Englund.

This course consists of a study of some of the fundamental principles of taxation, particularly in their relation to land ownership. Special emphasis is placed on problems of taxation in Kansas. A historical and critical study is made of the general property tax, its advantages and inadequacies under modern economic conditions. This course also considers the possibilities of improving the fiscal system of Kansas and other states where similar economic conditions prevail. Instruction is given by lectures, assigned reading, reports and recitation.

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

The first half of this course deals with the extent to which the federal reserve act supplies farm credit and with the federal farm loan act and the intermediate credits act as instruments for obtaining farm credit. Some comparisons are also made with methods used in financing other industries. The second part of the course deals with farm use of credit based on the financial accounts of representative Kansas farms. Texts: Wright's *Bank Credit and Agriculture* and Wright's *Farm Mortgage Financing.*

227. FARMER MOVEMENTS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Ag. Ec. 101. Professor Grimes.

Farmer movements include those efforts of farmers to improve their situation by organized action. The present and past activities and attainments of such organizations as the Grange, the Farmers' Union, the Farm Bureau, the Farmers' Alliance, and the American Society of Equity, are considered and discussed.

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

This course involves individual research problems in the marketing of farm products, coöperation among farmers, farmer movements, 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 basic principles of economics 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.

310. HISTORY OF AGRICULTURAL ECONOMIC THOUGHT. Elective, second semester. Class work, three hours. Three semester credits. Prerequisites: Consult instructor. Professor Grimes.

The purpose of this course is to acquaint the student with the development of agricultural economics and the relation of agricultural economic doctrines to conditions existing when they were formulated. The work consists of assigned readings and discussions.

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# Agronomy

Professor CALL*
Professor THROCKMORTON
Professor SALMON
Professor PARKER
Associate Professor SEWELL
Associate Professor ZAHNLEY
Associate Professor LAUDE
Assistant Professor DAVIS
Assistant Professor LYONS
Assistant Professor LANDON
Assistant Professor ENLOW
Assistant HARLING
Assistant PHINNEY
Graduate Assistant RUPPERT
Graduate Assistant HOOVER

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.

This department owns equipment valued at $31,316.

## COURSES IN FARM CROPS

FOR UNDERGRADUATES

105. SEED IDENTIFICATION AND WEED CONTROL. Elective first semester and summer school. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Agron. 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. Laboratory charge, $2.50.

108. GRAIN GRADING AND JUDGING. Elective, second semester and summer school. Laboratory work, six hours. Two semester credits. Prerequisite: Agron. 109. Professor Salmon and Associate Professor Zahnley.

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* On July 1, 1925, Professor Call becomes dean of the Division of Agriculture and Professor Throckmorton becomes head of this department.

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. Laboratory deposit, $3.50.

109. FARM CROPS. Sophomore year, second semester. 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. Laboratory deposit, $5.

114. ADVANCED GRAIN JUDGING. Elective, first semester. Laboratory, six hours. Two semester credits. Prerequisite: Agron. 108. Professor Salmon and Associate Professor Zahnley.

This course is a continuation of Agron. 108. Identification, commercial grading, and judging and presenting the merits of samples of the various kinds of field crops orally and in writing are emphasized. Laboratory charge, $3.

FOR GRADUATES AND UNDERGRADUATES

202. CROP IMPROVEMENT. Elective, second semester. Class work, two hours; laboratory, three or six hours. Three or four semester credits. Prerequisites: Agron. 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. Laboratory charge, $2.

203. ADVANCED FORAGE CROPS. Elective, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Agron. 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. Laboratory deposit, $2.

205B. PRINCIPLES OF AGRONOMIC EXPERIMENTATION. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Agron. 109 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. Laboratory charge, $2.50.

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

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. 109. Associate Professor ———.

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. Laboratory deposit, $2.50.

208. PLANT GENETICS. Elective, first semester. (Not offered in 1925-'26.) 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 Nabours, Professor Parker, Associate Professor Warren, 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. Laboratory deposit, $5.

211. CROP ECOLOGY. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Agron. 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.

212. ORIGIN AND CLASSIFICATION OF CROP PLANTS. Elective, first semester. Class and laboratory work, six hours. Three semester credits. Prerequisite: Agron. 109. Professor Parker and Associate Professor Zahnley.

This course consists of lecture, reference and laboratory work on the geographical and botanical origin of crop plants. A careful study is made of the characters used in the identification of varieties of crop plants and related wild forms. Laboratory charge, $2.

213. SPECIAL CROPS. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Agron. 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.

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 ———.

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

## COURSES IN SOILS

FOR UNDERGRADUATES

133. SOILS. Sophomore year, first semester. Class work, four hours; laboratory, three hours. Five semester credits. Prerequisites: Chem. 102 or 108A and Geol. 103. Professor Throckmorton and Assistant Professor Lyons.

This course deals with the fundamental principles underlying the management of soils. Laboratory charge, $3.50.

FOR GRADUATES AND UNDERGRADUATES

231. DRY-LAND FARMING. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: Agron. 133. Professor Throckmorton.

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

232A. ADVANCED SOIL FERTILITY. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Agron. 133.

This course deals with the use of commercial fertilizers and their effects upon plants and soil. Laboratory deposit, $4.

233. SOIL SURVEY. Elective, second semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Agron. 133.

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.

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. 133. Professor Throckmorton and Assistant Professor 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. Laboratory deposit, $3.50.

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 Throckmorton and Associate Professor Sewell.

Students choose or are assigned special problems in soils. Laboratory deposit, $5.

243. SOIL AND CROP MANAGEMENT. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Agron. 109 and 133. Professor Call.

The practical management of soils and crops is covered by means of discussion and problems.

FOR GRADUATES

331. SOIL RESEARCH. Elective, both semesters and summer school. One to five semester credits, according to the work done. Prerequisites: Agron. 133 and Chem. 250. 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 BELL
Professor IBSEN
Associate Professor REED
Associate Professor ANDERSON
Assistant Professor AUBEL
Assistant Professor MACKINTOSH
Instructor MARSTON
Instructor WEBER
Graduate Assistant SAWIN
Graduate Assistant WILLMAN

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.

The department owns equipment worth $31,153. This includes live stock valued at $25,705.

## COURSES IN ANIMAL HUSBANDRY

FOR UNDERGRADUATES

132. JUDGING MARKET LIVE STOCK. Freshman year, first semester. Laboratory, six hours. Two semester credits. Associate Professor Reed, Associate Professor Anderson, Assistant Professor Aubel, Assistant Professor Mackintosh, and Mr. Weber.

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.

138. JUDGING BREEDING LIVE STOCK. Freshman year, second semester. Laboratory, six hours. Two semester credits. Prerequisite: An. Husb. 132. Associate Professor Reed, Associate Professor Anderson, Assistant Professor Aubel, Assistant Professor Mackintosh, and Mr. Weber.

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 Live Stock.*

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. Assistant Professor 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.* Laboratory charge, $2.

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 Anderson.

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. 132, 138, and 152. Professor McCampbell and Associate Professor Anderson.

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. 132, 138, and 152. Mr. Weber.

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. 132, 138, and 152. Associate Professor Reed.

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. 132, 138, and 152. Assistant Professor Mackintosh.

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 pratice in feeding, handling, and housing horses. Text: Gay's *Productive Horse Husbandry.*

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

This is a course in killing, and in dressing, cutting, and curing meats. Text: Hesler's *Farm Meats.* Laboratory charge, $2.50.

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. 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. Associate Professor Anderson.

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. 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 standard; 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. 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, Ibsen, and Parker, and Associate Professor Warren.

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. Assistant Professor 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. Instructor Marston.

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 Reed.

245. ANIMAL HUSBANDRY PROBLEMS. Elective, both semesters and summer school. Credit as arranged. Prerequisites: An. Husb. 140, 149, 152, and 223,

and such other courses as may be necessary to a satisfactory study of any particular problem selected for study. Professor McCampbell.

250. PURE-BRED LIVE-STOCK PRODUCTION. Elective, second semester. Class work two hours. Two semester credits. Open only to seniors and graduates, with prerequisites as follows: An. Husb. 149 and 223. Associate Professor Reed.

This course gives the student an opportunity to study the real function of pure-bred live stock, the many factors upon which the successful production of pure-bred live stock depends, and the possibilities in pure-bred live-stock production.

260. THE AMERICAN LIVE-STOCK AND MEAT INDUSTRY. Elective, second semester. Class work, three hours. Three semester credits. Prerequisites: An. Husb. 132, 138, and 152. Professor McCampbell.

This course includes primarily an advanced study of the live-stock and meat industry, its organization and operation, how it grew up with the country, and the relation of its diversified activities to each other and to the public. The development of the live-stock and meat industry is studied under two periods: (1) The prerefrigeration period, extending from the earliest settlements to approximately 1870. (2) The refrigeration period from 1870 to the present time. Considerable time will be devoted to grades and classes of live stock, grades and classes of carcasses, packing house by-products, methods of marketing, cycles in production, government regulations, and trends in the American live-stock and meat industry. Clemen's *The Live-stock and Meat Industry* will be used as a text. This will be supplemented with lectures and assigned readings and reports.

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. Assistant Professor Mackintosh.

This course includes grading of carcasses, studies in nutritive value 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. Associate Professor Reed.

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 LUSH
Instructor RIDDELL
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 9,202 pounds of milk and 423 pounds of butter fat; for the Ayrshires, 12,895 pounds of milk and 474 pounds of butter fat; for the Holsteins, 14,411 pounds of milk and 488 pounds of butter fat; and for Jerseys, 8,408 pounds of milk and 439 pounds of butter fat.

The Department of Dairy Husbandry is provided with ample room in the west wing of Waters Hall. The creamery is located in a one-story annex on the north end of this wing. In this building the department has the most up-to-date equipment available for handling butter, cheese, milk and ice cream on a quantity basis, and is equipped far better than ever before to instruct students interested in the manufacturing side of dairying.

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. In 1923 the Kansas team placed second.

This department owns equipment valued at $55,383. This figure includes live stock to the value of $29,810.

## COURSES IN DAIRY HUSBANDRY

FOR UNDERGRADUATES.

101. ELEMENTS OF DAIRYING. Freshman year, both semesters and summer school. Class work, two hours; laboratory, three hours. Three semester credits. Associate Professor Cave, Mr. Renner, and Mr. Riddell.

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 tests, 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. Laboratory deposit, $2.

104. DAIRY JUDGING. Freshman year, both semesters and summer school. Laboratory, three hours. One semester credit. Mr. Lush and Mr. Riddell.

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 breed-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*. Laboratory deposit, $2.

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. Text: Eckles' *Dairy Cattle and Milk Production.*

109. BUTTER MAKING I. Elective, 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: Hunzkier'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 Pasteurization 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. Laboratory charge, $2.

111. BUTTER MAKING II. Elective, first semester. Class work, two hours; laboratory, six hours. Four semester credits. Prerequisites: Dairy Husb. 101 and Bact. 211. Associate Professor Olson.

This course is for students specializing in dairy manufacturing, and differs from Butter Making I in having six hours laboratory instead of three. Laboratory charge, $2.

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. Text: Kelley and Clement's *Market Milk.*

*Laboratory.*—The work includes actual practice in all the steps in the pro-

duction of market milk and cream in the College milk plant. Laboratory charge, $2.

118. DAIRY INSPECTION II. (Vet.) Senior year, second semester. Laboratory, three hours. One semester credit. Mr. Renner.

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*. Laboratory deposit, $2.

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.

125. DAIRY TECHNOLOGY. Elective, second semester. Lectures, one hour. One semester credit. Prerequisite: Dairy Husb. 109 and 111. Associate Professor Olson.

This is a lecture course covering special products made from milk such as condensed milk, powdered milk, malted milk, casein, etc.

130. ICE-CREAM MAKING. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Dairy Husb. 106 and 116. Associate Professor Olson.

This course includes a thorough study of the science and practice of the commercial manufacture of ice cream and ices. Text: Fisk's *Book of Ice Cream*.

*Laboratory*.—The laboratory work in ice-cream making includes all phases of the manufacture of ice cream and ices in the modern college plant. Laboratory charge, $2.

135. CHEESE MAKING. Elective, second semester. Class work, two hours, laboratory, three hours. Three semester credits. Prerequisites: Dairy Husb. 106 and Bact. 211. Mr. Renner.

The class work comprises a study of the manufacture of American cheddar cheese, soft cheeses, and the most important foreign varieties. Text: Thom and Fisk's *Book of Cheese*.

*Laboratory*.—The work includes the actual manufacture of the various types of cheese in the laboratory. Laboratory charge, $2.

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.

207. FEEDING AND MANAGEMENT OF DAIRY CATTLE. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Dairy Husb. 108. Associate Professor Cave.

This is an advanced course in feeding as it applies to dairy cattle under ordinary conditions and to cows on advanced registry test. Consideration is given to general management problems and the fitting of animals for show and sale. 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. Mr. Lush.

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 ar-

ranged. 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, 111, 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.

226. CREAMERY MANAGEMENT. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Dairy Husb. 111. Associate Professor Olson.

This is an advanced course in creamery management for students specializing in dairy manufacturing.

FOR GRADUATES

301. DAIRY RESEARCH. Elective, both semesters. Credit as arranged. Prerequisites: Dairy Husb. 108, 109, 206, 211 or 108, 111, 116, and 226.

This course gives credit for special investigations in dairy husbandry or dairy manufactures which may form the basis of a thesis in partial fulfillment of the requirements for the degree of Master of Science.

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## General Agriculture

DEAN CALL

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.

103. AGRICULTURAL SEMINAR. Required of all undergraduates in the Division of Agriculture. Four meetings each semester.

The agricultural seminar is maintained primarily to bring all the agricultural undergraduates together with reasonable frequency for the discussion of general agricultural questions and agricultural student affairs. The programs will be presented by students, members of the College faculty, and invited speakers from outside the College community.

105. AGRICULTURAL RELATIONSHIPS. Senior year, second semester. Class work, one hour. Required of all seniors in agriculture. Dean Call.

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 HELDER
Assistant Professor BALCH
Graduate Assistant FILINGER

A wealth of illustrative material for classes in all horticultural subjects is found in the large collection of species growing on 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, 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 curriculum, with the coöperation of the Departments of Civil Engineering and Architecture, is offered the latter students. (See "Curriculum leading to the degree of Bachelor of Science in Agriculture, with special training in landscape gardening.") The value of equipment belonging to this department is $5,103.

## COURSES IN HORTICULTURE

FOR UNDERGRADUATES

105. SYSTEMATIC POMOLOGY. Elective, first semester. Class work, two hours; laboratory, six hours. Four semester credits. Prerequisite: Hort. 108. Professor Barnett and Assistant Professor Pickett.

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, judging, and the preparation of fruit displays are the principal laboratory topics. Laboratory charge, $1.

108. ELEMENTS OF HORTICULTURE. Sophomore year, second semester. 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.

Both the practices necessary for success in orcharding and gardening and the principles on which these practices are based are brought out in some detail. This course is presented with two aims: First, to give the student who becomes a general farmer, a teacher of high-school agriculture, or a county agent the fundamentals of horticulture; second, to serve as a basic course of students planning to major in some branch of horticulture. Text: Sears' *Productive Orcharding.*

*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. Laboratory charge, $1.

110. SMALL FRUITS. Elective, second semester and summer school. Class work, two hours. Two semester credits. Prerequisite: Bot. 105. 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. Assistant Professor Helder.

This is a course in landscape gardening appreciation, the purpose of which is to afford sufficient knowledge of the art to enable the student to become acquainted with the fundamental principles underlying its application to the planning, developing, and maintaining of those landscape phases directly and intimately associated with the building and improving of the home grounds. In conjunction with the lectures the student is introduced to the methods of preparing plans for home grounds and is also given some acquaintance with the requirements for the larger landscape developments such as playgrounds and parks. Special emphasis is placed upon an acquaintance with plant materials and also upon the architectural features as used in the landscape work which has special relation to the home.

126. LANDSCAPE GARDENING I. Elective, first and second semesters and summer school. Class work, two hours. Two semester credits. Assistant Professor Helder.

This is a general course designed to give the student a broad knowledge of the planning of land areas for efficient use and beauty. A study is made of the various types of landscape and garden forms, of the elements which compose each, and the principles which underlie their artificial creation. A brief introduction to the plant materials for landscape gardening, including

trees, shrubs, vines, and herbaceous flowers, which are hardy in Kansas, is given. The College campus affords an excellent laboratory for the study of landscape plant materials. A series of problems is given, advancing from the simple arrangement of home grounds to the layout of the country estate or park. This course is illustrated by the use of the stereopticon.

128. GREENHOUSE CONSTRUCTION AND MANAGEMENT. Elective, first semester. Class work, three hours. Three semester credits. Prerequisites: Agron. 133 and Bot. 105. Assistant Professor 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.

130. SCHOOL GARDENING. Summer school. Class work, two hours. Two semester credits. Assistant Professor Balch.

This is a course in general vegetable gardening designed for teachers in the public schools. The field covered includes in a general way soils, insects, diseases, and machinery, as well as vegetable crops and their culture.

133. ELEMENTS OF VEGETABLE GARDENING. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Agron. 133 and Bot. 105. Assistant Professor Balch.

This course deals with the practices necessary for success in vegetable gardening, aiming to give the student who becomes a teacher, a county agricultural agent, or a vegetable grower the fundamentals of this work, or to serve as a basic course for those interested in taking advanced courses in vegetable production. Laboratory charge, $2.50.

FOR GRADUATES AND UNDERGRADUATES

201. PRACTICAL POMOLOGY. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Hort. 105. 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. Laboratory charge, $1.

202. SUBTROPICAL POMOLOGY. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Hort. 105. 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. 105. 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, and preparation of production graphs studies are typical of the laboratory work in this course. Laboratory charge, $1.

207. SPRAYING. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Chem. 102. Assistant Professor Pickett.

The class work consists of lectures and assigned readings on spray machinery and accessories; the chemical properties, the manufacture and the uses of the important insecticides and fungicides for garden and orchard; and the determination of spray dates.

*Laboratory.*—The laboratory work offers practice in the preparation and testing of spray materials. Special study is given spray machinery and accessories. Laboratory charge, $1.

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. Prerequisites: Agron. 133 and Hort. 133. Assistant Professor 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. Laboratory charge, $2.50.

218. MARKET-GARDENING PROBLEMS. Credit determined by instructor. Prerequisite: Hort. 210. Assistant Professor 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. Prerequisite: Hort. 128 or Hort. 133. Assistant Professor 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. Assistant Professor Helder.

This course offers a comprehensive study of the historical development of the art of landscape gardening from its earliest known practice to the present day. Emphasis is placed upon the influence the art has had upon the different races of people through affecting their social life, and the sequential growth it has made through its transfer from one people to another throughout the successive stages of its development.

223. CIVIC ART. Elective, first and second semesters. Class work, three hours. Three semester credits. Prerequisites: Hort. 222, 225, 242, and 245. Assistant Professor Helder.

This course is designed to afford the student opportunity for advanced and

extensive study of technical problems concerning the planning and developing of municipal landscape work such as parks, playgrounds, park systems, subdivisions, and civic centers. These problems are studied with direct reference to the social, economic, and æsthetic welfare of the municipality. The course emphasizes the problems which concern the smaller cities and towns.

225. PLANT MATERIALS IN LANDSCAPE GARDENING. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Bot. 105. Assistant Professor Helder.

This course offers the student opportunity for a comprehensive study of the wide and varied range of plant material used in landscape gardening. Special emphasis is laid upon the relation between plant materials and soil and climatic conditions, as well as particular varieties appropriate to certain landscape styles. The nature, character, foliage, flower, and fruit of plant materials are discussed with regard to the influence these play in both the practical and æsthetic phases of landscape gardening. Frequent field trips are taken to give the student an opportunity to get an intimate acquaintance with plant materials appropriate to landscape work. Laboratory charge, $1.

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

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. Laboratory charge, $1.

235. HORTICULTURE SEMINAR. Elective, first and second semesters. Class work, one hour. One semester credit. Prerequisites: Hort. 105 and 133 or 128. Professor Dickens and Professor Barnett.

The work in this course includes a study and critical discussion of recent horticultural publications and of experimental 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. Prerequisites: Hort. 126 and 225. Assistant Professor Helder.

A series of advanced problems of a practical nature is offered the student, and from these a comprehensive knowledge of landscape gardening as applied to practical land improvement is afforded. The adjustment of certain landscape features, such as road building, walks, terraces, and walls, is considered, and special emphasis is laid upon materials of construction and the engineering phase of landscape gardening. Laboratory charge, $1.

242. THEORY AND ÆSTHETICS OF LANDSCAPE GARDENING. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Hort. 222. Assistant Professor Helder.

This course offers an analytical study of landscape design with special reference to stimulating the student's artistic comprehension. The course deals largely with the theoretical study of landscape motifs and the influence these exert upon the æsthetic sense. A study of landscape design pertaining to both landscape painting and landscape gardening is made, and the relation these bear to one another is brought out to show how the study of the works of great landscape painters aids in the comprehension of the principles underlying landscape design as applied to gardening. The course is planned for those intending to specialize in landscape gardening although it will prove interesting and instructive to anyone wishing to obtain information regarding the psychology of landscape design.

245. LANDSCAPE GARDENING III. Elective, second semester and summer school. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisites: Hort. 225 and 238. Assistant Professor Helder.

This course includes a study of complicated problems of landscape garden-

ing, dealing with the planning and laying out of large areas as estates, country clubs, golf courses, subdivisions, parks, and playgrounds. Special attention is given to the adaptation of large natural tracts to park development. It includes the preparation of complete plans and specifications covering comprehensive landscape developments and also the discussion of methods in letting contracts, and analyzing bids for landscape work. A thorough knowledge of the technic of planning new developments and also the replanning of existing landscape work is offered, and the student is trained in construction pertaining to roads, walks, walls, and other structural work used in large landscape projects. Laboratory charge, $1.

FOR GRADUATES

316. HORTICULTURAL RESEARCH. Elective, both semesters and summer school. Credit determined by the instructor. Prerequisites: Such courses as the problem undertaken may require. Professor Dickens, Professor Barnett, and Assistant Professor Helder.

Graduate students who enroll in this course may select for original investigation any feasible problem which relates to their major line of graduate study. The field covered includes pomology, olericulture, forestry, and landscape gardening. Data collected in this course may form the basis for a master's thesis.

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# Milling Industry

Professor SWANSON
Associate Professor WORKING
Miller OAKES

The milling of wheat and other cereals occupies second rank among manufacturing industries of the United States, on the basis of the cost of raw materials used in manufacture, and sixth on the basis of the value of products. Milling products constitute over one-third of the total food materials produced in the United States. An industry of such magnitude calls for technically trained men. Kansas is the center of the hard-winter wheat belt, and flour milling is the second manufacturing industry in the state.

The department has a well-equipped flour mill, consisting of six double-stands rolls with necessary wheat-cleaning machinery, sifters, purifiers, and dust collectors. The equipment is equal to that found in the commercial mills of the same capacity.

The baking laboratory is equipped with dough mixer, proofing closet, baking oven, and other necessary apparatus. The chemical laboratory contains the apparatus needed for flour and wheat testing. For advanced work there are available a hydrogen-ion potentiometer, and apparatus for making conductivity measurements and viscosity tests.

The department owns equipment valued at $17,182.

## 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. Laboratory charge, $2.

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. Laboratory charge, $2.

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

This course is a continuation of Milling Practice I. Laboratory charge, $2.

115. THESIS. Senior year, continuing through the year. First semester; laboratory, three hours; one semester credit. Second semester: laboratory, six hours; two semester credits. Professor Swanson, Associate Professor Working and Mr. Oakes.

The flour mill and laboratories furnish an excellent opportunity for experimental work on problems connected with flour milling or the testing of wheat and flour. The subject for investigation should be selected in consultation with the head of the department at the beginning of the senior year.

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. Prerequisites: Mil. Ind. 211 and Chem. 120 and 251 or 260. Professor Swanson and Associate Professor Working.

This course includes special quantitative tests applied to cereals and their by-products; methods of analysis and interpretation of results. Laboratory deposit, $7.50.

204. EXPERIMENTAL BAKING A. Senior year and elective, second semester. Laboratory, six hours. Two semester credits. Prerequisite: Mil. Ind. 203. Associate Professor Working.

This course includes practice in baking tests; comparison of methods, formulas, and flour; and interpretation of results. Laboratory charge, $4.

210. ADVANCED WHEAT AND FLOUR TESTING. First or second semester. One semester credit for each three hours laboratory work. Prerequisite: Mil. Ind. 203 and such other courses as are necessary for the work the student wishes to pursue. Professor Swanson and Associate Professor Working.

In this course the student has opportunity to study physico-chemical and other methods used in testing wheat and flour.

211. MILLING QUALITIES OF WHEAT AND OTHER CEREALS. Junior year and elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Chem. 120. Professor Swanson.

A brief study is made of the factors which affect the milling qualities of wheat and other cereals such as moisture, respiration, enzymes, harvesting and storage, climate and soil. Attention is also given to processes of manufacturing cereal food products.

This course supersedes Mil. Ind. 103, Grain Products.

FOR GRADUATES

301. MILLING INDUSTRY RESEARCH. Elective, both semesters and summer school. Credit as arranged. Prerequisites: Mil. Ind. 203 and 204 and other courses as required by the problem selected. Professor Swanson and Associate Professor Working.

In this course a definite line of investigation is followed which may, if sufficient as to quality and quantity, be used as a basis for a thesis presented in partial fulfillment of the requirements for the degree of master of science.

# Poultry Husbandry

Professor PAYNE
Associate Professor WARREN
Assistant Professor STEUP
Graduate Assistant MOORE
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.

The department owns equipment valued at $10,308.

## 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 Payne, Assistant Professor Steup, and Mr. Moore.

This course takes up the problems of poultry management on the general farm. Text: Lippincott's *Poultry Production.* Laboratory charge, $2.

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. Mr. Moore.

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.

109. POULTRY JUDGING. Elective, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Poult. Husb. 101. Assistant Professor Steup.

In this course a historical study is made of the various breeds commonly found on the Kansas farm. Particular attention is paid to production characteristics and tracing the evolution of the present breed types.

*Laboratory.*—About half the time in the laboratory is devoted to judging the standard breeds and varieties, both by score card and by comparison. The rest of the time is given over largely to judging hens for egg production on the basis of their trapnest records.

116. MARKET POULTRY AND EGGS. Elective, first semester. Class work, two hours; laboratory, six hours. Four semester credits. Prerequisite: Poult. Husb. 101. Professor Payne and Assistant Professor Steup.

In this course the lectures cover the methods of handling market eggs and live and dressed poultry.

*Laboratory.*—In the laboratory practice is given in candling and grading eggs; caponizing, killing, cooling, grading, and packing poultry for market. The student will also crate-feed, kill, and dress three lots of market poultry. Text: Benjamin's *Marketing Poultry Products.*

120. ARTIFICIAL INCUBATION AND BROODING. Elective, second semester. Lectures, by appointment; laboratory, three times a day, seven days a week for a period of not less than eight weeks at hours outside the regular schedule. Three semester credits. Prerequisite: Poult. Husb. 101. Professor Payne and Mr. Moore.

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. Laboratory charge, $2.

125. ADVANCED INCUBATION. Elective, second semester. Three times a day, seven days a week for a period not less than three weeks at hours outside of the regular schedule. One semester credit. Prerequisites: Poult. Husb. 101 and 120. Professor Payne and Mr. Moore.

A study of the baby chick industry, the operation of a mammoth incubator, and the packing and shipping of baby chicks will comprise the work in this course. Laboratory charge, $2.

FOR GRADUATES AND UNDERGRADUATES

202. POULTRY BREEDING. Elective, second semester. Lectures, two hours. Two semester credits. Prerequisite: An. Husb. 221. Associate Professor Warren.

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

POULTRY FARM ORGANIZATION. See Advanced Farm Organization (Ag. Ec. 206.)

POULTRY BACTERIOLOGY. See Poultry Bacteriology (Bact. 216).

POULTRY ANATOMY. See Special Anatomy (Anat. 201).

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

208. GENETICS OF DROSOPHILA. Elective second semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Genetics (An. Husb. 221.) Associate Professor Warren.

This course is designed primarily for graduate students who are doing major or minor work in genetics. Exceptional undergraduates may also be admitted. Lectures and assigned readings review the literature upon the genetics of Drosophila.

*Laboratory.*—The laboratory work consists of breeding problems illustrating the more fundamental genetic phenomena observed in Drosophila. Lectures may be taken without the laboratory work.

210. GENETICS SEMINAR. Elective, first and second semesters. One semester credit. Prerequisites: Consult instructors. Professors Nabours, Ibsen, and Parker, and Associate Professor Warren.

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.

215. POULTRY MANAGEMENT. Junior and senior elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Poult. Husb. 101. Professor Payne.

In this course a detailed study of all phases of the farm flock will be made. This will include the reproduction of the flock; the production of market poultry and eggs, hatching eggs, baby chicks, and breeding stock; housing, feeding, and marketing the products and the best type of management to secure an even distribution of income each month of the year. Problems will be assigned consisting of a detailed account of a farm flock of poultry kept for a period of one year. A few farms will be visited by the class for practical demonstrations.

FOR GRADUATES

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

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 in 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 large usefulness in Kansas communities. Some of the agricultural courses that will interest teachers are: soils, farm crops, grain grading and judging, seed identification and weed control, agricultural economics, farm organization, farm cost accounting, marketing of farm products, meats, history of breeds and pedigrees, genetics, live-stock production, principles of feeding, elements of dairying, dairy judging, farm poultry production, small fruits, landscape gardening, and school gardening. 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 the Departments of Agricultural Engineering and Shop Practice. Some of the fundamental courses offered in these departments are: farm buildings, gas engines and tractors, farm equipment, farm machinery, farm carpentry, farm blacksmithing, and farm shop methods.

Brief information regarding many of these courses in the Summer School may be found in the department descriptions in this catalogue.

## 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 buildings, which were erected at a cost of over $175,000, and are thoroughly equipped throughout. Veterinary Hall 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 yet larger service to render in preventing disease 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 board 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.

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## 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) |
| Zoölogy and Embryology (Vet.) | | | |
| Zoöl. 109 | 5(3-6) | | |
| Military Science (Vet.) I | | Military Science (Vet.) II | |
| Mil. Tr. 121 | 1½(0-4) | Mil. Tr. 122 | 1½(0-4) |
| 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) |
| Dairy Judging | | Principles of Feeding | |
| Dairy Husb. 104 | 1(0-3) | An. Husb. 152 | 3(3-0) |
| Judging Market Live Stock | | Genetics | |
| An. Husb. 132 | 2(0-6) | An. Husb. 221 | 3(3-0) |
| Military Science (Vet.) III | | Military Science (Vet.) IV | |
| Mil. Tr. 123 | 1½(0-4) | Mil. Tr. 124 | 1½(0-4) |
| 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(1-2, 1)
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)
Ophthalmology
Surg. and Med. 183..... 1(1-0)
Jurisprudence
Anat. and Physiol. 161..... 1(1-0)
Pathology IV
Path. 214 ..... 3(2-3)
Meat Inspection
Path. 216 ..... 2(2-0)
Parasitology
Zoöl. 208 ..... 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)
Poultry Diseases
Bact. 217 ..... 2(2-0)
Operative Surgery
Surg. and Med. 121..... 1(0-3)
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

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

### Second Semester

Vaccine Manufacture II
Path. 230 ..... 2(1-3)

### 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 | |
|---|---|---|---|
| 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) |
| Soils Agron. 133 | 5(4-3) | Farm Crops Agron. 109 | 5(3-6) |
| Organic Chemistry (Agr.) Chem. 120 | 3(2-3) | | |
| Infantry I Mil. Tr. 103 | 1½(0-4) | Infantry II Mil. Tr. 104 | 1½(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. 219 | 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) | Agricultural Journalism Ind. Jour. 164 | 1(1-0) |
| | | Elements of Horticulture Hort. 108 | 4(3-3) |
| Electives[2] | 3 | Electives[2] | 2 |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| General Entomology Ent. 101 | 3(2-3) | Agricultural Relationships[3] Gen. Agric. 201 | 1(1-0) |
| Agricultural Economics Ag. Ec. 101 | 3(3-0) | Farm Orgonization Ag. Ec. 106 | 3(2-3) |
| 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] | 2 | 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 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. A dissecting guide is furnished by the department.

The department owns equipment valued at $6,954.

## 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. Laboratory deposit, $3.

107. ANATOMY II. Freshman year, second semester. Class work, four hours; laboratory, fifteen hours. Nine semester credits. Prerequisite: Anatomy I. 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 parts 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. Laboratory deposit, $5.

111. ANATOMY III. Sophomore year, first semester. Class work, one hour; dissection, twelve hours. Five semester credits. Prerequisite: Anatomy II. 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. Laboratory deposit, $5.

116. ANATOMY IV. Sophomore year, second semester. Class work, one hour; dissecting, six hours. Three semester credits. Prerequisite: Anatomy III. 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. Laboratory deposit, $5.

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 and Physiology: 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 IV. 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, or *Essentials of Veterinary Physiology,* by Paton and Orr.

*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 conditions 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. Laboratory deposit, $3.

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,* or *Essentials of Veterinary Physiology,* by Paton and Orr.

*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. Laboratory deposit, $3.

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.

## COURSES 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.* Laboratory deposit, $1.

## COURSES IN JURISPRUDENCE

FOR UNDERGRADUATES

161. JURISPRUDENCE. Senior year, first 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 rules and regulations issued by state and federal authorities.

# Pathology

Professor LIENHARDT
Associate Professor SCOTT
Assistant Professor KITSELMAN
Assistant Professor 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.

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 a fairly 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 course 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.

The equipment owned by the department is valued at $10,446.

## 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 fibres, 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, included 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. Laboratory deposit, $3.

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. Laboratory deposit, $3.

FOR GRADUATES AND UNDERGRADUATES

252. 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. Laboratory deposit, $3.

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 I 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. Laboratory deposit, $3.

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. II, by Adami and Nichols. Laboratory deposit, $3.

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. Laboratory deposit, $2.50.

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

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 disease 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. Laboratory deposit, $3.

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. Laboratory deposit, $3.

227. VACCINE MANUFACTURE I. Elective, first and second semesters. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Bact. 116. Doctor Scott.

This course takes up the theory and practice of immunization as applied to blackleg and hog cholera. The laboratory work consists in the isolation and identification of the blackleg organism and of related anaërobes and in the practical production of blackleg biological products and anti-hog-cholera serum and virus. Laboratory deposit, $3.

230. VACCINE MANUFACTURE II. Elective, first and second semesters. Class work, one hour; laboratory, three hours. Two semester credits. Doctor Scott.

This course consists of a series of lectures on the preparation and standardization of various veterinary biological products, such as tuberculin, bacterial vaccines, and bacterins. The laboratory work consists in the production of some of these products and in special work on blackleg biological products and anti-hog-cholera serum and virus. Laboratory deposit, $3.

FOR GRADUATES

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 Lienhardt.

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. Laboratory deposit, $3.

# Surgery and Medicine

Professor DYKSTRA
Associate Professor SCOTT
Associate Professor MCLEOD
Associate Professor FRICK
Instructor BULLARD

For instruction in surgery and clinics the equipment is excellent. The veterinary hospital, recently completed at a cost of more than $100,000, is equipped with every modern appliance for surgical operations and diagnosis of animal diseases. The hospital has capacity for more than fifty horses or cattle, and in addition, it can accommodate fifty small animals, such as sheep, swine, cats, dogs, etc. In addition to the foregoing, members of the clinical staff, accompanied by students, make trips into the surrounding country to give veterinary attention to ailing patients. In this way the students come in contact every year with the diseases of animals and their treatment. The work is always 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.

This department owns equipment to the value of $3,105.

## 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. Laboratory charge, $5.

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. 219. 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, Frick, and Bullard.

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. Key deposit, 50 cents.

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

This work is a continuation of Clinics I. Key deposit, 50 cents.

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

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. Key deposit, 50c.

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

This work is a continuation of Clinics III. Key deposit, 50c.

## COURSES IN MATERIA MEDICA

FOR UNDERGRADUATES

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

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 constitutents, 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 Bullard.

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. PHARAMACY. Junior year, first semester. Class and laboratory work, three hours. One semester credit. Doctor Bullard.

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 incompatibilties, 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.* Laboratory deposit, $3.

## COURSES IN MEDICINE

FOR UNDERGRADUATES

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

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 Frick.

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, and larynx, bronchi, lungs, and pleura.

177. DISEASES OF LARGE ANIMALS II. Senior year, first semester. Class work, five hours. Five semester credits. Doctor Frick.

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 Frick.

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 disease, 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, first semester. Class work, one hour. One semester credit. Doctor Scott.

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 Frick.

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 Phyiol. 131. Doctor Bullard.

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, chemical engineering, civil engineering, electrical engineering, flour-mill engineering, mechanical engineering and landscape architecture 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 oil industry. 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. 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:

One- or two-year courses in auto mechanics, carpentry, blacksmithing, foundry practice, and machine shop work.

Short special courses for automobile mechanics, tractor operators, carpenters, machinists, blacksmiths, electricians, and foundry men.

These are all discussed elsewhere in this catalogue.

## STATE TEACHER'S CERTIFICATE

By substituting nine credit hours of work in the Department of Education a four-year curriculum in engineering may lead not only to the degree of Bachelor of Science in Engineering, but at the same time qualify the student for a three-year Kansas state teacher's certificate, renewable for three-year periods. By taking nine additional credit hours of work in the Department of Education, graduates in engineering are qualified for the three-year Kansas state teacher's 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 in his junior year.

## 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 ARCHITECTURAL ENGINEERING

The curriculum in architectural engineering as herein outlined is designed primarily for the student who wishes to specialize in the constructional side of the building profession.

The field of the architectural engineer is wide and varied. It comprises the superintending of building construction, general contracting, the estimating of costs for construction projects and the designing of the structural members of steel, timber and concrete.

Because of the nature of the work of the architectural engineer in the profession, it is necessary that he be also well grounded in the underlying principles of art and architectural design. In addition to the necessary architectural and engineering requirements, the curriculum also provides for general cultural courses. These courses are designed to provide the student with the essentials of a liberal education.

## 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 CHEMICAL ENGINEERING

Though the progress of chemical science and of the chemical industries has been rapid in the last twenty-five years, their development really has only begun. One need but survey briefly the hosts of industries which are depend-

ent upon chemistry for their improvement to realize what opportunities await the trained chemical engineer. Industries which have been more or less empirically developed include those concerned with the manufacture of paints and varnishes, soaps, glass, leather, rubber and ceramic materials. Industrial products which are the direct result of chemical research include dyes, synthetic essential oils, drugs, food products, and all electrochemical and electrothermal products, such as calcium carbide, carborundum, graphite, caustic soda, chlorine, chlorates, aluminum and other metals, and atmospheric nitrates. Still further improvements are possible in the present processes and a vast number of entirely new industries are waiting to be developed.

The training offered in the chemical engineering curriculum gives the student knowledge of the theoretical phases of chemistry and engineering which are fundamental to further development in many lines of industrial work. It is intended to fit him to enter the professional field of chemical engineering. In addition to sound training in chemical laws and processes, considerable work is given in the mathematical and physical sciences, drawing, economics, and engineering methods and operations.

## 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 cultural 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 LANDSCAPE ARCHITECTURE

The aim of the curriculum in landscape architecture is to give to the student such technical training as will equip him for successful practice as a landscape architect.

The work of the landscape architect embraces the design, construction, execution, planting, and maintenance of farmsteads, estates, and other home grounds. In his work he is also called upon to plan parks, playgrounds, real estate subdivisions, country clubs, and boulevards and street systems. City planning and the laying out of town sites is probably the most important work of the landscape architect.

The function of the landscape architect is the fitting of land for human use, convenience and enjoyment, whether it be in the city or in the country. The work requires a thorough knowledge of the fundamentals of architecture, engineering, and horticulture. Because landscape architecture is primarily a fine art, especial emphasis is given to the study of the fundamental principles of design. A major portion of the curriculum is therefore devoted to the study of architectural and landscape design. These courses are supplemented with courses in drafting, free-hand drawing, and sketching, so the student may develop a facility for expressing his ideas on paper. Throughout the course the student is also given intensive training in the study of plant materials, forestry, and soil conditions.

In addition to professional courses of study, the curriculum provides general cultural courses. These courses are designed primarily to give the student the basic elements of a liberal education.

## 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 machinery and various 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<br>Chem. 107 | 4(3-3) | Chemistry E-II<br>Chem. 108 | 4(3-3) |
| Plane Trigonometry*<br>Math. 101 | 3(3-0) | College Algebra*<br>Math. 104 | 3(3-0) |
| College Rehtoric I<br>Engl. 101 | 3(3-0) | College Rhetoric II<br>Engl. 104 | 3(3-0) |
| Engineering Drawing<br>Mach. Design 101 | 2(0-6) | Descriptive Geometry<br>Mach. Design 106 | 2(0-6) |
| Judging Market Live Stock<br>An. Husb. 132 | 2(0-6) | Field Machinery<br>Ag. Engr. 106, 107 | 2(1-3) |
| Extempore Speech I<br>Pub. Spk. 106 | 2(2-0) | Engineering Woodwork I<br>Shop 101 | 1(0-3) |
| | | Forging I<br>Shop 150 | 1(0-3) |
| Artillery I<br>Mil. Tr. 113 | 1½(0-4) | Artillery II<br>Mil. Tr. 114 | 1½(0-4) |
| Engineering Lectures<br>Gen. Engr. 101 | R | Engineering Lectures<br>Gen. Engr. 101 | R |
| Physical Eduuation M-I<br>Phys. Ed. 103 | R(0-2) | Physical Education M-II<br>Phys. Ed. 104 | R(0-2) |

### SOPHOMORE

| First Semester | | Second Semester | |
|---|---|---|---|
| Engineering Physics I<br>Physics 145 | 5(4-3) | Engineering Physics II<br>Physics 150 | 5(4-3) |
| Plane Analytical Geometry<br>Math. 110 | 4(4-0) | Calculus I<br>Math. 205 | 5(5-0) |
| American Industrial History<br>Hist. 105 | 3(3-0) | General Geology<br>Geol. 103 | 3(3-0) |
| Mechanism<br>Mach. Design 121 | 3(3-0) | Machine Drawing I<br>Mach. Design 111 | 2(0-6) |
| Surveying I<br>Civ. Engr. 102 | 2(0-6) | Surveying II<br>Civ. Engr. 111 | 2(0-6) |
| Artillery III<br>Mil. Tr. 115 | 1½(0-4) | Artillery IV<br>Mil. Tr. 116 | 1½(0-4) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |
| Physical Education M-III<br>Phys. Ed. 105 | R(0-2) | Physical Education M-IV<br>Phys. Ed. 106 | R(0-2) |

* Students who offer but one unit of algebra for admission take a five-hour course in College Algebra, Math. 107, the first semester, postponing Trigonometry and two hours of other work until the second semester.

## JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Applied Mechanics<br>Ap. Mech. 202 | 4(4-0) | Strength of Materials<br>Ap. Mech. 211, 220 | 6(5-3) |
| Calculus II<br>Math. 206 | 3(3-0) | Farm Motors<br>Ag. Engr. 125, 126 | 3(2-3) |
| Soils<br>Agron. 133 | 5(4-3) | Farm Crops<br>Agron. 109 | 5(3-6) |
| Organic Chemistry (Agr.)<br>Chem. 120 | 3(2-3) | Feeding Live Stock<br>An. Husb. 172 | 3(3-0) |
| Power Machinery<br>Ag. Engr. 111, 112 | 2(1-3) | Metallography<br>Shop 167 | 1(0-3) *or* |
| | | Foundry Practice<br>Shop 160 | 1(0-3) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Economics<br>Econ. 101 | 3(3-0) | Farm Organization<br>Ag. Ec. 106 | 3(2-3) |
| Tractors and Trucks<br>Ag. Engr. 116, 117 | 3(2-3) | Drainage and Irrigation I<br>Civ. Engr. 161 | 2(2-0) |
| Farm Buildings<br>Ag. Engr. 103 | 3(1-6) | Electrical Engineering C<br>Elect. Engr. 160, 165 | 3(2-2, 1) |
| Highway Engineering I<br>Civ. Engr. 230 and<br>Ap. Mech. 250 | 3(2-3) | Steam and Gas Engineering C<br>Mech. Engr. 120, 125 | 3(2-3) |
| Hydraulics<br>Ap. Mech. 230, 235 | 4(3-3) | Machine Tool Work I<br>Shop 170 | 2(0-6) |
| | | Engineering English<br>Engl. 110 | 2(2-0) |
| Commercial Law<br>Hist. 160 | 1(1-0) | Business Organization<br>Econ. 106 | 1(1-0) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |
| Thesis<br>Ag. Engr. 175 | 1(0-3) | Thesis<br>Ag. Engr. 175 | 2(0-6) |

# Curriculum in Architectural 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-1<br>Chem. 107 | 4(3-3) | Chemistry E-II<br>Chem. 108 | 4(3-3) |
| Plane Trigonometry*<br>Math. 101 | 3(3-0) | College Algebra*<br>Math. 104 | 3(3-0) |
| College Rhetoric I<br>Engl. 101 | 3(3-0) | College Rhetoric II<br>Engl. 104 | 3(3-0) |
| Engineering Drawing<br>Mach. Design 101 | 2(0-6) | Descriptive Geometry<br>Mach. Design 106 | 2(0-6) |
| Object Drawing I<br>Arch. 111 | 2(0-6) | Object Drawing II<br>Arch. 114 | 2(0-6) |
| Extempore Speech I<br>Pub. Spk. 106 | 2(2-0) | Surveying I<br>Civ. Eng. 102 | 2(0-6) |
| Artillery I<br>Mil. Tr. 113 | 1½(0-4) | Artillery II<br>Mil. Tr. 114 | 1½(0-4) |
| Engineering Lectures<br>Gen. Engr. 101 | R | Engineering Lectures<br>Gen. Engr. 101 | R |
| Physical Education M-I<br>Phys. Ed. 103 | R(0-2) | Physical Education M-II<br>Phys. Ed. 104 | R(0-2) |

* 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 and two hours of other work until the second semester.

## SOPHOMORE.

| First Semester. | | Second Semester. | |
|---|---|---|---|
| Engineering Physics I<br>Physics 145 | 5(4-3) | Engineering Physics II<br>Physics 150 | 5(4-3) |
| Plane Analytical Geometry<br>Math. 110 | 4(4-0) | Calculus I<br>Math. 205 | 5(5-0) |
| History of Architecture I<br>Arch. 154A | 2(2-0) | History of Architecture II<br>Arch. 157A | 2(2-0) |
| Elements of Architecture I<br>Arch. 106A | 3(0-9) | Elements of Architecture II<br>Arch. 107A | 3(0-9) |
| Shades and Shadows<br>Arch. 130 | 1(0-3) | Perspective<br>Arch. 126 | 1(0-3) |
| Pencil Rendering and Sketching<br>Arch. 116 | 2(0-6) | | |
| Artillery III<br>Mil. Tr. 115 | 1½(0-4) | Artillery IV<br>Mil. Tr. 116 | 1½(0-4) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |
| Prysical Education M-III<br>Phys. Ed. 105 | R(0-2) | Physical Education M-IV<br>Phys. Ed. 106 | R(0-2) |

## JUNIOR.

| First Semester. | | Second Semester. | |
|---|---|---|---|
| Applied Mechanics<br>Ap. Mech. 202 | 4(4-0) | Strength of Materials<br>Ap. Mech. 211, 220 | 6(5-3) |
| Calculus II<br>Math. 206 | 3(3-0) | Water Color I<br>Arch 118 | 2(0-6) |
| Masonry and Foundations<br>Civ. Engr. 120 | 2(2-0) | Working Drawings and Specifications<br>Arch. 191 | 3(0-9) |
| Design I<br>Arch. 142 | 3(0-9) | Design II<br>Arch. 144 | 3(0-9) |
| History of Architecture III<br>Arch. 158A | 2(2-0) | History of Architecture IV<br>Arch. 160A | 2(2-0) |
| Electrical Machinery and Construction<br>Elect. Engr. 170 | 2(0-6) | | |
| Elective† | 2( - ) | Elective† | 2( - ) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Stresses in Framed Structures<br>Civ. Eng. 201 | 4(4-0) | Design of Framed Structures<br>Civ. Engr. 246 | 3(0-9) |
| Civil Engineering Drawing II<br>Civ. Engr. 205 | 2(0-6) | Engineering English<br>Engl. 110 | 2(2-0) |
| Design III<br>Arch. 145 | 5(0-15) | Design IV<br>Arch. 147 | 5(0-15) |
| Economics<br>Econ. 101 | 3(3-0) | Concrete Design<br>Civ. Engr. 250, 255 | 3(2-3) |
| Business Law A<br>Hist. 161 | 2(2-0) | Steam and Gas Engineering C<br>Mech. Engr. 120, 125 | 3(2-3) |
| Elective † | 2( - ) | Business Management<br>Econ. 126 | 2(2-0) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

# 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) |
| History of Architecture I Arch. 154A | 2(2-0) | History of Architecture II Arch. 157A | 2(2-0) |
| College Rhetoric I Engl. 101 | 3(3-0) | College Rhetoric II Engl. 104 | 3(3-0) |
| Engineering Drawing Mach. Design 101 | 2(0-6) | Descriptive Geometry Mach. Design 106 | 2(0-6) |
| Object Drawing I Arch. 111 | 2(0-6) | Object Drawing II Arch. 114 | 2(0-6) |
| Elements of Architecture I Arch. 106A | 3(0-9) | Elements of Architecture II Arch. 107A | 3(0-9) |
| Shades and Shadows Arch. 130 | 1(0-3) | Perspective Arch. 126 | 1(0-3) |
| Artillery I Mil. Tr. 113 | 1½(0-4) | Artillery II Mil. Tr. 114 | 1½(0-4) |
| Engineering Lectures Gen. Engr. 101 | R | Engineering Lectures Gen. Engr. 101 | R |
| Physical Education M-I (Men) *or* Phys. Ed. 103 | R(0-2) | Physical Education M-II (Men) *or* Phys. Ed. 104 | R(0-2) |
| Physical Education W-1 (Women) Phys. Ed. 151A | 1(0-3) | Physical Education W-11 (Women) Phys. Ed. 152A | 1(0-3) |

## SOPHOMORE

| First Semester | | Second Semester | |
|---|---|---|---|
| Engineering Physics 1 Physics 145 | 5(4-3) | Engineering Physics 11 Physics 150 | 5(4-3) |
| History of Architecture III Arch. 158A | 2(2-0) | History of Architecture IV Arch. 160A | 2(2-0) |
| Building Materials and Construction Arch. 187A | 3(3-0) | Working Drawings and Specifications Arch. 191 | 3(0-9) |
| Pencil Rendering and Sketching Arch. 116 | 2(0-6) | Water Color I Arch. 118 | 2(0-6) |
| Design I Arch. 142 | 3(0-9) | Design II Arch. 144 | 3(0-9) |
| Advanced Composition I Engl. 113 | 2(2-0) | Advanced Composition II Engl. 116 | 2(2-0) |
| Artillery III Mil. Tr. 115 | 1½(0-4) | Artillery IV Mil. Tr. 116 | 1½(0-4) |
| Seminar Gen. Engr. 105 | R | Seminar Gen. Engr. 105 | R |
| Physical Education M-III (Men) *or* Phys. Ed. 105 | R(0-2) | Physical Education M-IV (Men) *or* Phys. Ed. 106 | R(0-2) |
| Physical Education W-III (Women) Phys. Ed. 153 | 1(0-3) | Physical Education W-IV (Women) 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 and two hours of other work until the second semester.

### JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Applied Mechanics A<br>Ap. Mech. 102 | 3(3-0) | Strength of Materials A<br>Ap. Mech. 116, 121 | 4(3-3) |
| Still Life Drawing<br>Arch. 117 | 2(0-6) | Life Drawing I<br>Arch. 121 | 2(0-6) |
| Design III<br>Arch. 145 | 5(0-15) | Design IV<br>Arch. 147 | 5(0-15) |
| French I<br>Mod. Lang. 151 | 3(3-0) | French II<br>Mod. Lang. 152 | 3(3-0) |
| Clay Modeling<br>Arch. 133 | 2(0-6) | Economics<br>Econ. 101 | 3(3-0) |
| Extempore Speech<br>Pub. Spk. 106 | 2(2-0) | Business Organization<br>Econ. 106 | 1(1-0) |
| Commercial Law<br>Hist. 160 | 1(1-0) | | |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |

### SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| History of Civilization and Art I<br>Arch. 178 | 2(3-0) | History of Civilization and Art II<br>Arch. 182 | 2(3-0) |
| Interior Decoration<br>Arch. 120 | 2(0-6) | Life Drawing II<br>Arch. 123 | 2(0-6) |
| Design V<br>Arch. 148 | 8(0-24) | Design VI<br>Arch. 151 | 8(0-24) |
| Theory of Structures I<br>Arch. 192 | 4(2-6) | Theory of Structures II<br>Arch. 194 | 3(1-6) |
| Elective† | 2( - ) | Engineering English<br>Engl. 110 | 2(2-0) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |

## Curriculum in Chemical 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<br>Chem. 107 | 4(3-3) | Chemistry E-II<br>Chem. 108 | 4(3-3) |
| Plane Trigonometry*<br>Math. 101 | 3(3-0) | College Algebra*<br>Math. 104 | 3(3-0) |
| College Rhetoric I<br>Engl. 101 | 3(3-0) | College Rhetoric II<br>Engl. 104 | 3(3-0) |
| Engineering Drawing<br>Mach. Des. 101 | 2(0-6) | Descriptive Geometry<br>Mach. Des. 106 | 2(0-6) |
| Extempore Speech I<br>Pub. Spk. 106 | 2(2-0) | Machine Drawing I<br>Mach. Des. 111 | 2(0-6) |
| Engineering Woodwork I<br>Shop 101 | 1(0-3) | Metallurgy<br>Shop 165 | 2(2-0) |
| Forging I<br>Shop 150 | 1(0-3) | | |
| Artillery I<br>Mil. Tr. 113 | 1½(0-4) | Artillery II<br>Mil. Tr. 114 | 1½(0-4) |
| Engineering Lectures<br>Gen. Engr. 101 | R | Engineering Lectures<br>Gen. Engr. 101 | R |
| Physical Education M-I<br>Phys. Ed. 103 | R(0-2) | Physical Education M-II<br>Phys. Ed. 104 | R(0-2) |

* 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 and two hours of other work until the second semester.

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

## 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. 205 | 5(5-0) |
| Adv. Inorg. Chemistry | | Quantitative Analysis | |
| Chem. 207 | 3(3-0) | Chem. 241 | 5(1-12) |
| Inorganic Preparations | | Metallography | |
| Chem. 202 | 2(0-6) | Shop 167 | 1(0-3) |
| American Industrial History | | Library Methods | |
| Hist. 105 | 3(3-0) | Lib. Ec. 101 | 1(1-0) |
| Artillery III | | Artillery IV | |
| Mil. Tr. 115 | 1½(0-4) | Mil. Tr. 116 | 1½(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 | |
|---|---|---|---|
| Calculus II | | Strength of Materials E | |
| Math. 206 | 3(3-0) | Ap. Mech. 216, 220 | 4(3-3) |
| Applied Mechanics | | Industrial Electrochemistry | |
| Ap. Mech. 202 | 4(4-0) | Chem. 205 | 2(2-0) |
| Steam and Gas Engineering I | | Steam and Gas Engineering II | |
| Mech. Engr. 101, 105§ | 5(4-3) | Mech. Engr. 110, 115§ | 4(3-3) |
| Organic Chemistry I | | Organic Chemistry II | |
| Chem. 218 | 4(2-6) | Chem. 219 | 4(2-6) |
| Commercial Law | | Economics | |
| Hist. 160 | 1(1-0) | Econ. 101 | 3(3-0) |
| Seminar | | Seminar | |
| Gen. Engr. 105 | R | Gen. Engr. 105 | R |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Industrial Chemistry I | | Industrial Chemistry II | |
| Chem. 203 | 5(3-6) | Chem. 204 | 5(3-6) |
| Electrical Engineering M-I | | Electrical Engineering M-II | |
| Elect. Engr. 230, 231 § | 4(3-2, 1) | Elect. Engr. 242, 243 § | 4(3-2, 1) |
| Physical Chemistry | | Engineering English | |
| Chem. 206 | 5(3-6) | Engl. 110 | 2(2-0) |
| Organic Preparations | | Fire Assaying | |
| Chem. 223 | 2(0-6) *or* | Chem. 242 | 2(0-6) |
| Qualitative Organic Analysis | | Gas Analysis | |
| Chem. 224 | 2(0-6) | Chem. 243 | 1(0-3) |
| Business Organization | | History of Chemistry | |
| Econ. 106 | 1(1-0) | Chem. 208 | 1(1-0) |
| Thesis | 1(0-3) | Thesis | 2(0-6) |
| Seminar | | Seminar | |
| Gen. Engr. 105 | R | Gen. Engr. 105 | R |

§ Students who wish to do so may replace these courses by German I (3 semester credits), German II (3 semester credits), Scientific German (4 semester credits), Steam and Gas Engineering C (3 semester credits), Electrical Engineering C (3 semester credits), Elective (1 semester credit).

## 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 | | 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 | |
| Mach. Design 101 | 2(0-6) | Mach. Design 106 | 2(0-6) |
| Surveying I | | Surveying II | |
| Civ. Engr. 102 | 2(0-6) | Civ. Engr. 111 | 2(0-6) |
| Extempore Speech I | | Engineering Woodwork I | |
| Pub. Spk. 106 | 2(2-0) | Shop 101 | 1(0-3) |
| | | Forging I | |
| | | Shop 150 | 1(0-3) |
| Artillery I | | Artillery II | |
| Mil. Tr. 113 | 1½(0-4) | Mil. Tr. 114 | 1½(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. 205 | 5(5-0) |
| American Industrial History | | Metallurgy | |
| Hist. 105 | 3(3-0) | Shop 165 | 2(2-0) |
| Surveying III | | Surveying IV | |
| Civ. Engr. 151, 155 | 3(2-3) | Civ. Engr. 156, 157 | 3(2-3) |
| Machine Drawing I | | Civil Engineering Drawing I | |
| Mach. Design III | 2(0-6) | Civ. Engr. 125 | 2(0-6) |
| Artillery III | | Artillery IV | |
| Mil. Tr. 115 | 1½(0-4) | Mil. Tr. 116 | 1½(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 | |
| Ap. Mech. 202 | 4(4-0) | Ap. Mech. 211, 220 | 6(5-3) |
| Calculus II | | Hydraulics | |
| Math. 206 | 3(3-0) | Ap. Mech. 230, 235 | 4(3-3) |
| Engineering Geology | | Railway Engineering I | |
| Geol. 102 | 4(2-6) | Civ. Engr. 145 | 2(2-0) |
| Masonry and Foundations | | Drainage and Irrigation I | |
| Civ. Engr. 120 | 2(2-0) | Civ. Engr. 161 | 2(2-0) |
| Economics | | Steam and Gas Engineering C | |
| Econ. 101 | 3(3-0) | Mech. Engr. 120, 125 | 3(2-3) |
| Commercial Law | | | |
| Hist. 160 | 1(1-0) | | |
| Seminar | | Seminar | |
| Gen. Engr. 105 | R | Gen. Engr. 105 | R |

* 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 and two hours of other work until the second semester.

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Stresses in Framed Structures Civ. Engr. 201 | 4(4-0) | Design of Framed Structures 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) |
| | | Railway Engineering II Civ. Engr. 260, 265 | 4(2-6) *or* |
| | | Highway Engineering II Civ. Engr. 270, 275 | 4(2-6) *or* |
| Highway Engineering I Civ. Engr. 230 and Ap. Mech. 250 | 3(2-3) | 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) |

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# 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 Mach. Design 101 | 2(0-6) | Descriptive Geometry Mach. Design 106 | 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) | Electrical Machinery and Construction Elect. Engr. 170 | 2(0-6) *or* |
| Surveying I Civ. Engr. 102 | 2(0-6) | Surveying I Civ. Engr. 102 | 2(0-6) |
| Artillery I Mil. Tr. 113 | 1½(0-4) | Artillery II Mil. Tr. 114 | 1½(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) |

* 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 and two hours of other work until the second semester.

## SOPHOMORE

| First Semester | | Second Semester | |
|---|---|---|---|
| Engineering Physics I<br>Physics 145 | 5(4-3) | Engineering Physics II<br>Physics 150 | 5(4-3) |
| Plane Analytical Geometry<br>Math. 110 | 4(4-0) | Calculus I<br>Math. 205 | 5(5-0) |
| Mechanism<br>Mach. Design 121 | 3(3-0) | American Industrial History<br>Hist. 105 | 3(3-0) |
| Machine Drawing I<br>Mach. Design 111 | 2(0-6) | Machine Drawing II<br>Mach. Design 116 | 3(0-9) |
| Metallurgy<br>Shop 165 | 2(2-0) | | |
| Foundry Practice<br>Shop 160 | 1(0-3) | Metallography<br>Shop 167 | 1(0-3) |
| Artillery III<br>Mil. Tr. 115 | 1½(0-4) | Artillery IV<br>Mil. Tr 116 | 1½(0-4) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |
| Physical Education M-III<br>Phys. Ed. 105 | R(0-2) | Physical Education M-IV<br>Phys. E. 106 | R(0-2) |

## JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Applied Mechanics<br>Ap. Mech. 202 | 4(4-0) | Strength of Materials E<br>Ap. Mech. 216, 220 | 4(3-3) |
| Calculus II<br>Math. 206 | 3(3-0) | Hydraulics<br>Ap. Mech. 230, 235 | 4(3-3) |
| Economics<br>Econ. 101 | 3(3-0) | Pattern Making<br>Shop 145 | 1(0-3) |
| Direct-current Machines I<br>Elect. Engr. 203, 204 | 4(3-2, 1) | Direct-current Machines II<br>Elect. Engr. 206, 207 | 3(2-2, 1) |
| Electrical Measurements<br>Elect. Engr. 227, 228 | 3(2-2, 1) | Alternating-current Machines I<br>Elect. Engr. 209, 211 | 5(4-2, 1) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Steam and Gas Engineering I<br>Mech. Engr. 101, 105 | 5(4-3) | Steam and Gas Engineering II<br>Mech. Engr. 110, 115 | 4(3-3) |
| Alternating-current Machines II<br>Elect. Engr. 213, 215 | 6(4-4, 2) | Commercial Law<br>Hist. 160 | 1(1-0) |
| Electrical Machine Design I<br>Elect. Engr. 270 | 1(0-3) | Business Organization<br>Econ. 106 | 1(1-0) |
| Factory Engineering<br>Shop 245, 250 | 2(1-3) | Engineering English<br>Engl. 110 | 2(2-0) |
| | | Machine Tool Work 1<br>Shop 170 | 2(0-6) |
| Elective† | 4( - ) | Elective† | 7( - ) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

## 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 | |
| Mach. Design 101 | 2(0-6) | Mach. Design 106 | 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 | 1½(0-4) | Mil. Tr. 114 | 1½(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. 205 | 5(5-0) |
| Organic Chemistry (Agr.) | | Mechanism | |
| Chem. 120 | 3(2-3) | Mach. Design 121 | 3(3-0) |
| Machine Drawing I | | Machine Drawing II | |
| Mach. Design 111 | 2(0-6) | Mach. Design 116 | 3(0-9) |
| Quantitive Analysis A | | Principles of Milling | |
| Chem. 250 | 3(1-6) | Mill. Ind. 101 | 1(0-3) |
| Artillery III | | Artillery IV | |
| Mil. Tr. 115 | 1½(0-4) | Mil. Tr. 116 | 1½(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) |

* Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing Plane Trigonometry and two hours of other work until the second semester.

## JUNIOR

### First Semester

Applied Mechanics
Ap. Mech. 202..... 4(4-0)
Calculus II
Math. 206 ..... 3(3-0)
Advanced Quantitative Analysis
Chem. 260 ..... 1(0-3)
American Industrial History
Hist. 105 ..... 3(3-0)
Farm Crops Laboratory
Agron. 109 ..... 2(0-6)
Milling Practice I
Mill. Ind. 109..... 3(1-6)
Milling Entomology
Ent. 116 ..... 1(1-0)
Seminar
Gen. Engr. 105..... R

### Second Semester

Strength of Materials E
Ap. Mech. 216, 220..... 4(3-3)
Hydraulics
Ap. Mech. 230, 235..... 4(3-3)
Commercial Law
Hist. 160 ..... 1(1-0)
Economics
Econ. 101 ..... 3(3-0)
Grain Grading and Judging
Agrom. 108 ..... 2(0-6)
Milling Qualities of Wheat and Other Cereals
Mill Ind. 211 ..... 2(2-0)
Milling Practice II
Mill. Ind. 110..... 2(0-6)
Seminar
Gen. Engr. 105..... R

## SENIOR

### First Semester

Wheat and Flour Testing
Mill. Ind. 203..... 4(1-9)
Grain Marketing
Ag. Ec. 203..... 3(3-0)
Flour-mill Design
Mach. Design 215..... 2(0-6)
Steam and Gas Engineering I
Mech. Engr. 101, 105..... 5(4-3)
Business Organization
Econ. 106 ..... 1(1-0)
Factory Engineering
Shop 245, 250..... 2(1-3)
Seminar
Gen. Engr. 105..... R
Thesis
Mach. Design 126, Mech. Engr. 195, Mill. Ind. 115, *or* Shop 195..... 1(0-3)

### Second Semester

Experimental Baking A
Mill. Ind. 204..... 2(0-6)
Steam and Gas Engineering II
Mech. Engr. 110, 115..... 4(3-3)
Refrigeration, Heating and Ventilation
Mech. Engr. 210, 215..... 3(2-3)
Electrical Engineering C
Elect. Engr. 160, 165..... 3(2-2, 1)
Engineering English
Engl. 110 ..... 2(2-0)
Machine Tool Work I
Shop 170 ..... 2(0-6)
Seminar
Gen. Engr. 105..... R
Thesis
Mach. Design 126, Mech. Engr. 195, Mill. Ind. 115, *or* Shop 195..... 2(0-6)

## Curriculum in Landscape 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 | |
|---|---|---|---|
| College Algebra * Math. 104 | 3(3-0) | Plane Trigonometry * Math. 101 | 3(3-0) |
| College Rhetoric I Engl. 101 | 3(3-0) | College Rhetoric II Engl. 104 | 3(3-0) |
| Object Drawing I Arch. 111 | 2(0-6) | Object Drawing II Arch. 114 | 2(0-6) |
| Engineering Drawing Mach. Design 101 | 2(0-6) | Descriptive Geometry Mach. Design 106 | 2(0-6) |
| General Botany I Bot. 101 | 3(1-4, 2) | General Botany II Bot. 105 | 3(1-4, 2) |
| Elements of Architecture I Arch. 106A | 3(0-9) | Elements of Architecture II Arch. 107A | 3(0-9) |
| Artillery I (Men) Mil. Tr. 113 | 1½(0-4) | Artillery II (Men) Mil. Tr. 114 | 1½(0-4) |
| Physical Education M-I (Men) Phys. Ed. 103 | R(0-2) *or* | Physical Education M-II (Men) Phys. Ed. 104 | R(0-2) *or* |
| Physical Education W-I (Women) Phys. Ed. 151A | 1(0-3) | Physical Education W-II (Women) Phys. Ed. 152A | 1(0-3) |
| Engineering Lectures Gen. Engr. 101 | R | Engineering Lectures Gen. Engr. 101 | R |

### SOPHOMORE

| First Semester | | Second Semester | |
|---|---|---|---|
| History of Architecture I Arch. 154A | 2(2-0) | History of Architecture II Arch. 157A | 2(2-0) |
| Surveying I Civ. Engr. 102 | 2(0-6) | Surveying II Civ. Engr. 111 | 2(0-6) |
| Chemistry E-I Chem. 107 | 4(3-3) | Chemistry E-II Chem. 108 | 4(3-3)) |
| Landscape Gardening I Hort. 126 | 2(2-0) | Landscape Gardening II Hort. 238 | 3(0-9) |
| Shades and Shadows Arch. 130 | 1(0-3) | General Geology Geol. 103 | (3(3-0) |
| Plant Physiology I Bot. 130 | 3(3-0) | | |
| Design I Arch. 142 | 3(0-9) | Design II Arch. 144 | 3(0-9) |
| Artillery III (Men) Mil. Tr. 115 | 1½(0-4) | Artillery IV (Men) Mil. Tr. 116 | 1½(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) |
| Seminar Gen. Engr. 105 | R | Seminar Gen. Engr. 105 | R |

* Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing Plane Trigonometry and two hours of other work until the second semester.

## JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| History of Architecture III<br>Arch. 158A | 2(2-0) | History of Architecture IV<br>Arch. 160A | 2(2-0) |
| Pencil Rendering and Sketching<br>Arch. 116 | 2(0-6) | Water Color I<br>Arch. 118 | 2(0-6) |
| Surveying III<br>Civ. Engr. 151, 155 | 3(2-3) | Plant Materials in Landscape Gardening<br>Hort. 225 | 3(2-3) |
| Soils<br>Agron. 133 | 5(4-3) | Elements of Horticulture<br>Hort. 108 | 4(3-3) |
| History and Literature of Landscape Gardening<br>Hort. 222 | 2(2-0) | Civic Art<br>Hort. 223 | 3(3-0) |
| Theory and Æsthetics of Landscape Gardening<br>Hort. 242 | 3(3-0) | Silviculture<br>Hort. 119 | 3(2-3) |
| | | Perspective<br>Arch. 126 | 1(0-3) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Plant Pathology I<br>Bot. 205 | 3(1-4, 2) | Economics<br>Econ. 101 | 3(3-0) |
| Highway Engineering I<br>Civ. Engr. 230,<br>Ap. Mech. 250 | 3(2-3) | City Planning<br>Arch. 249 | 3(0-9) |
| Landscape Gardening III<br>Hort. 245 | 2(1-3) | Working Drawings and Specifications<br>Arch. 191 | 3(0-9) |
| Clay Modeling<br>Arch. 133 | 2(0-6) | | |
| Elective† | 2( - ) | Elective † | 5( - ) |
| Greenhouse Construction and Management<br>Hort. 128 | 3(3-0) | Tree Surgery<br>Hort. 233 | 2(1-3) |
| Building Materials and Construction<br>Arch. 187A | 3(3-0) | Engineering English<br>Engl. 110 | 2(2-0) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |

† Electives are to be chosen with the advice and approval of the head of the department and the dean.

## 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<br>Chem. 107 | 4(3-3) | Chemistry E-II<br>Chem. 108 | 4(3-3) |
| Plane Trigonometry *<br>Math. 101 | 3(3-0) | College Algebra *<br>Math. 104 | 3(3-0) |
| College Rhetoric I<br>Engl. 101 | 3(3-0) | College Rhetoric II<br>Engl. 104 | 3(3-0) |
| Engineering Drawing<br>Mach. Design 101 | 2(0-6) | Descriptive Geometry<br>Mach. Design 106 | 2(0-6) |
| Extempore Speech I<br>Pub. Spk. 106 | 2(2-0) | Surveying I<br>Civ. Engr. 102 | 2(0-6) |
| Engineering Woodwork 1<br>Shop 101 | 1(0-3 | Elements of Steam and Gas Power<br>Mech. Engr. 130 | 2(0-6) *or* |
| Forging I<br>Shop 150 | 1(0-3 | Engineering Woodwork I<br>Shop 101 | 1(0-3) |
| | | Forging I<br>Shop 150 | 1(0-3) |
| Elements of Steam and Gas Power<br>Mech. Engr. 130 | 2(0-6) | | |
| Artillery I<br>Mil. Tr. 113 | 1½(0-4) | Artillery II<br>Mil. Tr. 114 | 1½(0-4) |
| Engineering Lectures<br>Gen. Engr. 101 | R | Engineering Lectures<br>Gen. Engr. 101 | R |
| Physical Education M-I<br>Phys. Ed. 103 | R(0-2) | Physical Education M-II<br>Phys. Ed. 104 | R(0-2) |

### SOPHOMORE

| First Semester | | Second Semester | |
|---|---|---|---|
| Engineering Physics I<br>Physics 145 | 5(4-3) | Engineering Physics II<br>Physics 150 | 5(4-3) |
| Plane Analytical Geometry<br>Math. 110 | 4(4-0) | Calculus I<br>Math. 205 | 5(5-0) |
| Mechanism<br>Mach. Design 121 | 3(3-0) | American Industrial History<br>Hist. 105 | 3(3-0) |
| Machine Drawing I<br>Mach. Design 111 | 2(0-6) | Machine Drawing II<br>Mach. Design 116 | 3(0-9) |
| Metallurgy<br>Shop 165 | 2(2-0) | | |
| Metallography<br>Shop 167 | 1(0-3) | Foundry Practice<br>Shop 160 | 1(0-3) |
| Artillery III<br>Mil. Tr. 115 | 1½(0-4) | Artillery IV<br>Mil. Tr. 116 | 1½(0-4) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |
| Physical Education M-III<br>Phys. Ed. 105 | R(0-2) | Physical Education M-IV<br>Phys. Ed. 106 | R(0-2) |

* Students who offer but one unit of algebra for admission take a five-credit course in College Algebra, Math. 107, the first semester, postponing Plane Trigonometry and two hours of other work until the second semester.

## JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Applied Mechanics<br>Ap. Mech. 202 | 4(4-0) | Strength of Materials<br>Ap. Mech. 211, 220 | 6(5-3) |
| Calculus II<br>Math. 206 | 3(3-0) | Hydraulics<br>Ap. Mech. 230, 235 | 4(3-3) |
| Steam and Gas Engineering I<br>Mech. Engr. 101, 105 | 5(4-3) | Steam and Gas Engineering II<br>Mech. Engr. 110, 115 | 4(3-3) |
| Commercial Law<br>Hist. 160 | 1(1-0) | | |
| Pattern Making<br>Shop 145 | 1(0-3) | | |
| Graphic Statics<br>Ap. Mech. 225 | 1(0-3) | Machine Design I<br>Mach. Design 202 | 1(0-3) |
| Machine Tool Work I<br>Shop 170 | 2(0-6) | Machine Tool Work II<br>Shop 192 | 2(0-6) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Electrical Engineering M-I<br>Elect. Engr. 230, 231 | 4(3-2, 1) | Electrical Engineering M-II<br>Elect. Engr. 242, 243 | 4(3-2, 1) |
| Power Plant Engineering<br>Mech. Engr. 206 | 3(0-9) | Refrigeration, Heating and Ventilation<br>Mech. Engr. 210, 215 | 3(2-3)*or* |
| | | Aërodynamics<br>Mech. Engr. 220, 225 | 3(2-3) |
| Machine Design II<br>Mach. Design 204, 205 | 5(3-6) | Machine Design III<br>Mach. Design 210 | 2(0-6) |
| Factory Engineering<br>Shop 245, 250 | 2(1-3) | Factory Design<br>Shop 255 | 2(0-6)*or* |
| | | Automotive Engineering<br>Shop 270, 275 | 2(1-3) |
| Economics<br>Econ. 101 | 3(3-0) | Engineering English<br>Engl. 110 | 2(2-0) |
| | | Business Organization<br>Econ. 106 | 1(1-0) |
| | | Machine Tool Work III<br>Shop 193 | 1(0-3) |
| Seminar<br>Gen. Engr. 105 | R | Seminar<br>Gen. Engr. 105 | R |
| Thesis<br>Ap. Mech. 150, Mach. Design 126, Mech. Engr. 195, *or* Shop 195 | 1(0-3) | Thesis<br>Ap. Mech. 150, Mach. Design 126, Mech. Engr. 195, *or* Shop 195 | 2(0-6) |

# Agricultural Engineering

Professor WALKER
Associate Professor SANDERS
Assistant Professor DRIFTMIER
Assistant Professor HILLMAN
Assistant SMITH

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 $30,000, 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.

The department possesses equipment valued at $8,242.

## COURSES IN AGRICULTURAL ENGINEERING

FOR UNDERGRADUATES

103. FARM BUILDINGS. Senior year and elective, both semesters and summer school. Class work, one hour. Drafting-room practice, six hours. Three semester credits. Professor Walker and Assistant Professor Hillman.

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. Laboratory charge, $1.

111. POWER MACHINERY RECITATION. Junior year, first semester. Class work, one hour. One semester credit. Prerequisite: Field Machinery (Ag. Engr. 106). Assistant Professors Driftmier and Hillman.

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, first semester. Laboratory, three hours. One semester credit. Assistant Professors Driftmier and Hillman.

Laboratory and field instruction is given and tests are conducted upon the machines discussed in the classroom. Laboratory charge, $1.

116. TRACTORS AND TRUCKS RECITATION. Senior year, and elective, first semester. Lectures and recitations, two hours. Two semester credits. Prerequisite: Farm Motors (Ag. Engr. 125). Associate Professor Sanders.

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.

117. TRACTORS AND TRUCKS LABORATORY. Senior year, and elective, first semester. Laboratory, three hours. One semester credit. Associate Professor Sanders.

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. Laboratory charge, $2.

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, second semester. 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, second semester. Laboratory, three hours. One semester credit. Assistant Professor Driftmier.

Practice is given in rope work, belt lacing and splicing, soldering and pipe fitting, fencing, concrete work, and farm survey. Laboratory charge, $1.

125. FARM MOTORS RECITATION. Junior year, and elective, second semester. 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, second semester. 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. Laboratory charge, $2.

130. GAS ENGINES AND TRACTORS. Elective, first semester and summer school. Lectures and recitations, two hours; laboratory, three hours. Three semester credits. Associate Professor Sanders.

This course is a study of gas engines and tractors with special reference to their application to power work on the farm. The classroom work covers the

principles and application of the internal-combustion engine. The laboratory work includes the operation, testing, adjustment, care and use of the stationary gas engine and tractor for farm work. Text: Potter's *Farm Motors*. Laboratory charge, $2.

140. ELEMENTS OF IRRIGATION AND DRAINAGE RECITATION. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: Soils (Agron. 133). 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, first semester. 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. Laboratory charge, $1.

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 problems 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, second semester. 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. Professor Walker and Assistant Professors Driftmier and Hillman.

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. Laboratory charge, $1 for each hour of credit.

215. TRACTOR RESEARCH. Elective, first semester. 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. Laboratory charge, $2 for each hour credit.

FOR GRADUATES

301. AGRICULTURAL ENGINEERING RESEARCH. Elective, first or second semester. One semester credit for each three hours of laboratory work. Prerequisites: Soils (Agron. 133) and Engineering Physics II (Engr. Physics 150) or its equivalent. Professor Walker.

Many agricultural engineering problems in the design, use and application of machinery and equipment in the development of agriculture are open for extensive research. The laboratories of the College 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.

# Applied Mechanics

Professor SCHOLER
Associate Professor ROBERT
Assistant Professor WOJTASZAK
Assistant Professor DAWLEY
Assistant Professor CHEEK
Instructor ALLEN
Instructor SUMMERS

The aim of the courses in applied mechanics is to give to the engineering student a practical working knowledge of those fundamental principles of mechanics upon which his future work in structural and machine design may be based.

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. The equipment belonging to the department is valued at $27,869.

## COURSES IN APPLIED MECHANICS

FOR UNDERGRADUATES

102. APPLIED MECHANICS A. Junior year, first semester. Class work, three hours. Three semester credits. Prerequisites: Plane Trigonometry (Math. 101), and Engineering Physics 1 (Physics 145). Associate Professor Robert and Assistant Professor Cheek.

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.

116. STRENGTH OF MATERIALS A RECITATION. Junior year, second semester. Class work, three hours. Three semester credits. Prerequisites: Applied Mechanics A (Ap. Mech. 102). Associate Professor Robert and Assistant Professor Cheek.

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.

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 Cheek.

This course comprises 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. Laboratory charge, $2.

150. THESIS. Senior year, continuing through the year. First semester: laboratory, three hours; one semester credit. Second semester: laboratory, six hours; two semester credits. Professor Scholer, and Associate Professor Robert.

The laboratories of the department furnish an excellent opportunity for ex-

perimental work in strength of materials, road materials, concrete and hydraulics, suitable for thesis projects of students in any branch of engineering. 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

202. APPLIED MECHANICS. Junior year, both semesters and summer school. Class work, four hours. Four semester credits. Prerequisites: Calculus I (Math. 205) and Engineering Physics II (Physics 150). Professor Scholer, Associate Professor Robert, Assistant Professor Wojtaszak and Mr. Summers.

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.*

211. STRENGTH OF MATERIALS RECITATION. Junior year, both semesters and summer school. Class work, five hours. Five semester credits. Prerequisite: Applied Mechanics (Ap. Mech. 202). Professor Scholer, Associate Professor Robert, Assistant Professor Wojtaszak and Mr. Allen.

This course embraces a study of 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 Urquhart and O'Rourke's *Design of Concrete Structures.* Carnegie's *Pocket Companion* is used for reference.

216. STRENGTH OF MATERIALS E RECITATION. Junior year, both semesters and summer school. Class work, three hours. Three semester credits. Prerequisite: Applied Mechanics (Ap. Mech. 202). Associate Professor Robert and Assistant Professor 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.

220. STRENGTH OF MATERIALS LABORATORY. Junior year, both semesters and summer school. Laboratory work, three hours. One semester credit. Must accompany or follow Strength of Materials or Strength of Materials E Recitation. Associate Professor Robert, Assistant Professors Wojtaszak and 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. Text: Hatt and Schofield's *Laboratory Manual for Testing Materials.* Laboratory charge, $2.

225. 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. Text: Hudson and Squire's *Elements of Graphic Statics.*

230. HYDRAULICS RECITATION. Junior and senior years, both semesters and summer school. Class work, three hours. Three semester credits. Prerequisite: Applied Mechanics (Ap. Mech. 202). Associate Professor Robert, Assistant Professor Wojtaszak and Mr. Summers.

This course comprises a study of fluid pressures, stresses in containing ves-

sels 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*.

235. HYDRAULICS LABORATORY. Junior and senior years, both semesters. Laboratory work, three hours. One semester credit. Must accompany or follow Hydraulics Recitation (Ap. Mech. 230). Associate Professor Robert and Assistant Professor 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. Laboratory charge, $1.

250. HIGHWAY ENGINEERING I LABORATORY. Senior year, first semester. Laboratory work, three hours. One semester credit. Prerequisite: Strength of Materials Laboratory (Ap. Mech. 220). Professor Scholer and Mr. Allen.

This is a comprehensive course in the examination and testing of bituminous and nonbituminous road materials. Text: Blanchard's *Highway Engineers' Handbook*. Laboratory charge, $1.50.

260. ADVANCED APPLIED KINETICS. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Strength of Materials (Ap. Mech. 211), or Strength of Materials E (Ap. Mech. 216). Associate Professor Robert.

Advanced problems in kinetics are given with special attention to the kinetics of rigid bodies.

265. ADVANCED MECHANICS OF MATERIALS. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: Strength of Materials (Ap. Mech. 210), or Strength of Materials E (Ap. Mech. 216). 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 semester. Class work, two hours. Two semester credits. Prerequisite: Hydraulics (Ap. Mech. 230). Associate Professor Robert.

A study is made of the characteristics and applications of water wheels, turbines, pumps, and other hydraulic machinery.

275. ROAD MATERIALS. Elective, second semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Highway Engineering I Laboratory (Ap. Mech. 250). 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 semester. Class work, two hours. Two semester credits for students who have not taken Strength of Materials (Ap. Mech. 211) or its equivalent. Prerequisite: Strength of Materials E (Ap. Mech. 216). 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. Professor Scholer and Associate Professor Robert.

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.

# Architecture

Professor WEIGEL
Professor WALTERS (Emeritus)
Associate Professor KLEINSCHMIDT
Assistant Professor CHEEK
Instructor HELM
Instructor WICHERS

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 ornaments 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.

The department owns equipment valued at $6,534.

## COURSES IN ARCHITECTURE

FOR UNDERGRADUATES

106A. ELEMENTS OF ARCHITECTURE I. Freshman year, first semester. Drafting room, nine hours. Three semester credits. Professor Weigel and Mr. Wichers.

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 draftsmanship. Text: Pierre Esquire's *Traite Elementaire d'Architecture Comprenant l'Etude Complete des Cinq Ordres.* Laboratory deposit, $1.

107A. ELEMENTS OF ARCHITECTURE II. Freshman year, second semester. Drafting room, nine hours. Three semester credits. Prerequisite: Elements of Architecture (Arch. 106A). Professor Weigel and Mr. Wichers.

This is a continuation of Elements of Architecture 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. Laboratory deposit, $1.

111. OBJECT DRAWING I. Freshman year, both semesters. Studio, six hours. Two semester credits. Mr. Helm.

This course comprises the drawing of simple geometric objects as exercises in developing the powers of observation, as well as in training the hand. Special attention is given to representations of the third dimensions. Later in the semester studies are made from fragments of antique architectural ornaments.

114. OBJECT DRAWING II. Freshman year, second semester. Studio, six hours. Two semester credits. Prerequisite: Object Drawing I (Arch. 111). Mr. Helm.

This is an amplification and expansion of the principles taught in Object Drawing I as applied to architectural ornament and to architectural fragments. The work consists of drawing in charcoal and pencil from casts.

116. PENCIL RENDERING AND SKETCHING. Sophomore year, first semester. Studio, six hours. Two semester credits. Prerequisite: Object drawing II (Arch. 114). Mr. Helm.

This course comprises the drawing of architectural ornament, architectural fragments, and parts of the human figure with attention being given to the representation of the third dimension in pencil. In the latter half of the semester pencil sketches are made from nature.

117. STILL-LIFE DRAWING. Junior year, first semester. Studio, six hours. Two semester credits. Prerequisite: Water Color I (Arch. 118). Mr. Helm.

Advanced studies are made of the human figure from full-length plaster casts. The study of the third dimension is continued in still-life groups in charcoal. Pen and ink rendering is taken up.

118. WATER COLOR I. Sophomore year, second semester. Studio six hours. Two semester credits. Prerequisite: Pencil Rendering and Sketching (Arch. 116), or by approval of instructor. Mr. Helm.

In this course exercises are given in the handling of the medium and of the translation of color. The theory of color is also studied.

120. INTERIOR DECORATION. Senior year, first semester. Studio, six hours. Two semester credits. Prerequisites: Design I (Arch. 142) and General History of Architecture (Arch. 244). Mr. Helm.

In this course the principles of interior architecture are studied, special attention being given to the designing of English, Italian, French, and Colonial interiors and furniture.

121. LIFE DRAWING I. Junior year, second semester. Studio, six hours. Two semester credits. Prerequisite: Water Color I (Arch. 118). Mr. Helm.

This consists of drawing from the living model in charcoal. Full-length antique is also drawn. Laboratory deposit, $5.

123. LIFE DRAWING II. Senior year, second semester. Studio, six hours. Two semester credits. Prerequisite: Life Drawing I (Arch. 121). Mr. Helm.

This course is a continuation of Life Drawing I. Laboratory deposit, $5.

126. PERSPECTIVE. Freshman year, second semester. Drafting room, three hours. One semester credit. Prerequisites: Elements of Architecture I (Arch. 106A) and Engineering Drawing (Mach. Design 101). Mr. Wichers.

Drafting-room exercises and examinations are given covering 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.

130. SHADES AND SHADOWS. Freshman year, first semester. Drafting room, three hours. One semester credit. Prerequisite: Must be taken with or follow Elements of Architecture 1 (Arch. 106A) and Engineering Drawing (Mach. Design 101). Assistant Professor Cheek.

A series of prepared problems applying the principles of descriptive geometry in casting conventional shadows constitute the scope of this course. 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. Laboratory charge, $1.

133. CLAY MODELING. Junior year, first semester. Studio, six hours. Two semester credits. Prerequisite: Still Life Drawing (Arch. 117). Professor Weigel.

This course is designed primarily to acquaint the student with the sculptor's art. Clay models, plaster molds, and finished plaster casts of simple decorative fragments and anatomical forms are made. Relief maps are constructed from data obtained from actual survey.

142. DESIGN I. Sophomore year, first semester. Drafting room, nine hours. Three semester credits. Prerequisites: Elements of Architecture II (Arch. 107A), Free-hand Drawing II (Arch. 114), and simultaneously with Shades and Shadows (Arch. 130). Professor Weigel and Associate Professor Kleinschmidt.

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 student's work before the entire class.

144. DESIGN II. Sophomore year, second semester. Drafting room, nine hours. Three semester credits. Prerequisite: Design I (Arch. 142). Professor Weigel and Associate Professor Kleinschmidt.

In this course Design I is continued.

145. DESIGN III. Junior year, first semester. Drafting room, fifteen hours. Five semester credits. Prerequisites: Still-life Drawing (Arch. 117) and Design II (Arch. 144). Associate Professor Kleinschmidt.

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: Design III (Arch. 145). Associate Professor Kleinschmidt.

In this course Design III is continued.

148. DESIGN V. Senior year, first semester. Drafting room, twenty-four hours. Eight semester credits. Prerequisites: Water Color I (Arch. 118) and Design IV (Arch 147). Associate Professor Kleinschmidt.

In this course Design IV is continued. An option is given those who wish to specialize in interior design and decoration.

151. DESIGN VI. Senior year, second semester. Drafting room, twenty-four hours. Eight semester credits. Prerequisite: Design V (Arch. 148). Associate Professor Kleinschmidt.

The work in Design V, including that in interior design and decoration if previously elected, is continued.

154A. HISTORY OF ARCHITECTURE I. Freshman year, first semester. Lectures, two hours. Two semester credits. 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.

157A. HISTORY OF ARCHITECTURE II. Freshman year, second semester. Lectures, two hours. Two semester credits. Prerequisite: History of Architecture I (Arch. 154A). Professor Weigel.

This course continues History of Architecture I.

158A. HISTORY OF ARCHITECTURE III. Sophomore year, first semester. Lectures, two hours. Two semester credits. Prerequisites: Free-hand Drawing (Arch. 114) and History of Architecture II (Arch. 157A). Assistant Professor Kleinschmidt.

This course continues History of Architecture II.

160A. HISTORY OF ARCHITECTURE IV. Sophomore year, second semester. Lectures, two hours. Two semester credits. Prerequisite: History of Architecture III (Arch. 158A). Associate Professor Kleinschmidt.

This course continues History of Architecture III and finishes the History of Architecture to modern times.

165. COMMERCIAL ILLUSTRATION I. Elective, first semester. Studio, six hours. Two semester credits. Elective for Industrial Journalism students and students in the Division of General Science. Mr. Helm.

This course is intended for those who wish to enter the field of commercial art. The principles of advertising arrangements are studied and various types of advertising designs are made. These include newspaper advertisements, street-car cards, lettering and posters. Cover designs are made for magazines, books and trade catalogues, also for headings, tailpieces and decorative page arrangements. Drawings are carried out in black and white and in one or more colors, careful consideration being given to the practical nature of the design.

170. COMMERCIAL ILLUSTRATION II. Elective, second semester. Studio, six hours. Two semester credits. Prerequisite: Commercial Illustration I (Arch. 165) or Design (Applied Art 101). Mr. Helm.

This course is a continuation of Arch. 165. The more advanced problems are studied here.

178. HISTORY OF CIVILIZATION AND ART I. Senior year, first semester. Lectures, three hours. Two semester credits. Prerequisite: History of Architecture IV (Arch. 160A). Professor Weigel.

This course comprises a survey of civilization from earliest history, laying special emphasis on the Hellenic and Roman periods; 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.

182. HISTORY OF CIVILIZATION AND ART II. Senior year, second semester. Lectures, three hours. Two semester credits. Prerequisite: History of Civilization and Art I (Arch. 178). Professor Weigel.

In this course History of Civilization and Art I is continued to the close of the Renaissance.

187A. BUILDING MATERIALS AND CONSTRUCTION. Sophomore year, first semester. Lectures, three hours. Three semester credits. Prerequisite: Elements of Architecture II (Arch. 107A). Assistant Professor Cheek.

The student is introduced to the properties and uses of the materials of construction. Attention is also given to the properties of these materials in their relation to design. 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. Subjects are periodically assigned for papers and discussions which require use of the reference library.

191. WORKING DRAWINGS AND SPECIFICATIONS. Sophomore year, second semester. Drafting room, nine hours. Three semester credits. Prerequisite: Building Materials and Construction (Arch. 187A) and Design I (Arch. 142). Professor Weigel.

The course comprises the preparing of working drawings and specifications for suburban residences. The complete details for buildings are drawn. Heating, plumbing and structural problems are also worked out in connection with the course. It is attempted in this course to meet problems very much as they are met with by the architect in the profession.

192. THEORY OF STRUCTURES I. Senior year, first semester. Class work, two hours; drafting room, six hours. Four semester credits. Prerequisite: Working Drawings and Specifications (Arch. 191). Must be taken simultaneously with or subsequent to Applied Mechanics (201) or Applied Mechanics A (Ap. Mech. 102). Assistant Professor Cheek.

This course covers the simple principles of the design of framed structures under static loads. Emphasis is placed upon the action of forces, moments, reactions, internal stresses, and the laws of equilibrium. Class work is devoted to the algebraic solution of beams and typical roof trusses by both the methods of joints and sections. Drafting-room work consists of the graphical solution of problems relating to simple forces, centers of gravity, moments, moments of inertia and the analysis of the stresses in the more common forms of roof trusses and mill bents under dead and wind loads.

194. THEORY OF STRUCTURES II. Senior year, second semester. Class work, one hour; drafting room, six hours. Three semester credits. Prerequisite: Theory of Structures 1 (Arch. 192). Must be taken simultaneously with or subsequent to Strength of Materials A (Ap. Mech. 116) or Strength of Materials (Ap. Mech. 211) and Strength of Materials A Laboratory (Ap. Mech. 121). Assistant Professor Cheek.

This is a continuation of Theory of Structures I. The actual design and detailing of members and their various connections for timber framing is begun, ending with the complete design and detailing of an individual problem by each member of the class.

196. STRUCTURAL DESIGN I. Elective, first semester. Class work, one hour; drafting room, six hours. Three semester credits. Prerequisite: Theory of Structures II (Arch. 194). Assistant Professor Cheek.

This course comprises design and detailing of a plate girder and steel roof truss and other problems in modern steel construction. The problems are assigned in practical form as met with in field conditions, and the student is required to calculate the loadings and conditions that determine the stresses in his particular case. Emphasis is placed upon the manner of making his notes and of detailing and tracing his finished design.

198. STRUCTURAL DESIGN II. Elective, second semester. Class work, one hour; drafting room, six hours. Three semester credits. Prerequisite: Structural Design I (Arch 196). Assistant Professor Cheek.

This is a continuation of Structural Design I (Arch. 196.) The elements and simpler design of reinforced concrete are taken up specifically.

FOR GRADUATES AND UNDERGRADUATES

201. ADVANCED FREE-HAND DRAWING I. Elective, first semester. Drafting room, six hours. Two semester credits. Mr. Helm.

This course includes the study of the human figure and exercises in original composition of architectural ornament. Work is done in various mediums.

206. ADVANCED FREE-HAND DRAWING II. Elective, second semester. Drafting room, six hours. Two semester credits. Mr. Helm.

This is a continuation of Advanced Free-hand Drawing I.

211. ADVANCED HISTORY OF CIVILIZATION AND ART I. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: History of Civilization and Art II (Arch. 182). Professor Weigel.

This course comprises a detailed study of civilization from the Babylonian and Assyrian Empires to the fifteenth century, tracing the artistic developments of each epoch. Instruction is by means of lectures, recitations, written papers, and research.

216. ADVANCED HISTORY OF CIVILIZATION AND ART II. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Advanced History of Civilization and Art I (Arch. 211). Professor Weigel.

This is a continuation of Advanced History of Civilization and Art I.

221. PROBLEMS IN ARCHITECTURAL DEVELOPMENT. Elective, first and second semesters. Drafting-room and class work. Credit as determined by Professor Weigel.

This course comprises the study of historic problems in architectural development. Such work must be pursued under the direct supervision of some member of the departmental staff.

230. OIL PAINTING I. Elective, first semester. Studio, six hours. Two semester credits. Prerequisite: Water Color I (Arch 118) or by approval of instructor. Mr. Helm.

This is a course in the rudiments of painting in oil. A knowledge is acquired of the essential materials and a palette is selected. Sketches are made of simple objects and drapes.

235. OIL PAINTING II. Elective, second semester. Studio, six hours. Two semester credits. Prerequisite: Oil Painting I (Arch. 230). Mr. Helm.

This is a continuation of course 230. Larger still-life groups are painted. One-half of the semester is devoted to sketching out of doors.

244. GENERAL HISTORY OF ARCHITECTURE. Elective, first or second semester. Lectures, three hours. Three semester credits. Prerequisite: Object Drawing II (Arch. 114) or Design A (Ap. Art 106). Professor Weigel.

This is a lecture and recitation course intended for students not registered in architecture or landscape architecture. The historic architectural styles of the world are studied and analyzed. The lectures are given with the aid of illustrations and lantern slides. Written papers, with sketches, are required of each student.

249. CITY PLANNING. Senior year, second semester. Drafting room, nine hours. Three semester credits. Prerequisites: Design II (Arch. 144), Civic Art (Hort. 223), and Landscape Gardening II (Hort. 245). Professor Weigel.

A detailed study is made of city plans, including transportation and street systems, parks and recreation facilities, public buildings and civic centers, subdivisions of land, restrictions and zoning. Field trips, reference readings, reports and drafting are comprised in the course.

FOR GRADUATES

301. ADVANCED DESIGN I. Elective, first semester. Drafting room, thirty hours. Ten semester credits. Professor Weigel.

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 Weigel.

This is a continuation of Advanced Design I.

This course may furnish material for the master's thesis.

324. RESEARCH IN ARCHITECTURE. Elective, first and second semesters. Drafting-room or class work. Credit as determined by Professor Weigel and Graduate Council.

This course comprises the study of a research problem in architecture, determined by conferences between Professor Weigel and the student, and approved by the Graduate Council.

This course may furnish material for the master's thesis.

# Civil Engineering

Professor CONRAD
Professor FRAZIER
Associate Professor FURR
Assistant Professor WHITE
Instructor CRAWFORD
Instructor MORSE

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 a knowledge of civil engineering is a prerequisite.

The department owns equipment valued at $14,943.

## COURSES IN CIVIL ENGINEERING

FOR UNDERGRADUATES

102. SURVEYING I. Freshman year, both semesters and summer school. Field work, plotting, and supervised study, six hours. Two semester credits. Prerequisite or parallel: Plane Trigonometry (Math. 101). Assistant Professor White, Mr. Crawford and Mr. Morse.

This is a brief course in the use and care of engineers' surveying instruments. Text: Breed and Hosmer's *Surveying,* Vol. I. Laboratory charge, $1.

111. SURVEYING II. Freshman year, both semesters and summer school. Field work, plotting and supervised study, six hours. Two semester credits. Prerequisite: Surveying I (Civ. Engr. 102). Associate Professor Furr and Assistant Professor White.

The course is devoted to land and topographic surveying. Text: Breed and Hosmer's *Surveying,* Vol. I. Laboratory charge, $1.

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. 202) must be taken with this course or precede it. 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: Jacoby and Davis' *Foundations for Bridges and Buildings.*

125. CIVIL ENGINEERING DRAWING I. Sophomore year, second semester. Drafting room, six hours. Two semester credits. Prerequisite: Machine Drawing I (Mach. Design 111). Assistant Professor White.

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 II and Civil Engineering Drawing I (Civ. Engr. 111, 125). Professor Frazier.

This is a short course in the theory of railway engineering based on Wel-

lington'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 (Civ. Engr. 111). Associate 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 (Civ. Engr. 111). Associate 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 (Civ. Engr. 151, 155). Calculus I (Math. 205) must be taken with this course or precede it. Associate 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 (Civ. Engr. 151, 155). Associate 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 and summer school. Class work, two hours. Two semester credits. Hydraulics (Ap. Mech. 230 and 235) 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. 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. STRESSES IN FRAMED STRUCTURES. Senior year, first semester and summer school. Class work, four hours. Four semester credits. Prerequisite: Strength of Materials (Ap. Mech. 211). 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.

205. CIVIL ENGINEERING DRAWING II. Senior year, first semester and summer school. 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 (Civ. Engr. 151, 155). 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: Hosmer's *Geodesy.*

216. ASTRONOMY AND GEODESY LABORATORY. Senior year, first semester. Field work, six hours. Two semester credits. Prerequisite: Surveying III Laboratory (Civ. Engr. 155). 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. 230 and 235). Professor Frazier.

The course deals with the water supply for cities from the standpoint of consumption, collection, storage, distribution, and purification. Text: Turneaure and Russell's *Public Water Supplies.*

225. SEWERAGE. Senior year, first semester. Class work, two hours. Two semester credits. Prerequisite: Hydraulics (Ap. Mech. 230). 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 (Ap. Mech. 202). Associate 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 laboratory work in connection with this course, see Ap. Mech. 250.)

246. DESIGN OF FRAMED STRUCTURES. Senior year, second semester and summer school. Drawing, nine hours. Three semester credits. Prerequisite: Stresses in Framed Structures (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.

250. CONCRETE DESIGN RECITATION. Senior year, second semester. Class work, two hours. Two semester credits. Prerequisite: Strength of Materials (Ap. Mech. 211). 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. 211). 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.

256. REINFORCED CONCRETE ARCHES. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Concrete Design (Civ. Engr. 250, 255). 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.

260. RAILWAY ENGINEERING II RECITATION. Optional, senior year, second semester. Class work, two hours. Two semester credits. Prerequisite: Railway Engineering I (Civ. Engr. 145). 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). 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). Associate 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). Associate 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.

276. HIGHWAY ECONOMICS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Highway Engineering II (Civ. Engr. 270, 275). Associate Professor Furr.

A study of highway transport and construction problems as affected by recent findings of research agencies in this field. Text: Harger's *Rural Highway Pavements.*

280. DRAINAGE AND IRRIGATION II RECITATION. Optional, senior year, second semester. Class work, two hours. Two semester credits. Prerequisite: Drainage and Irrigation I (Civ. Engr. 161). 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 semester. Class work, three hours. Three semester credits. Prerequisite: Stresses in Framed Structures (Civ. Engr. 201). Professor Conrad.

A study of deflections; stresses in continuous, movable, cantilever, suspension, multiple intersection, and steel arch bridges; and secondary stresses.

316. RAILROAD TRANSPORTATION. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Railway Engineering I (Civ. Engr. 145). Professor Frazier.

A study of the function of the railway system; its relation to industrial development and its correlation with other methods of transportation.

# Electrical Engineering

Professor REID
Professor KLOEFFLER
Assistant Professor BRENNEMAN
Instructor KERCHNER
Instructor HUNT
Instructor WILSON
Instructor CHURCH

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 equipped with standard apparatus for all kinds of photometric measurements. Lamps, reflectors and luminaries covering almost every type used in practice are maintained for experimental purposes.

Equipment for the study of radiotelephony is also available.

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 stock of supplies for cleat, concealed knob and tube, conduit, and condulet construction afford students actual practice in wiring buildings by the commonly used methods.

The equipment belonging to the department is valued at $37,274.

## COURSES IN ELECTRICAL ENGINEERING

### FOR UNDERGRADUATES

160. ELECTRICAL ENGINEERING C RECITATION. Senior year, second semester. Recitations or lectures, two hours. Two semester credits. Prerequisite: Engineering Physics II (Physics 150). Mr. Church.

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. Church.

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*. Laboratory charge, $1.

170. ELECTRICAL MACHINERY AND CONSTRUCTION. Freshman year, both semesters and summer school. Laboratory work, six hours. Two semester credits. Professor Reid, Mr. Hunt and Mr. Wilson.

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*. Laboratory charge, $3.

195. THESIS. Elective, continuing through both semesters. First semester: three hours; one semester credit. Second semester: six hours; two semester credits. Professor Reid, Professor Kloeffler, Assistant Professor Brenneman, Mr. Kerchner, Mr. Hunt, Mr. Wilson and Mr. Church.

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

203. DIRECT-CURRENT MACHINES I RECITATION. Junior year, both semesters and summer school. Recitations or lectures, three hours. Three semester credits. Prerequisites: Calculus I (Math. 205) and Engineering Physics II (Physics 150). Assistant Professor Brenneman and Mr. Kerchner.

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*.

204. DIRECT-CURRENT MACHINES I LABORATORY. Junior year, both semesters and summer school. Laboratory work, three hours. One semester credit. This course should accompany or follow Direct-current Machines I Recitation. Assistant Professor Brenneman and Mr. Kerchner.

A series of experiments outlined which is designed to necessitate careful, accurate measurement. The student is obliged to make all electrical connections with 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.* Laboratory charge, $1.

206. DIRECT-CURRENT MACHINES II RECITATION. Junior year, both semesters and summer school. Lectures or recitations, two hours. Two semester credits. Prerequisites: Direct-current Machines I (Elec. Engr. 203) and Electrical Measurements (Elec. Engr. 227). Assistant Professor Brenneman and Mr. Kerchner.

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.*

207. DIRECT-CURRENT MACHINES II LABORATORY. Junior year, both semesters and summer school. Laboratory work, three hours. One semester credit. This course should accompany or follow Direct-current Machines II Recitation. Professor Kloeffler and Mr. Kerchner.

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.* Laboratory charge, $1.

209. ALTERNATING-CURRENT MACHINES I RECITATION. Junior year, second semester and summer school. Recitations or lectures, four hours. Four semester credits. Prerequisites: Calculus II (Math. 206) and Direct-current Machines I (Elec. Engr. 203, 204). Professor Reid and Mr. Kerchner.

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: Lawrence's *Principles of Alternating Currents.*

211. ALTERNATING-CURRENT MACHINES I LABORATORY. Junior year, second semester and summer school. Laboratory work, three hours. One semester credit. This course should accompany or follow Alternating-current Machines I Recitation. Professor Reid, Mr. Kerchner, Mr. Hunt, and Mr. Church.

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. Laboratory charge, $1.

213. ALTERNATING-CURRENT MACHINES II RECITATION. Senior year, first semester and summer school. Recitations or lectures, four hours. Four semester credits. Prerequisite: Alternating-current Machines I (Elec. Engr. 209, 211). Professor Reid and Mr. Kerchner.

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: Lawrence's *Principles of Alternating-current Machinery.*

215. ALTERNATING-CURRENT MACHINES II LABORATORY. Senior year, first semester and summer school: Laboratory work, six hours. Two semester credits. This course should accompany or follow Alternating-current Machines II Recitation. Professor Reid, Mr. Kerchner, Mr. Hunt and Mr. Church.

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. Laboratory charge, $1.50.

220. TELEPHONY RECITATION. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: Alternating-current Machines I (Elec. Engr. 209, 211). Professor Kloeffler.

This course covers the principles of telephonic communication as applied to the apparatus and circuits used on magneto, common battery (manual), Strowger automatic and machine switching systems. Toll telephone practice, involving the use of line loading, repeaters and carrier currents is likewise included. Text: Kloeffler's *Telephone Communication Systems.*

225. TELEPHONE LABORATORY. Elective, first semester. Laboratory, three hours. One semester credit. This course should accompany or follow Telephony Recitation. 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. Laboratory charge, $1.

227. ELECTRICAL MEASUREMENTS RECITATION. Junior year, first semester and summer school. Lectures and recitations, two hours. Two semester credits. Prerequisites: Calculus I (Math. 205) and Engineering Physics II (Physics 150). 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.*

The latter part of the course is devoted to a study of construction and testing of the various types of voltmeters, ammeters, wattmeters, and watthour meters. Text: Jansky's *Electrical Meters.*

228. ELECTRICAL MEASUREMENTS LABORATORY. Junior year, first semester and summer school. Laboratory work, three hours. One semester credit. This course should accompany or follow Electrical Measurements Recitation. Professor Kloeffler.

The laboratory course follows the work of the classroom by giving applications of the fundamental principles studied. Laboratory charge, $1.

230. 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. 205). 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.*

231. 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. Laboratory charge, $1.

235. ILLUMINATING ENGINEERING RECITATION. Elective, second semester. Lectures and recitation, two hours. Two semester credits. Prerequisites: Calculus II (Math. 206) and Engineering Physics II (Physics 150). Professor Kloeffler.

This course is devoted to a study of photometry, light standards, the principles of illumination, and illumination design. Texts: Ferguson's *Electric Lighting,* and bulletins of the National Lamp Works.

236. ILLUMINATING ENGINEERING LABORATORY. Elective, second semester. Laboratory, three hours. One semester credit. This course should accompany or follow Illuminating Engineering Recitation. Professor Kloeffler.

The laboratory work involves photometric measurements of light intensity, luminous flux, brightness and illumination, and the determination of light distribution about various illuminants and luminaries. Each student makes a lighting survey of some commercial establishment and works out a practical illumination design problem as a part of the course. Laboratory charge, $1.

240. ELECTRIC RAILWAYS. Elective, second semester. Recitations or lectures, two hours. Two semester credits. Prerequisite: Alternating-current Machines II (Elec. Engr. 213, 215.) Professor Reid and Mr. Kerchner.

A study is made of the development of electric traction; traffic conditions

and train schedules; speedtime curves; power generation and distribution for electric railway 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.*

242. ELECTRICAL ENGINEERING M-II RECITATION. Senior year, second semester. Lectures and recitations, three hours. Three semester credits. Prerequisite: Electrical Engineering M-I (Elec. Engr. 230, 231). 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.*

243. ELECTRICAL ENGINEERING M-II LABORATORY. Senior year, second semester. Laboratory work, three hours. One semester credit. Assistant Professor Brenneman and Mr. Hunt.

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. Laboratory charge, $1.

245. STORAGE BATTERY ENGINEERING. Elective, first semester. Class work, three hours. Three semester credits. Prerequisites: Chemistry E-II (Chem. 108), and Engineering Physics II (Physics 150). 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, second semester. Class work, two hours. Two semester credits. Prerequisite: Economics (Econ. 101). 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 semester. Class work, two hours. Two semester credits. Prerequisite: Direct-current Machines I (Elec. Engr. 203). 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 (Elec. Engr. 242). 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.

270. ELECTRICAL MACHINE DESIGN I. Senior year, first semester. Laboratory work, three hours. One semester credit. Prerequisite: Direct-current Machines II (Elec. Engr. 206, 207). 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.*

271. ELECTRICAL MACHINE DESIGN II. Elective, second semester. Laboratory, six hours. Two semester credits. Prerequisites: Alternating-current Machines II (Elec. Engr. 213, 215) and Electrical Machine Design I (Elec. Engr. 270). 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.

275. SYMBOLIC NOTATION IN ELECTRICITY. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Alternating-current Machines II (Elec. Engr. 213). Assistant Professor Brenneman and Mr. Kerchner.

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.

280. GENERATION, TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Alternating-current Machines II (Elec. Engr. 213). Assistant Professor Brenneman.

This course is designed to cover selection of equipment for powerhouses 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.

FOR GRADUATES

316. TRANSIENT ELECTRICAL PHENOMENA. Elective, second semester. Class work, three hours. Three semester credits. Prerequisites: Symbolic Notation in Electricity (Elec. Engr. 275), and Differential Equations (Math. 201). 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 non-magnetic conductors; rate of flux penetration. Text: Steinmetz's *Transient Electrical Phenomena.*

321. ADVANCED TELEPHONY. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Telephony (Elec. Engr. 220). 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, second semester. Class work, two hours. Two semester credits. Prerequisite: Illuminating Engineering (Elec. Engr. 235). 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.

336. ELECTRICAL ENGINEERING RESEARCH. Elective, first or second semester. One semester credit for each three hours laboratory. Prerequisite: Alternating-current Machines II (Elec. Engr. 213). Professor Reid, Professor Kloeffler and Assistant Professor Brenneman.

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.

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## 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 engineering; the Kansas State Agricultural College Civil Engineering Society conducts the seminar for students in civil engineering; the Architects' Club has charge of the seminar for students in architecture, landscape architecture and architectural engineering; the student branch of the American Society of Agricultural Engineers conducts the seminar for the students in agricultural engineering; special seminars are held for students in chemical engineering and flour mill 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.

# Machine Design

Professor PEARCE
Assistant Professor SMUTZ
Assistant Professor DURLAND
Instructor HUNT
Instructor GINGRICH
Instructor HAFFORD

The courses in engineering drawing and machine drawing deal principally with the training of the freshman and sophomore students in visualization, and the application of graphical language to engineering problems, with particular reference to commercial drafting-room methods. The object of these courses is primarily to develop this graphical language as a tool to be used in all future engineering work.

The courses in machine design deal with the mechanical transmission of power, the analysis of the action of machine parts, and the design of machine elements and of complete machines with regard to strengh, stiffness and general operating efficiency. In this group may be included also the course in flour-mill design, which deals with the layout of flow sheets and the selection and arrangement of milling machinery.

The department owns equipment valued at $8,869.

## COURSES IN DRAWING AND MACHINE DESIGN

FOR UNDERGRADUATES

101. ENGINEERING DRAWING. Freshman year, both semester and summer school. Drafting, supplemented by lectures and recitations, six hours. Two semester credits. Assistant Professor Smutz, Mr. Hunt, and Mr. Gingrich.

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,* and French and Turnbull's *Lessons in Lettering, Book II.*

106. DESCRIPTIVE GEOMETRY. Freshman year, both semesters and summer school. Drafting practice with lectures and recitations, six hours. Two semester credits. Prerequisites: Engineering Drawing (Mach. Design 101) and Solid Geometry. Assistant Professor Smutz, Mr. Hunt, and Mr. Gingrich.

This course, which is a continuation of Engineering Drawing, takes 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 plane, as well as the practical applications of the principles involved. Emphasis is laid on developing the student's ability to visualize drawings in the third angle. Text: *Descriptive Geometry* by Cutter.

111. MACHINE DRAWING I. Sophomore year, both semesters and summer school. Drafting, with lectures and recitations, six hours. Two semester credits. Prerequisite: Descriptive Geometry (Mach. Design 106). Professor Pearce, Assistant Professor Durland, Mr. Hunt, and Mr. Hafford.

A study is made of conventional representations, working drawings, modern drafting-room systems, and the reproduction of drawings. Additional practice is given 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.*

116. MACHINE DRAWING II. Sophomore and junior years, second semester and summer school. Drafting, nine hours. Three semester credits. Prerequisites: Machine Drawing I (Mach. Design 111), Mechanism (Mach. Design 121) must accompany or precede this course. Professor Pearce, Mr. Hunt, and Mr. Hafford.

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.

121. 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 (Mach. Design 106). Professor Pearce, Assistant Professor Durland and Mr. Hunt.

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.*

126. THESIS. Senior year, continuing through the year. First semester: laboratory, three hours; one semester credit. Second semester: laboratory. six hours; two semester credits. Professor Pearce.

Projects in machine design or flour-mill design furnish excellent material for thesis study. 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

202. MACHINE DESIGN I. Junior year, second semester. Drafting, three hours. One semester credit. Prerequisite: Machine Drawing II (Mach. Design 116) and Steam and Gas Engineering I (Mech. Engr. 101). Assistant Professor Durland.

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.

204. MACHINE DESIGN II RECITATION. Senior year, first semester. Lectures and recitations, three hours. Three semester credits. Prerequisites: Strength of Materials (Ap. Mech. 211); Machine Drawing II (Mach. Design 116); Steam and Gas Engineering II (Mech. Engr. 110). Must accompany Machine Design II Laboratory (Mach. Design 205). 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 (Mach. Design 204). 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 (Mach. Design 204, 205). Professor Pearce.

This is a continuation of Machine Design II Laboratory. A small power shear is designed. Calculations are made for all parts, and a graphical analysis is made of the stress 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. 215) and Milling Practice I (Mill. Ind. 109). Professor Pearce.

A design is made for a medium capacity flour mill, including the selection and planning of the arrangement of the machinery.

220. MECHANISM G. Elective, first semester. Lectures and recitations, three hours. Three semester credits. Prerequisites: Plane Trigonometry (Math. 101), Engineering physics II (Physics 150), and Descriptive Geometry (Mach. Design 106). Professor Pearce and Assistant Professor Durland.

This course is similar to Mechanism (Mach. Design 121), but somewhat more advanced. In addition to the subjects discussed in the latter course, attention is given to the pressure angles in cams, multiple speed drives for machine tools, epicyclic trains, and graphical analysis of motions in linkages. Considerable library reference work is required. Text: Schwamb and Merrill's *Elements of Mechanics*.

225. GRAPHICS OF ENGINEERING FORMULAS. Elective, second semester. Lectures and recitations, two hours. Two semester credits. Prerequisite: Plane Analytical Geometry (Math. 110). Professor Pearce.

This course is intended to satisfy the needs of two classes of technical workers: (1) Those who wish to find equations to satisfy experimental data; and (2) those who wish to plot known formulas so that the latter can be solved graphically. The first section deals with the design of empirical equations according to the methods of selected points, averages, or least squares, and a consideration of general methods of plotting. The second section deals with the diagramming of formulas so that a solution may be read directly without computation. A particular study is made of the construction of nomagraphic or alignment charts, in which all the variables of a formula will be along any straight transversal cutting the lines of the diagram. Text: *Design of Diagrams for Engineering Formulas*, by Hewes and Seward.

FOR GRADUATES

355. ADVANCED MACHINE DESIGN. Elective, first or second semester. One semester credit for each three hours of drafting-room work. Professor Pearce.

At the option of the student, this course may include a study of the advanced dynamics of machinery, with special reference to the inertia effects, torque characteristics, flywheel design, and balancing of multiple cylinder engines and compressors, the design of turbine drums and disks, the critical speed of rotating parts, and gyroscopic action.

This course may furnish material for the master's thesis.

# Mechanical Engineering

Professor CALDERWOOD
Associate Professor MACK
Instructor WILLIS
Instructor BRAINARD

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.

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.

The equipment belonging to this department is valued at $22,366.

## 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 (Mach. Design 121) and Calculus II (Math. 206). Professor Calderwood and Associate Professor Mack.

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. Mr. Willis and Mr. Brainard.

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. Laboratory charge, $1.

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 (Mech. Engr. 101). Professor Calderwood and Associate Professor Mack.

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. Mr. Willis and Mr. Brainard.

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. Laboratory charge, $1.

120. STEAM AND GAS ENGINEERING C RECITATION. Junior and senior years, second semester. Lectures and recitations, two hours. Two semester credits. Prerequisites: Engineering Physics II (Physics 150) and Calculus II (Math. 206). Mr. Willis.

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. Mr. Willis and Mr. Brainard.

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. Laboratory charge, $1.

130. ELEMENTS OF STEAM AND GAS POWER. Freshman year, both semesters. Lectures, recitations, and laboratory, six hours. Two semester credits. Professor Calderwood, Mr. Willis and Mr. Brainard.

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*. Laboratory charge, $1.

170. DAIRY REFRIGERATION RECITATION. Elective, first semester. Lectures and recitations, one hour. One semester credit. Mr. Willis.

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. Willis.

Various types of refrigeration systems and their operation are studied; steam-engine operation is studied, and refrigeration machines are tested. Laboratory charge, $1.

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 and Associate Professor Mack.

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 (Mech. Engr. 110). Professor Calderwood, Associate Professor Mack and Mr. Brainard.

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. Laboratory charge, $2.

210. REFRIGERATION, HEATING, AND VENTILATION RECITATION. Senior year, second semester. Lectures and recitations, two hours. Two semester credits.

Prerequisite: Steam and Gas Engineering II (Mech. Engr. 110). 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 Associate Professor Mack.

The laboratory work includes tests of refrigerating machinery and of the thermal conductivity of insulating materials; tests of 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. Laboratory charge, $1.

220. AERODYNAMICS RECITATION. Elective, senior year, second semester. Lectures and recitations, two hours. Two semester credits. Prerequisite: Steam and Gas Engineering II (Mech. Engr. 110). 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 Associate 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. Laboratory charge, $1.

230. ADVANCED THERMODYNAMICS. Elective, first semester. Lectures and recitations, two hours. Two semester credits. Prerequisite: Steam and Gas Engineering I (Mech. Engr. 101). 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.

235. STEAM TURBINES. Elective, second semester. Lectures and recitations, two hours. Two semester credits. Prerequisite: Power Plant Engineering (Mech. Engr. 206). 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.

FOR GRADUATES

305. ENGINEERING RESEARCH. Elective, first or second semester. One semester credit for each three hours of laboratory work. Professor Calderwood and Associate 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.

# Shop Practice

Professor CARLSON
Associate Professor SELLERS
Assistant Professor JONES
Assistant Professor LYNCH
Assistant Professor FLAGG
Assistant Professor GRAHAM
Instructor GRANT
Instructor AIMAN
Instructor COOL
Instructor PINKERTON
Instructor GRANELL
Assistant GREELEY
Assistant IRWIN

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-eight 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.

A locker room of ample capacity is conveniently located near the shops building for the use of students taking work in the department.

The value of equipment belonging to this department is $48,628.

## 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 and Mr. Irwin.

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 forestry conditions, wastage in the woodworking industries, the structural growth of wood and the kiln drying of lumber. Laboratory charge, $1.75.

103. ENGINEERING WOODWORK II. Elective, both semesters. Laboratory, three hours. One semester credit. Prerequisite: Engineering Woodwork I (Shop 101). Mr. Aiman.

This course is a continuation of Engineering Woodwork I, giving special attention to commercial methods. The effect of heat, humidity, evaporation, circulation, and the piling of lumber in the operation of drykilns is given special treatment. The routing of material through a woodworking factory, the selection of woodworking machinery and its location, labor-saving devices and other important features are studied. Laboratory charge, $1.75.

117. MANUAL TRAINING FOR PRIMARY GRADES. Elective, summer school. Laboratory, six hours. Two semester credits. Mr. Aiman.

This course is planned to meet the needs of teachers of primary work. Exercises suitable for the various grades are studied, and a short time is devoted to the selection of suitable materials and equipment. The work includes paper

cutting, cardboard construction, raffia, cord work, weaving, reed work, and elementary tool work in woodworking. Laboratory charge, $3.50.

120. WOODWORKING FOR GRAMMAR GRADES. Elective, first semester and summer school. Laboratory, six hours. Two semester credits. Prerequisite: None. Mr. Aiman, and Mr. Cool.

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. Laboratory charge, $3.50.

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. Cool.

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. Laboratory charge, $3.50.

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. Cool.

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. Laboratory charge, $3.50.

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. Irwin.

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. Laboratory charge, $3.50.

140. ADVANCED WOODWORK. Elective, both semesters and summer school. Laboratory, six hours. Two semester credits. Prerequisite: Woodworking II for High Schools (Shop 130). Mr. Aiman and Mr. Cool.

This course is a continuation of Woodworking II for High Schools and gives an opportunity to specialize in wood finishing, cabinet work, or some other work of special interest to the student. Laboratory charge, $3.50.

145. PATTERN MAKING. Junior and senior years, both semesters. Laboratory, three hours. One semester credit. Prerequisite: Engineering Woodwork I (Shop 101). Mr. Aiman.

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 of machine parts are made. Laboratory charge, $1.75.

147. FARM CARPENTRY I. Elective, first semester and summer school. Lectures and recitations, one hour; laboratory, six hours. Three semester credits. Assistant Professor Graham.

This course is designed for the training of teachers who must solve problems in connection with carpentry work on the farm. It consists of rafter cutting and erection, studding and siding work, making window and door frames, hanging doors, and similar operations on full-size construction work. A bill of material will be made before each exercise is started. Instruction is also given in saw filing, tool sharpening and the general care and upkeep of tools. Laboratory charge, $3.50.

148. FARM CARPENTRY II. Elective, second semester and summer school. Laboratory, six hours. Two semester credits. Prerequisite: Farm Carpentry I (Shop 147). Assistant Professor Graham.

This course is a continuation of Farm Carpentry I. It consists of work on projects that will be most useful to those who are preparing to teach in rural communities. Laboratory charge, $3.50.

150. FORGING I. Freshman year, both semesters and summer school. Laboratory, three hours. One semester credit. Prerequisite: None. Assistant Professor Lynch and assistants.

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 a ball pein hammer weighing with handle about two pounds. Laboratory charge, $4.

157. FARM BLACKSMITHING I. Elective, first semester and summer school. Laboratory, three hours. One semester credit. Assistant Professors Lynch and Graham.

The preliminary work of this course is the same as Forging I (Shop 150). The exercises are closely related to the work of the farm. The course is designed to train teachers for service in rural communities. Laboratory charge, $4.

158. FARM BLACKSMITHING II. Elective, second semester and summer school. Laboratory, three hours. One semester credit. Prerequisite: Farm Blacksmithing I (Shop 157). Assistant Professors Lynch and Graham.

This course is a continuation of Farm Blacksmithing I. It covers more advanced instruction in the working of iron and steel, and in the annealing, hardening and tempering of tools useful to the farmer. Laboratory charge, $4.

160. FOUNDRY PRACTICE. Sophomore year, both semesters and summer school. 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. Laboratory charge, $1.

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. Associate 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.

167. METALLOGRAPHY. Sophomore year, both semesters. Laboratory, three hours. One semester credit. Prerequisites: Forging I (Shop 150) and Metallurgy (Shop 165); may be taken simultaneously with Metallurgy. Professor Carlson and Associate Professor Sellers.

A study is made of the microscopic constituents of the different grades of iron, steel, and the more common nonferrous alloys. The changes in the structure and properties of the metals as produced by heat treatment, mechanical working and composition are also studied. Laboratory charge, $4.

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, and Mr. Pinkerton.

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. Text: Smith's *Advanced Machine Work*. Laboratory charge, $6.

175. FARM SHOP METHODS. Elective, first semester and summer school. Lectures and recitations, one hour; laboratory, six hours. Three semester credits. Prerequisites: Farm Carpentry II (Shop 148), Farm Blacksmithing II (Shop 158) and Farm Equipment (Agr. Engr. 120, 121). Assistant Professor Graham.

This course is designed to train teachers in farm shop work. It includes babbitting, soldering, drilling and drill grinding, thread cutting with dies and taps, tool sharpening, belt lacing, repair of machinery, and other practical operations. Laboratory charge, $3.50.

180. ADVANCED PATTERN MAKING. Elective, both semesters. Laboratory, three hours. One semester credit. Prerequisite: Pattern Making (Shop 145). Professor Carlson and Mr. Aiman.

This is a continuation of Pattern Making, with more advanced work, including match-board work, patterns for molding machines, and general pattern work. Laboratory charge, $1.75.

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. Laboratory charge, $1.

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 and Mr. Pinkerton.

Progressive problems are given in turning and calipering, in boring, in reaming and taper turning and in threading on the lathe with exercise 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 and text required: same as for Machine Tool Work I. Laboratory charge, $6.

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 Jones and Mr. Pinkerton.

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. Laboratory charge, $3.

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 Associate 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.

FOR GRADUATES AND UNDERGRADUATES

235. MACHINE TOOL WORK IV. Elective, both semesters. Laboratory, three hours. One semester credit. Prerequisite: Machine Tool Work III (Shop 193). Professor Carlson and Assistant Professor 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. Laboratory charge, $3.

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. 211). Professor Carlson.

This course deals with 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. One semester credit for each three hours of laboratory. 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. Laboratory charge, $3.

265. SHOP-PRACTICE RESEARCH. Elective, both semesters. One semester credit for each three hours of laboratory. Professor Carlson and Associate 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.

270, 275. AUTOMOTIVE ENGINEERING. Elective, second semester. Lectures and recitations, one hour; laboratory, three hours. Two semester credits. Prerequisites: Strength of Materials (Ap. Mech. 211, 220), Machine Design II (Mach. Design 204, 205). Professor Carlson and Assistant Professor Flagg.

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. Laboratory charge, $3.

## 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 enginering 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

MARGARET M. JUSTIN, *Dean*

Modern research in the sciences and present-day development of the industries, arts, and profession 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 housekeeper's 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. 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 report to the superintendent of the Hospital for a physical examination, and she 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 | | 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) |
| Applied Design I *or* Applied Design II | | Household Physics | |
| Ap. Art. 101 *or* 106 | 3(1-6) | Physics 101 | 4(3-3) |
| Foods I* | | Clothing I* | |
| Food and Nut. 101 | 3(1-6) | Clo. and Text. 101 | 2(1-3) |
| Elem. Hygiene and Home Nursing | | House Furnishings | |
| Hshld. Econ. 103 | 3(2-3) | Ap. Art. 108 | 2(1-3) |
| Library Methods | | Costume Design I | |
| Lib. Ec. 101 | 1(1-0) | Clo. and Text. 106 | 2(0-6) |
| Current History | | Physical Education W-II | |
| Hist. 126 | 1(1-0) | Phys. Ed. 152A | 1(0-3) |
| Physical Education W-I | | | |
| Phys. Ed. 151A | 1(0-3) | | |

* Students should not select Clothing I and Foods I if Domestic Art and Domestic Science have been pursued in high school.

### SOPHOMORE

| First Semester | | Second Semester | |
|---|---|---|---|
| Organic Chemistry HE Chem. 121 | 5(3-6) | Foods II Food and Nut. 106 | 5(3-6) |
| English Literature Engl. 172 | 3(3-0) | American Literature Engl. 175 | 3(3-0) |
| General Zoölogy Zoöl. 105 | 5(3-6) | Embryology and Physiology Zoöl. 201 | 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. 107 | 3(2-3) |
| 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 | 5( - ) |

### SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| German Readings Mod. Lang. 111 | 3(3-0) *or* | American Government Hist. 151, 152 *or* 153 | 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( - ) | | |

## Curriculum in Home Economics and Nursing

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 (Vet.) Chem. 105 | 5(3-6) | Organic Chemistry (Vet.) Chem. 106 | 5(3-6) |
| Library Methods Lib. Ec. 101 | 1(1-0) | General Zoölogy Zoöl. 105 | 5(3-6) |
| German I Mod. Lang. 101 | 3(3-0) | German II Mod. Lang. 102 | 3(3-0) |
| Psychology C Educ. 103 | 3(3-0) | Physical Education W-II Phys. Ed. 152A | 1(0-3) |
| Physical Education W-I Phys Ed. 151A | 1(0-3) | | |

† Students in the Division of Home Economics take a minimum of nine hours of French or German unless they have had previously one or more years high-school work in the language in question. In case French or German has been taken previously in high school only two more advanced courses of that language are required. 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.

## SOPHOMORE

| First Semester | | Second Semester | |
|---|---|---|---|
| Foods II<br>Food and Nut. 106 | 5(3-6) | Physiological Chemistry<br>Chem. 231 | 5(3-6) |
| Embryology and Physiology<br>Zoöl. 201 | 5(3-6) | Household Physics<br>Physics 101 | 4(3-3) |
| General Microbiology<br>Bact. 101 | 3(1-6) | Current History<br>Hist. 126 | 1(1-0) |
| American History I<br>Hist. 101 | 3(3-0) | American Government<br>Hist. 151, 152, *or* 153 | 3(3-0) |
| | | English Literature<br>Engl. 172 | 3(3-0) |
| Physical Education W-III<br>Phys. Ed. 153 | 1(0-3) | Physical Education W-IV<br>Phys. Ed. 154 | 1(0-3) |

## JUNIOR

(Replaced by two years at Charlotte Swift Hospital)

Theoretical and practical work during the time includes:

| First Year | Second Year |
|---|---|
| History and Ethics of Nursing | Surgery and Surgical Nursing and Bandaging |
| Hospital Economics | Obstetrics and Gynecology |
| Personal Hygiene | Pediatrics |
| Nursing Methods | Diseases of Eye, Ear, Nose and Throat |
| Anatomy | Nervous and Mental Diseases |
| Medical Nursing | Materia Medica |
| Communicable Diseases | Problems in Nursing |
| Special Therapeutics and Massage | |
| Human Nutrition<br>Food and Nut. 112 3(3-0)<br>(To be taken at College) | |

## SENIOR

| First Semester | Second Semester | |
|---|---|---|
| (Specialized work in affiliated hospitals) | Dietetics<br>Food and Nut. 201 | 5(3-6) |
| | American Literature<br>Engl. 175 | 3(3-0) |
| | Sociology<br>Econ. 151 | 3(3-0) |
| | Elective | 6( - ) |

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# 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.

### Advertising, Buying and Salesmanship

| First Semester | | Second Semester | |
|---|---|---|---|
| Applied Design II<br>Ap. Art. 106 | 3(1-6) | Principles of Advertising<br>Ind. Jour. 179 | 3(3-0) |
| Clothing Salesmanship<br>Clo. and Text. 130 | 2(2-0) | Written and Oral Salesmanship<br>Engl. 123 | 3(3-0) |
| Commercial Correspondence<br>Engl. 122 | 3(3-0) | Applied Psychology<br>Educ. 215 | 2(2-0) |
| Oral English<br>Engl. 128 | 3(3-0) | Accounting Practice I<br>Math. 140A | 3(2-3) |
| Industrial Feature Writing I<br>Ind. Jour. 167 | 2(2-0) | Business Management<br>Econ. 126 | 2(2-0) |
| Technical Writing<br>Engl. 207 | 2(2-0) | | |

## Certificate Requirements for Vocational Home Economics Teaching

| First Semester | | Second Semester | |
|---|---|---|---|
| Educational Administration A *or* B Educ. 105 *or* 106 | 3(3-0) | Educational Psychology Educ. 109 | 3(3-0) |
| Special Methods in Teaching of Home Economics Educ. 132 | 3(3-0) | Supervised Teaching in Home Economics Educ. 160 | 3( - ) |
| Child Welfare Hshld. Econ. 203 | 3(3-0) | Practice Course in Household Management Hshld. Econ. 116 | 3( - ) |
| Vocational Education A Educ. 125 | 3(3-0) | Electives | 5( - ) |

## Clothing and Textile Work

| First Semester | | Second Semester | |
|---|---|---|---|
| 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. 233 | 2(2-0) |
| Clothing Salesmanship Clo. and Text. 130 | 2(2-0) | Clothing Economics Clo. and Text. 237 | 2(2-0) |
| 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

| First Semester | | Second Semester | |
|---|---|---|---|
| Object Drawing I Arch. 111 | 2(0-6) | Object Drawing II Arch. 114 | 2(0-6) |
| Engineering Woodwork I Shop 105 | 1(0-3) | Engineering Woodwork II Shop 110 | 1(0-3) |
| Photography Physics 120 | 2(2-0) | 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 Typography I Ind. Jour. 101 | 3(2-3) | Principles of Typography II Ind. Jour. 104 | 3(2-3) |
| | | Handicraft Ap. Art. 112 | 2(0-6) |
| | | Interior Decoration and Furnishing Ap. Art 114 | 3(1-6) |

## Food and Nutrition

(Research; Hospital Dietetics; Public Health Work; Specialized Teaching)

| First Semester | | Second Semester | |
|---|---|---|---|
| Physical Chemistry Chem. 206 | 5(3-6) | Physiological Chemistry Chem. 231 | 5(3-6) |
| Microchemical Methods of Analysis Chem. 245 | 1(0-3) | Biochemical Preparations Chem. 234 | 5(0-15) |
| Anatomy and Physiology Anat. 131 | 3(2-3) | Quantitative Analysis Chem. 241 | 5(1-12) |
| Hygienic Bacteriology Bact. 206 | 4(2-6) | Food Analysis Chem. 257 | 3(0-9) |
| Problems in Food Economics and Nutrition I Food and Nut. 248 | 2 to 5 | Household Chemistry Chem. 265 | 3(1-6) |
| Food Economics and Nutrition Seminar I Food and Nut. 251 | 2(2-0) | Histology I Path. 101 | 3(1-6) |
| Field Work in Nutrition Food and Nut. 215 | 2 to 3 | Food Economics and Nutrition Seminar II Food and Nut. 252 | 2(2-0) |

## Home-making

| First Semester | | Second Semester | |
|---|---|---|---|
| Child Welfare Hshld. Econ. 203 | 3(3-0) | Interior Decoration and Furnishing Ap. Art 114 | 3(1-6) |
| Home Nursing Hshld. Econ. 109 | 1(0-3) | Principles of Art and their Application Ap. Art 124 | 3(3-0) |
| The Modern Family Hshld. Econ. 231 | 2(2-0) | Problems in Household Economics Hshld. Econ. 243 | 1 to 5 |
| Household Entomology Ent. 106 | 2(2-0) | Household Chemistry Chem. 265 | 3(1-6) |
| Sociology Econ. 151 | 3(3-0) | Rural Sociology Econ. 156 | 3(3-0) |
| Community Organization Econ. 267 | 3(3-0) | Clothing III Clo. and Text. 126 | 3(1-6) |

## Home-making

(Special Rural Problems)

| First Semester | | Second Semester | |
|---|---|---|---|
| Poultry Bacteriology Bact. 216 | 3(1-6) | Small Fruits Hort. 110 | 2(2-0) |
| Rural Sociology Econ. 156 | 3(3-0) | Market Gardening Hort. 210 | 3(2-3) |
| Home Nursing Hshld. Econ. 109 | 1(0-3) | Dairy Bacteriology Bact. 211 | 3(1-6) |
| Community Organization Econ. 267 | 3(3-0) | Apiculture Ent. 111 | 3(2-3) |
| | | Farm Sanitation and Water Supply Ag. Engr. 119 | 2(2-0) |

## Institutional Management

| First Semester | | Second Semester | |
|---|---|---|---|
| Institutional Management I Hshld. Econ. 221 | 3(1-6) | Institutional Management II Hshld. Econ. 226 | 4(3-3) |
| Commercial Correspondence Engl. 122 | 3(3-0) | Problems in Institutional Administration Hshld. Econ. 247 | 1 to 5 |
| Oral English Engl. 128 | 3(3-0) | Institutional Furnishings Ap. Art 116 | 3(1-6) |
| Business Management Econ. 126 | 2(2-0) | Institutional Accounting Math. 131 | 3(3-0) |
| Technical Writing Engl. 207 | 2(2-0) | Written and Oral Salesmanship Engl. 123 | 3(3-0) |
| | | Applied Psychology Educ. 215 | 2(2-0) |
| | | Labor Problems Econ. 233 | 2(2-0) |

## Lecturing and Demonstrating

| First Semester | | Second Semester | |
|---|---|---|---|
| Oral English Engl. 128 | 3(3-0) | Dramatic Reading Pub. Spk. 102 | 2(2-0) |
| Oral Interpretation Pub. Spk. 101 | 2(2-0) | Extempore Speech II Pub. Spk. 108 | 2(2-0) |
| Extempore Speech I Pub. Spk. 106 | 2(2-0) | Applied Psychology Educ. 215 | 2(2-0) |
| Sociology Econ. 151 | 3(3-0) | Rural Sociology Econ. 156 | 3(3-0) |
| Technical Writing Engl. 207 | 2(2-0) | Community Organization Econ. 267 | 3(3-0) |
| Practice in Food Demonstrations Food and Nut. 117 | 1(0-3) | | |

## Sanitary Science; Food and Market Inspection

| First Semester | | Second Semester | |
|---|---|---|---|
| Hygienic Bacteriology Bact. 206 | 4(2-6) | Dairy Chemistry Chem. 254 | 3(1-6) |
| Quantitative Analysis A Chem. 250 | 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

| First Semester | | Second Semester | |
|---|---|---|---|
| Child Welfare Hshld. Econ. 203 | 3(3-0) | Labor Problems Econ. 233 | 2(2-0) |
| Home Nursing Hshld. Econ. 109 | 1(0-3) | Rural Sociology Econ. 156 | 3(3-0) |
| The Modern Family Hshld. Econ. 231 | 2(2-0) | Social Problems Econ. 257 | 2(2-0) |
| Problems in Household Economics Hshld. Econ. 243 | 1 to 5 | Community Organization Econ. 267 | 3(3-0) |
| Sociology Econ. 151 | 3(3-0) | Modern Europe Hist. 223 | 3(3-0) |
| Latin America Hist. 207 | 2(2-0) | Immigration and International Relations Hist. 228 | 2(2-0) |
| Community Organization Econ. 267 | 3(3-0) | Problems in Child Welfare Hshld. Econ. 253 | 1 to 5 |
| Field Work in Nutrition Food and Nut. 215 | 2 to 3 | | |

## State Certificate Requirements for General Teaching

| First Semester | | Second Semester | |
|---|---|---|---|
| Educational Administration A *or* B Educ. 105 *or* 106 | 3(3-0) *or* | Educational Psychology Educ. 109 | 3(3-0) |
| School Management Educ. 107 | 3(3-0) | | |
| Additional Educational Courses | 9(9-0) | | |

(Note.—Special Methods in the Teaching of Home Economics (3 hrs.) and Supervised Observation and Teaching in Home Economics (3 hrs.) are recommended for 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
Instructor ARNOLD
Assistant HARRIS

Taste is cultivated through the impressions received in everyday surrounding 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.

This department owns equipment valued at $6,421.

## COURSES IN APPLIED ART

FOR UNDERGRADUATES

101. APPLIED DESIGN I. 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. Key deposit, 25 cents.

106. APPLIED DESIGN II. Sophomore year, first semester. Class work, one hour; studio, six hours. Three semester credits. Prerequisite: Applied Design I. 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. Key deposit, 25 cents.

108. HOUSE FURNISHINGS. Freshman year, second semester. Class work, one hour; studio, three hours. Two semester credits. Prerequisite: Applied Design I. 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. Key deposit, 25 cents.

112. HANDICRAFT. Elective, second semester. Studio, six hours. Two semester credits. Prerequisite: Applied Design II. 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. Key deposit, 25 cents.

114. INTERIOR DECORATION AND FURNISHING. Elective, second semester. Class work, one hour; studio, six hours. Three semester credits. Prerequisite: Applied Design I. 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. Key deposit, 25 cents.

116. INSTITUTIONAL FURNISHINGS. Elective, second semester. Class work, one hour; studio, six hours. Three semester credits. Prerequisite: Applied Design I. 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. Key deposit, 25 cents.

120. SKETCHING. Elective, second semester. Studio, six hours. Two semester credits. Prerequisite: Applied Design I. 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: Applied Design I. 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.

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## Clothing and Textiles

Professor GLANTON *
Professor BAKER
Associate Professor COWLES
Assistant Professor HINN
Instructor FECHT
Instructor CLARKE
Instructor 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.

The equipment belonging to this department is valued at $7,742.

### 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, Assistant Professor Hinn, Miss Fecht, and Miss Polson.

The aim of this course is to train for efficient technic in handling sewing equipment and materials. Adaptation and use of commercial patterns, kinds, qualities, and quantities of materials are discussed. Some attention is paid to the elementary facts which underlie the successful selection of textile fabrics.

*Laboratory.*—The planning and construction of garments from wash materials for various purposes are taken up in the laboratory. Key deposit, 25 cents.

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* Absent on leave, 1924-'25.

106. COSTUME DESIGN I. Freshman year, both semesters. Laboratory, six hours. Two semester credits. Prerequisite: Applied Design (Ap. Art 101) II. Miss Clarke 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 and junior standing. Miss Clarke.

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, both semesters. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: The ability to use patterns and to sew correctly without instructions. Associate Professor Cowles, Assistant Professor Hinn, and Miss Fecht.

The class work consists of consideration of bases for the selection of clothing; clothing as a financial investment; comparison of home- and factory-made garments; clothing budget in their relation to the rest of the income; clothing industries and clothing standards in their relations to the economic, social, and æsthetic life of the community. Emphasis is laid on principles of hygiene and sanitation as applied to clothing.

*Laboratory.*—The laboratory work consists of the planning of clothing budgets of individuals and of family groups as illustrated by the statistical family. Simple millinery problems are undertaken. Garments for children, men, and women are planned and constructed. Rapidity of construction and labor-saving methods are emphasized. Key deposit, 25 cents.

116. TEXTILES. Junior year, first and second semesters. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Organic Chemistry (Chem. 121). 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. Laboratory charge, $2.

126. CLOTHING III. Elective, both semesters. Class work, one hour; laboratory, six hours. Three 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. Key deposits, 25 cents.

130. CLOTHING SALESMANSHIP. Elective, second semester. Offered in 1922-'23 and alternate years thereafter. Class work, two hours. Two semester credits. Prerequisite: Costume Design I. Open to students upon consultation with the instructor.

This course provides an introduction to the problems which present them-

selves 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 whom credit may be arranged if planned before registration.

FOR GRADUATES AND UNDERGRADUATES

237. CLOTHING ECONOMICS. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Economics (Econ. 101). Professor Baker and Associate Professor Cowles.

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.

238. PROBLEMS IN ELEMENTARY CLOTHING TECHNIC. Elective, second semester. From two to four semester credits. Prerequisites: Clothing II, and Costume Design, or equivalents. Professor Baker and Associate Professor Cowles.

Students are assigned problems in relation to the methods and qualities of technic of clothing construction and means of testing and grading progress in accomplishment.

239. HISTORY OF TEXTILES. Elective, first semester. From one to four semester credits. Prerequisites: Textiles and American Industrial History, or equivalents. Miss Fecht.

Students are assigned special problems in the relation of the growth of the textiles industries and trades to the other forces of civilization.

240. HYGIENE OF CLOTHING. Elective, first semester. From two to four semester credits. Prerequisites: Textiles, Embryology and Physiology, and Microbiology, or equivalents. Professor Baker.

Students are assigned special problems for investigation of clothing in relation to health and its effect upon anatomical form, muscular development and physiological functions.

241. PROBLEMS IN COSTUME. Elective, both semesters. From two to five semester credits. Prerequisites: Costume Design II (Clo. and Text. 108), Psychology (Educ. 103), and Sociology (Econ. 151), or equivalents. Miss Clarke.

Assignments are made of problems in the æsthetic and psychological value of clothing involving the relationships of color, material, cut, and decoration of garments; or to problems in the sociological aspect of costume, including the relation of dress to the state of civilization, the architecture, the religion, the means of transportation, the predominant occupations, the form of amusements, the status of women, and the like.

FOR GRADUATES

301. RESEARCH IN CLOTHING AND TEXTILES. Elective, both semesters. Two to ten semester credits. Prerequisites: Consult instructors. Professor Baker 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. The nature of the problem will depend upon the problem courses which have been elected.

# Food Economics and Nutrition

Professor PITTMAN
Associate Professor KRAMER
Associate Professor RUBY
Assistant Professor HUDSON
Instructor BENNETT
Instructor AHLBORN
Graduate Assistant SHAW

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 training for teachers of foods, dietitians, demonstrators, extension workers, and similar professions.

The equipment belonging to this department is valued at $15,664.

## 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 (Chem. 101). Miss Bennett, Miss Ahlborn, and Miss Shaw.

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. Laboratory charge, $4; key deposit, 25 cents.

106. FOODS II. Sophomore year, both semesters. Class work, three hours; laboratory, six hours. Five semester credits. Prerequisites: Organic Chemistry (Chem. 121), Foods I or a knowledge of cookery and the ability to use the laboratory equipment intelligently. Professor Pittman, Assistant Professor Hudson, Miss Bennett, and Miss Ahlborn.

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 values as affected by admixture with other food materials. Recipes are compiled. Practice is given in judging food preparations. Laboratory charge, $4.25; key deposit, 25 cents.

112. HUMAN NUTRITION. Junior year, both semesters. Lectures and recitations, three hours. Three semester credits. Prerequisites: Organic Chemistry (Chem. 121), Embryology and Physiology (Zoöl. 201), and Foods II.† Associate Professor Kramer.

† 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.

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, second semester. Laboratory, three hours. One semester credit. Prerequisite: Foods II. 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. Laboratory charge, $3; key deposit, 25 cents.

120. PROBLEMS IN ELEMENTARY FOODS TECHNIC. Elective, second semester. Laboratory work, three hours. One semester credit. Prerequisite: Senior standing. Assistant Professor Hudson.

All senior students who plan to teach foods are expected to elect this course. Various problems in elementary foods technique are presented in order to strengthen the general foods training and secure more effective teaching. Laboratory charge, $3; key deposit, 25 cents.

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. Associate Professor Ruby, and Assistant Professor Hudson.

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 in health and in disease 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.) Laboratory charge, $6; key deposit, 25 cents.

205. DIETETICS FOR ABNORMAL CONDITIONS. Elective, second semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Dietetics. Associate Professors Kramer and Ruby.

Students who expect to qualify as professional dietitians, either in hospital work or elsewhere, should elect this course. In class discussions, a study is made of the varying dietetic requirements in different pathological conditions, such as diabetes, nephritis, gout, gastric ulcer, etc. Laboratory work involves demonstrations of special foods used in such conditions and dietaries are computed and scored. Laboratory charge, $3; key deposit, 25 cents.

215. FIELD WORK IN NUTRITION. Elective, first semester. From two to three semester credits. Hours to be arranged. Prerequisites: Human Nutrition, and Dietetics. Associate Professor Ruby and Assistant Professor Hudson.

This course comprises survey work along nutritional lines and corrective work with malnourished individuals, either separately or in groups. Laboratory charge, $1.

243. PROBLEMS IN FOODS I. Elective, first semester. From one to three semester credits. Hours to be arranged. Prerequisites: Foods II and Human Nutrition. Professor Pittman and Miss Ahlborn.

Special problems are assigned to students for individual consideration. Laboratory charge, $2 per credit hour; key deposit, 25 cents.

244. PROBLEMS IN FOODS II. Elective, second semester. From one to three semester credits. Hours to be arranged. Prerequisites: Foods II, and Human Nutrition. Professor Pittman and Miss Ahlborn.

This course may be taken as a continuation of course 243 or may be elected independently. Laboratory charge, $2 per credit hour; key deposit, 25 cents.

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. Associate Professors Kramer and Ruby.

The work in 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. Laboratory charge depends upon the problem chosen.

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. Associate Professors Kramer and Ruby.

This course may be taken as a continuation of course 248 or may be elected independently. Laboratory charge depends upon problem chosen.

251. FOOD ECONOMICS AND NUTRITION SEMINAR I. Elective, first semester. Class work, two hours. One or two semester credits. Prerequisite: Human Nutrition. Associate Professor Kramer.

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. Associate Professor Kramer.

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. Professor Pittman, and Associate Professor Kramer.

Individual research problems are assigned, which may form the basis for the thesis submitted for a master's degree. Laboratory charge, $5 and up, depending upon the problem chosen.

# Household Economics

Professor LEAZENBY ENGLUND
Assistant Professor BISHOP *
Assistant Professor BATES
Instructor DOBBS
Instructor GIFFORD **
Assistant STEWART
Graduate Assistant RUST

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.

The department owns equipment valued at $35,661.

## COURSES IN HOUSEHOLD ECONOMICS

FOR UNDERGRADUATES

103. ELEMENTARY HYGIENE AND HOME NURSING.‡ Freshman year, both semesters. Class work, two hours; laboratory, three hours. Three semester credits. Miss Dobbs.

Emphasis is placed upon personal hygiene as a means of maintaining and improving health in the home, and the best methods of caring for the sick in the home are discussed.

*Laboratory.*—The laboratory work consists of demonstrations and laboratory practice by the student in the home care of the sick, including such problems as bed-making, simple devices for the comfort of patient, bathing, etc., as well as a study of the treatment of emergencies. Laboratory charge, 50 cents.

107. HOUSEHOLD MANAGEMENT. Junior year, both semesters. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Household Physics (Physics 101), Foods II (Food and Nut. 106), and Clothing II (Clo. and Text. III). Miss Gifford.

The class work includes a study of the organization and simplification of housework through efficiency in house planning and construction, and in methods of housekeeping; standards of living and family expenditures, budgets, and accounts; problems of household service; experiments of coöperative laundering, kitchens, etc.; the amount of time necessary for housework; and the use of leisure time.

*Laboratory.*—Comparative studies are made of mechanical household appliances, convenient placing and grouping of equipment; durability and economy tests of cooking utensils, floor and wall finishes, and cleaning agents; and the gathering of data on time studies of various household tasks. Laboratory charge, $1.

109. HOME NURSING. Elective, both semesters. Laboratory, three hours. One semester credit. Prerequisites: Household Microbiology (Bact. 121) and Embryology and Physiology (Zoöl. 201). Miss Dobbs.

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. Laboratory charge, 50 cents.

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* Absent on leave, 1924-'25.
** Temporary appointment, 1924-'25.
‡ This course may be taken in place of Foods I, with the approval of the dean of the division.

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 (Physics 101) and Foods II (Food and Nut. 106). Prerequisite or parallel: Household Management. Consult instructor. Miss Gifford.

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.

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 (Zoöl. 201), Household Microbiology (Bact. 121), Psychology (Educ. 103), Human Nutrition (Food and Nut. 112), Clothing II (Clo. and Text. 111), and Textiles (Clo. and Text. 116). Professor Leazenby Englund.

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 (Physics 101), Embryology and Physiology (Zoöl. 201), Household Microbiology (Bact. 121). Dean Justin, and Professor Leazenby Englund.

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.

215. HEALTH PROBLEMS OF CHILDHOOD. Elective, both semesters. Class work, one hour; field work, three or six hours. Two to three semester credits. Prerequisite: Dietetics. Prerequisite or parallel: Child Welfare. Professor Leazenby Englund and Miss Dobbs.

The course consists of lectures and recitations dealing with the basic theories underlying the health problems of childhood; and in the planning of health programs for children. Supervised field work is given the students in which they deal with practical problems and personally conduct health classes and programs.

221. INSTITUTIONAL MANAGEMENT I. Elective, both semesters. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Foods II (Food and Nut. 106); prerequisite or parallel: Human Nutrition (Food and Nut. 112). Miss Stewart.

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. Laboratory charge, $1.

226. INSTITUTIONAL MANAGEMENT II. Elective, both semesters. Class work, three hours; laboratory, three hours. Four semester credits. Prerequisite: Institutional Management I. Assistant Professor Bates.

This course includes a study of the various types of institutions; the quali-

fications 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. Laboratory charge, $1.

231. THE MODERN FAMILY. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: senior or graduate standing. Consult instructor. Professor Leazenby Englund.

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.

243. PROBLEMS IN HOUSEHOLD ECONOMICS. Elective, both semesters. One to five semester credits. Prerequisite: Household Management. Consult instructor. Professor Leazenby Englund.

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 Bates.

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. Professor Leazenby Englund.

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 Leazenby Englund, and Assistant Professor Bates.

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 Leazenby Englund, and Assistant Professor Bates.

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.

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## Special Course in Home Economics

The housekeeper's course, which is completed in fifteen weeks or less, is described with other special courses in another part of this catalogue. It 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 professional and 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 of 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. 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, esthetic and ethical 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, advanced work not included in the 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 a 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 home economics and mechanic arts have been planned to meet the needs of prospective teachers of household arts and 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, and on later pages 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 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. 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.

## CURRICULUM IN INDUSTRIAL CHEMISTRY

The facilities for instruction in chemistry are ample, and the demand of students for a curriculum planned especially to give chemical training is such that a formulation has been made to meet the needs of those desiring to specialize in industrial chemistry. A curriculum in chemical engineering is also offered in the Division of Engineering. 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 a 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 curricula in music.

Students who complete one of the four-year curricula in voice or an instrument, or in public-school music, are awarded the degree of Bachelor of Music. They are also eligible to receive a three-year state teachers' certificate, renewable for life.

A student completing the first two years of the curriculum in public-school music is awarded a certificate, and becomes eligible to receive from the State Board of Education a three-year state certificate as teacher or supervisor of public-school music. This certificate is renewable for three-year periods.

## 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<br>Engl. 101 | 3(3-0) | College Rhetoric II<br>Engl. 104 | 3(3-0) |
| Chemistry I<br>Chem. 101 | 5(3-6) | Chemistry II<br>Chem. 102 | 5(3-6) |
| Plane Trigonometry*<br>Math. 101 | 3(3-0) | College Algebra*<br>Math. 104 | 3(3-0) |
| General Botany I<br>Bot. 101 | 3(1-4, 2) | General Botany II<br>Bot. 105 | 3(1-4, 2) |
| Current History<br>Hist. 126 | 1(1-0) | Current History<br>Hist. 126 | 1(1-0) |
| Library Methods<br>Lib. Ec. 101 | 1(1-0) | Elective† | 2( - ) |
| Infantry I (Men)<br>Mil. Tr. 101 | 1½(0-4) | Infantry II (Men)<br>Mil. Tr. 102 | 1½(0-4) |
| Physical Education M-I (Men)<br>Phys. Ed. 103 | R(0-2) | Physical Education M-II (Men)<br>Phys. Ed. 104 | R(0-2) |
| Physical Education W-I (Women)<br>Phys. Ed. 151A | 1(0-3) | Physical Education W-II (Women)<br>Phys. Ed. 152A | 1(0-3) |

### SOPHOMORE

| First Semester | | Second Semester | |
|---|---|---|---|
| English Literature<br>Engl. 172 | 3(3-0) | American Literature<br>Engl. 175 | 3(3-0) |
| English History<br>Hist. 121 | 3(3-0) | Modern Europe<br>Hist. 223 | 3(3-0) |
| General Physics I<br>Physics 135 | 4(3-3) | General Physics II<br>Physics 140 | 4(3-3) |
| General Zoölogy<br>Zoöl. 105 | 5(3-6) | | |
| Elective | 2( - ) | Elective† | 6( - ) |
| Infantry III (Men)<br>Mil. Tr. 103 | 1½(0-4) | Infantry IV (Men)<br>Mil. Tr. 104 | 1½(0-4) |
| Physical Education M-III (Men)<br>Phys. Ed. 105 | R(0-2) *or* | Physical Education M-IV (Men)<br>Mil. Tr. 104 | R(0-2) |
| Physical Education W-III (Women)<br>Phys. Ed. 153 | 1(0-3) | Physical Education W-IV (Women)<br>Phys. Ed. 154 | 1(0-3) |

### JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| History of English Literature<br>Engl. 181 | 3(3-0) | American History I<br>Hist. 201 | 3(3-0) |
| American Government<br>Hist. 151, 152 *or* 153 | 3(3-0) | Economics<br>Econ. 101 | 3(3-0) |
| Psychology C<br>Educ. 103 | 3(3-0) | General Microbiology<br>Bact. 101 | 3(1-6) |
| Extempore Speech I<br>Pub. Spk. 106 | 2(2-0) | | |
| Elective† | 5( - ) | Elective† | 7( - ) |

### 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 | |
| | | Lib. Ec. 101 | 1(1-0) |
| Current History | | Current History | |
| Hist. 126 | 1(1-0) | Hist. 126 | 1(1-0) |
| Options* | 4( - ) | Options* | 4( - ) |
| Industrial Journalism Lecture | R | Industrial Journalism Lecture | R |
| Infantry I (Men) | | Infantry II (Men) | |
| Mil. Tr. 101 | 1½(0-4) | Mil. Tr. 102 | 1½(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 | |
|---|---|---|---|
| English Literature | | American Literature | |
| Engl. 172 | 3(3-0) | Engl. 175 | 3(3-0) |
| General Zoölogy | | General Botany II | |
| Zoöl. 105 | 5(3-6) *or* | Bot. 105 | 3(1-4, 2) |
| General Botany I | | General Microbiology | |
| Bot. 101 | 3(1-4, 2) | Bact. 101 | 3(1-6) |
| | | *General Botany I is chosen the first semester.* | |
| Elementary Journalism | | Industrial Writing | |
| Ind. Jour. 151 | 2(2-0) | Ind. Jour. 161 | 2(2-0) |
| Journalism Practice I | | Journalism Practice II | |
| Ind. Jour. 154 | 2(0-6) | Ind. Jour. 155 | 2(0-6) |
| French I | | French II | |
| Mod. Lang. 151 | 3(3-0) | Mod. Lang. 152 | 3(3-0) |
| Spanish I | | Spanish II | |
| Mod. Lang. 176 | 3(3-0) | Mod. Lang. 177 | 3(3-0) |
| Options* | 2 or 4( - ) | Options* | 7 or 4( - ) |
| Industrial Journalism Lectures | R | Industrial Journalism Lectures | R |
| Infantry III (Men) | | Infantry IV (Men) | |
| Mil. Tr. 103 | 1½(0-4) | Mil. Tr. 104 | 1½(0-4) |
| Physical Education M-III (Men) | | Physical Education M-IV (Men) | |
| Phys. Ed. 105 | R(0-2) | Phys. Ed. 106 | R(0-2) |
| Physical Training W-III (Women) | | Physical Training W-IV (Women) | |
| Phys. Ed. 153 | 1(0-3) | Phys. Ed. 154 | 1(0-3) |

18½ 18½

* 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<br>Ind. Jour. 167 | 2(2-0) | Industrial Feature Writing II<br>Ind. Jour. 171 | 2(2-0) |
| Journalism Practice III<br>Ind. Jour. 158 | 2(2-6) | Journalism Practice IV<br>Ind. Jour. 159 | 2(0-6) |
| Extempore Speech I<br>Pub. Spk. 106 | 2(2-0) | Principles of Advertising<br>Ind. Jour. 179 | 3(3-0) |
| | | History of English Literature<br>Engl. 181 | 3(3-0) |
| Options and Electives* | 10( - ) | Options and Electives* | 3( - ) |
| Industrial Journalism Lectures | R | Industrial Journalism Lectures | R |

### SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Circulation and Advertising Promotion<br>Ind. Jour. 251 | 3(3-0) | Editorial Practice<br>Ind. Jour. 257 | 2(2-0) |
| Copy Reading<br>Ind. Jour. 254 | 2(0-6) | Ethics of Journalism<br>Ind. Jour. 260 | 2(2-0) |
| Contemporary Thought<br>Ind. Jour. 255 | 3(3-0) | | |
| Electives and Options* | 8( - ) | Electives and Options* | 11( - ) |
| Industrial Journalism Lectures | R | Industrial Journalism Lectures | 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<br>Engl. 101 | 3(3-0) | College Rhetoric II<br>Engl. 104 | 3(3-0) |
| Chemistry I<br>Chem. 101 | 5(3-6) | Chemistry II<br>Chem. 102 | 5(3-6) |
| Plane Trigonometry†<br>Math. 101 | 3(3-0) | College Algebra†<br>Math. 104 | 3(3-0) |
| Engineering Drawing<br>Mach. Design 101 | 2(0-6) | Descriptive Geometry<br>Mach. Design 106 | 2(0-6) |
| Commercial Law<br>Hist. 160 | 1(1-0) | Machine Drawing I<br>Mach. Design 111 | 2(0-6) |
| Engineering Woodwork I<br>Shop 101 | 1(0-3) | Library Methods<br>Lib. Ec. 101 | 1(1-0) |
| Forging I<br>Shop 150 | 1(0-3) | | |
| Infantry I (Men)<br>Mil. Tr. 101 | 1½(0-4) | Infantry II (Men)<br>Mil. Tr. 102 | 1½(0-4) |
| Physical Education M-I (Men)<br>Phys. Ed. 103 | R(0-2) *or* | Physical Education M-II (Men)<br>Phys. Ed. 104 | R(0-2) *or* |
| Physical Education W-I (Women)<br>Phys. Ed. 151A | 1(0-3) | Physical Education W-II (Women)<br>Phys. Ed. 152A | 1(0-3) |

* See footnote on previous page.

† 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.

## 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 | 1½(0-4) | Mil. Tr. 104 | 1½(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) |

## JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| German I | | German II | |
| Mod. Lang. 101 | 3(3-0) | Mod. Lang. 102 | 3(3-0) |
| Inorganic Preparations | | | |
| Chem. 202 | 2(0-6) | | |
| Physical Chemistry | | History of Chemistry | |
| Chem. 206 | 5(3-6) | Chem. 208 | 1(1-0) |
| Fire Assaying | | Industrial Electrochemistry | |
| Chem. 242 | 2(0-6) | Chem. 205 | 2(2-0) |
| Gas Analysis | | Electrical Engineering C | |
| Chem. 243 | 1(0-3) | Elect. Engr. 160, 165 | 3(2-2, 1) |
| Electives † | 3( - ) | Electives† | 7( - ) |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| American Government | | Economics | |
| Hist. 151, 152 or 153 | 3(3-0) | Econ. 101 | 3(3-0) |
| Industrial Chemistry I | | Industrial Chemistry II | |
| Chem. 203 | 5(3-6) | Chem. 204 | 5(3-6) |
| Scientific German I | | | |
| Mod. Lang. 237 | 4(4-0) | | |
| Electives † | 4( - ) | Electives † | 8( - ) |
| Thesis | R | Thesis | R |

† 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 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.

### FRESHMAN

| First Semester | | Second Semester | |
|---|---|---|---|
| Voice A-1 | | Voice A-II | |
| Mus. 161A | 2(1-6) | Mus. 161B | 2(1-6) |
| Piano B-1 | | Piano B-II | |
| Mus. 174A | 1(½-6) | Mus. 174B | 1(½-6) |
| Public School Music I | | Public School Music II | |
| Mus. 120 | 2(2-0) | Mus. 121 | 2(2-0) |
| 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) |
| Psychology B | | Methods of Teaching A | |
| Educa. 102 | 3(3-0) | Educ. 111 | 3(3-0) |
| Choral Society I | | Choral Society II | |
| Mus. 190A | 1(1-0) | Mus. 190B | 1(1-0) |
| College Rhetoric I | | College Rhetoric II | |
| Engl. 101 | 3(3-0) | Engl. 104 | 3(3-0) |
| Infantry I (Men) | | Infantry II (Men) | |
| Mil. Tr. 101 | 1½(0-4) | Mil. Tr. 102 | 1½(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 | |
|---|---|---|---|
| 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) |
| Public School Music III | | Public School Music 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) |
| Ear Training and Sight Singing III | | Ear Training and Sight Singing IV | |
| Mus. 107 | 2(2-0) | Mus. 108 | 2(2-0) |
| Choral Society III | | Choral Society IV | |
| Mus. 190C | 1(1-0) | Mus. 190D | 1(1-0) |
| History and Appreciation of Music I | | History and Appreciation of Music II | |
| Mus. 112 | 3(3-0) | Mus. 113 | 3(3-0) |
| Educational Administration A | | English Literature | |
| Educ. 105 | 3(3-0) | Engl. 172 | 3(3-0) |
| | | Conducting | |
| | | Mus. 117 | 1(1-0) |
| Infantry III (Men) | | Infantry IV (Men) | |
| Mil. Tr. 103 | 1½(0-4) | Mil. Tr. 104 | 1½(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) |

### JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Public School Music V Mus. 124 | 2(2-0) | Public School Music VI Mus. 125 | 2(2-0) |
| Counterpoint Mus. 108A | 2(2-0) | Harmonics Physics 222 | 2(2-0) |
| Instrumentation Mus. 130 | 2(2-0) | Orchestration Mus. 133 | 2(2-0) |
| Chorus, Orchestra or Band | 1(1-0) | Chorus, Orchestra, or Band | 1(1-0) |
| Educational Psychology Educ. 109 | 3(3-0) | | |
| Methods of Teaching Music Mus. 145 | 1(1-0) | Practice Teaching of Music Mus. 188 | 2(2-0) |
| Elective in Voice or Instrument Mus. | 2(1-6) | Elective in Education | 3(3-0) |
| Electives | 3( - ) | Elective in Voice or Instrument Mus. | 2(1-6) |
| | | Electives | 3( - ) |

### SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Public School Music VII Mus. 126 | 2(2-0) | Public School Music VIII Mus. 127 | 2(2-0) |
| Musical Form and Analysis Mus. 109 | 2(2-0) | Extempore Speech I Pub. Spk. 106 | 2(2-0) |
| Production of Community Drama and Pageantry Pub. Spk. 145 | 3(3-0) | Oral English Eng. 128 | 3(3-0) |
| Chorus, Orchestra, or Band | 1(1-0) | Chorus, Orchestra, or Band | 1(1-0) |
| Elective in Voice or Instrument | 2(2-0) | Elective in Voice or Instrument, | 2(2-0) |
| Elective in Education | 3(3-0) | Electives | 6( - ) |
| Electives | 4( - ) | | |

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## 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 Mus. 160A | 4(1-12) | Voice II Mus. 160B | 4(1-12) |
| History and Appreciation of Music I Mus. 112 | 3(3-0) | History and Appreciation of Music II Mus. 113 | 3(3-0) |
| Current History Hist. 126 | 1(1-0) | Current History Hist. 126 | 1(1-0) |
| | | Library Methods Lib. Ec. 101 | 1(1-0) |
| 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) |
| Ensemble I Mus. 190A, 193A, *or* 196A | 1(1-0) | Ensemble II Mus. 190B, 193B, *or* 196B | 1(1-0) |
| College Rhetoric I Engl. 101 | 3(3-0) | College Rhetoric II Engl. 104 | 3(3-0) |
| Infantry I (Men) Mil. Tr. 101 | 1½(0-4) | Infantry II (Men) Mil. Tr. 102 | 1½(0-4) |
| Physical Education M-I (Men) Phys. Ed. 103 | R(0-2) *or* | Physical Education M-II (Men) Phys. Ed. 104 | R(0-2) *or* |
| Physical Education W-I (Women) Phys. Ed. 151A | 1(0-3) | Physical Education W-II (Women) Phys. Ed. 152A | 1(0-3) |

## SOPHOMORE

| First Semester | | Second Semester | |
|---|---|---|---|
| Voice III<br>Mus. 160C | 4(1-12) | Voice IV<br>Mus. 160D | 4(1-12) |
| Piano A-I<br>Mus. 172A | 2(1-6) | Piano A-II<br>Mus. 172B | 2(1-6) |
| Harmony III<br>Mus. 103 | 2(2-0) | Harmony IV<br>Mus. 104 | 2(2-0) |
| Ensemble III<br>Mus. 190C, 193C, *or* 196C | 1(1-0) | Ensemble IV<br>Mus. 190D, 193D, *or* 196D, | 1(1-0) |
| Recital I<br>Mus. 184A | R( - ) | Recital II<br>Mus. 184B | R( - ) |
| English Literature<br>Engl. 172 | 3(3-0) | Harmonics<br>Physics 222 | 2(2-0) |
| Psychology B<br>Educ. 102 | 3(3-0) | Educational Psychology<br>Educ. 109 | 3(3-0) |
| Infantry III (Men)<br>Mil. Tr. 103 | 1½(0-4) | Infantry IV (Men)<br>Mil. Tr. 104 | 1½(0-4) |
| Physical Education M-III (Men)<br>Phys. Ed. 105 | R(0-2) *or* | Physical Education M-IV (Men)<br>Phys. Ed. 106 | R(0-2) *or* |
| Physical Education W-III( Women)<br>Phys. Ed. 153 | 1(0-3) | Physical Education W-IV (Women)<br>Phys. Ed. 154 | 1(0-3) |
| | | Elective | 2( - ) |

## JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Voice V<br>Mus. 160E | 4(1-12) | Voice VI<br>Mus. 160F | 4(1-12) |
| Methods of Teaching Music<br>Mus. 145 | 1(1-0) | Practice Teaching of Music<br>Mus. 188 | 2(2-0) |
| Counterpoint<br>Mus. 108A | 2(2-0) | Musical Form and Analysis<br>Mus. 109 | 2(2-0) |
| Ensemble V<br>Mus. 190E, 193E, *or* 196E | 1(1-0) | Ensemble VI<br>Mus. 190F, 193F, *or* 196F | 1(1-0) |
| Recital III<br>Mus. 184C | R( - ) | Recital IV<br>Mus. 184D | 2(2-0) |
| Piano A-III<br>Mus. 172C | 2(1-6) | Piano A-IV<br>Mus. 172D | 2(1-6) |
| German I<br>Mod. Lang. 101 | 3(3-0) | German II<br>Mod. Lang. 102 | 3(3-0) |
| Conducting<br>Mus. 117 | 1(1-0) | | |
| Elective | 3(3-0) | | |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Voice VII<br>Mus. 160G | 4(1-12) | Voice VIII<br>Mus. 160H | 4(1-12) |
| Instrumentation<br>Mus. 130 | 2(2-0) | Orchestration<br>Mus. 133 | 2(2-0) |
| Ensemble VII<br>Mus. 190G, 193G, *or* 196G, | 1-1-0) | Ensemble VIII<br>Mus. 190H, 193H, *or* 196H, | 1(1-0) |
| Recital V<br>Mus. 184E | R( - ) | Recital VI<br>Mus. 184F | 2(2-0) |
| American Literature<br>Engl. 175 | 3(3-0) | | |
| French I<br>Mod. Lang. 151 | 3(3-0) | French II<br>Mod. Lang. 152 | 3(3-0) |
| Repertoire I<br>Mus. 186A | 2(2-0) | Repertoire II<br>Mus. 186B | 2(2-0) |
| Elective | 2( - ) | Elective | 2( - ) |

# 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 | 4(1-18) | Mus. 170B | 4(1-18) |
| 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) |
| Ensemble I | | Ensemble II | |
| Mus. 190A, 193A, *or* 196A | 1(1-0) | Mus. 190B, 192B, *or* 196B | 1(1-0) |
| College Rhetoric I | | College Rhetoric II | |
| Engl. 101 | 3(3-0) | Eng. 104 | 3(3-0) |
| History and Appreciation of Music I | | History and Appreciation of Music II | |
| Mus. 110 | 3(3-0) | Mus. 111 | 3(3-0) |
| Current History | | Current History | |
| Hist. 126 | 1(1-0) | Hist. 126 | 1(1-0) |
| | | Library Methods | |
| | | Lib. Ec. 101 | 1(1-0) |
| Piano Ensemble I | | Piano Ensemble II | |
| Mus. 176A | R(1-0) | Mus. 176B | R(1-0) |
| Infantry I (Men) | | Infantry II (Men) | |
| Mil. Tr. 101 | 1½(0-4) | Mil. Tr. 102 | 1½(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 | |
| Phys. Ed. 151A | 1(0-3) | Phys. Ed. 152A | 1(0-3) |

## SOPHOMORE

| First Semester | | Second Semester | |
|---|---|---|---|
| Piano III | | Piano IV | |
| Mus. 170C | 4(1-18) | Mus. 170D | 4(1-18) |
| Voice A-I | | Voice A-II | |
| Mus. 161A | 2(1-6) | Mus. 161B | 2(1-6) |
| Harmony III | | Harmony IV | |
| Mus. 103 | 2(2-0) | Mus. 104 | 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 | R( - ) | Mus. 184B | R( - ) |
| English Literature | | Harmonics | |
| Engl. 172 | 3(3-0) | Physics 222 | 2(2-0) |
| Psychology B | | Educational Psychology | |
| Educ. 102 | 3(3-0) | Educ. 109 | 3(3-0) |
| Piano Ensemble III | | Piano Ensemble IV | |
| Mus. 176C | R(1-0) | Mus. 176D | R(1-0) |
| Infantry III (Men) | | Infantry IV (Men) | |
| Mil. Tr. 103 | 1½(0-4) | Mil. Tr. 104 | 1½(0-4) |
| Physical Education M-III (Men) | | Physical Education M-IV (Men) | |
| Phys. Ed. 106 | R(0-2) *or* | Phys. Ed. 105 | 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) |
| | | Electives | 2( - ) |

## JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Piano V | | Piano VI | |
| Mus. 170E | 4(1-18) | Mus. 170F | 4(1-18) |
| Counterpoint | | Musical Form and Analysis | |
| Mus. 108A | 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 | R( - ) | Mus. 184D | 2(2-0) |
| German I | | German II | |
| Mod. Lang. 101 | 3(3-0) | Mod. Lang. 102 | 3(3-0) |
| Normal Piano Methods | | Practice Teaching of Music | |
| Mus. 140 | 2(2-0) | Mus. 188 | 2(2-0) |
| Piano Ensemble V | | Piano Ensemble VI | |
| Mus. 176E | R(1-0) | Mus. 176F | R(1-0) |
| Conducting | | Elective | 2( - ) |
| Mus. 117 | 1(1-0) | | |
| Electives | 4( - ) | | |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Piano VII | | Piano VIII | |
| Mus. 170G | 4(1-18) | Mus. 170H | 4(1-18) |
| 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 | R( - ) | Mus. 184F | 2(2-0) |
| American Literature | | | |
| Engl. 175 | 3(3-0) | | |
| French I | | French II | |
| Mod. Lang. 151 | 3(3-0) | Mod. Lang. 152 | 3(3-0) |
| Piano Ensemble VII | | Piano Ensemble VIII | |
| Mus. 176G | R(1-0) | Mus. 176H | R(1-0) |
| Elective | 4( - ) | Elective | 4( - ) |

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# 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) |
| Harmony I | | Harmony II | |
| Mus. 101 | 2(2-0) | Mus. 102 | 2(2-0) |
| History and Appreciation of Music I | | History and Appreciation of Music I | |
| Mus. 112 | 3(3-0) | Mus. 113 | 3(3-0) |
| Current History | | Current History | |
| Hist. 126 | 1(1-0) | Hist. 126 | 1(1-0) |
| | | Library Methods | |
| | | Lib. Ec. 101 | 1(1-0) |
| Ear Training and Sight Singing I | | Ear Training and Sight Singing II | |
| Mus. 105 | 2(2-0) | Mus. 106 | 2(2-0) |
| 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) |
| Infantry I (Men) | | Infantry II (Men) | |
| Mil. Tr. 101 | 1½(0-4) | Mil. Tr. 102 | 1½(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 | |
|---|---|---|---|
| Violin II | | Violin IV | |
| Mus. 165C | 4(1-12) | Mus. 165D | 4(1-12) |
| Piano A-I | | Piano A-II | |
| Mus. 172A | 2(1-6) | Mus. 172B | 2(1-6) |
| Harmony III | | Harmony IV | |
| Mus. 103 | 2(2-0) | Mus. 104 | 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 | R( - ) | Mus. 184B | R( - ) |
| English Literature | | Harmonics | |
| Engl. 172 | 3(3-0) | Physics 222 | 2(2-0) |
| Phychology B | | Educational Psychology | |
| Educ. 102 | 3(3-0) | Educ. 109 | 3(3-0) |
| Infantry III (Men) | | Infantry IV (Men) | |
| Mil. Tr. 103 | 1½(0-4) | Mil. Tr. 104 | 1½(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) |
| | | Elective | 2( - ) |

## JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Violin V | | Violin VI | |
| Mus. 165E | 6(1-24) | Mus. 165F | 6(1-24) |
| Counterpoint | | Musical Form and Analysis | |
| Mus. 108A | 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 | R( - ) | Mus. 184D | 2(2-0) |
| Piano A-III | | Piano A-IV | |
| Mus. 172C | 2(1-6) | Mus. 172D | 2(1-6) |
| German I | | German II | |
| Mod. Lang. 101 | 3(3-0) | Mod. Lang. 102 | 3(3-0) |
| Methods of Teaching Music | | Practice Teaching of Music | |
| Mus. 145 | 1(1-0) | Mus. 188 | 2(2-0) |
| Conducting | | | |
| Mus. 117 | 1(1-0) | | |

## SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Violin VII | | Violin VIII | |
| Mus. 165G | 6(1-24) | Mus. 165H | 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 | R( - ) | Mus. 184F | 2(2-0) |
| French I | | French II | |
| Mod. Lang. 151 | 3(3-0) | Mod. Lang. 152 | 3(3-0) |
| American Literature | | | |
| Engl. 175 | 3(3-0) | | |
| Elective | 2( - ) | Elective | 2( - ) |

Note.—This footnote refers to Curriculum in Rural Commerce, page 221.

* 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. If Chemistry I is taken, Chemistry II is required also. 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 credits 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.

## 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 | | College Rhetoric II | |
| Engl. 101 | 3(3-0) | 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 * | | College Algebra * | |
| Math. 101 | 3(3-0) | Math. 104 | 3(3-0) |
| Extempore Speech I | | Extempore Speech II | |
| Pub. Spkg. 106 | 2(2-0) | Pub. Spkg. 108 | 2(2-0) |
| Current History | | Current History | |
| Hist. 126 | 1(1-0) | Hist. 126 | 1(1-0) |
| | | Library Methods | |
| | | Lib. Ec. 101 | 1(1-0) |
| Infantry I (Men) | | Infantry II (Men) | |
| Mil. Tr. 101 | 1½(0-4) | Mil. Tr. 102 | 1½(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 | |
|---|---|---|---|
| Commercial Correspondence | | Written and Oral Salesmanship | |
| Engl. 122 | 3(3-0) | Engl. 123 | 3(3-0) |
| Modern Language | 3(3-0) | Economics | |
| Am. Industrial History | | Econ. 101 | 3(3-0) *or* |
| Hist. 105 | 3(3-0) *or* | Agricultural Economics | |
| Am. Agricultural History | | Ag. Econ. 101 | 3(3-0) |
| Hist. 204 | 3(3-0) *or* | Business Management | |
| History of Commerce and Industry | | Econ. 126 | 2(2-0) |
| Hist. 110 | 3(3-0) | Business Law A | |
| | | Hist. 161 | 2(2-0) |
| Accounting Practice I * | | Accounting Practice II | |
| Math. 140A | 3(2-3) | Math. 143A | 3(2-3) |
| Psychology D | | Applied Psychology | |
| Educ. 104 | 3(3-0) | Educ. 215 | 2(2-0) |
| Electives | 3( - ) | Elective | 3( - ) |
| Infantry III (Men) | | Infantry IV (Men) | |
| Mil. Tr. 103 | 1½(0-4) | Mil. Tr. 104 | 1½(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) |

### JUNIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Principles of Advertising | | Mathematics of Investment | |
| Ind. Jour. 179 | 3(3-0) | Math. 150 | 3(3-0) |
| English Literature | | Money and Banking | |
| Engl. 172 | 3(3-0) | Econ. 116 | 2(2-0) |
| Cost Accounting | | Public Finance | |
| Econ. 131 | 2(2-0) *or* | Econ. 213 | 2(2-0) |
| Farm Cost Accounting | | Labor Problems | |
| Ag. Econ. 112 | 3(2-3) | Econ. 233 | 2(2-0) |
| Sociology | | American Government | |
| Econ. 151 | 3(3-0) | Hist. 151, 152 *or* 153 | 3(3-0) |
| Electives | 4 or 3( - ) | Electives | 4( - ) |

### SENIOR

| First Semester | | Second Semester | |
|---|---|---|---|
| Economic Geography | | Transportation Problems | |
| Econ. 121 | 3(3-0) | Econ. 229 | 2(2-0) |
| | | Latin America | |
| | | Hist. 207 | 2(2-0) |
| Elective | 13( - ) | Elective | 12( - ) |

* See footnote bottom page 220.

## 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 I 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 Engl. 128 | 3(3-0) | | |
| The Light Essay Engl. 225 | 2(2-0) | 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) |

### 2. English Literature

| First Semester | | Second Semester | |
|---|---|---|---|
| The English Bible Engl. 271 | 3(3-0) | | |
| The Shakespearean Drama I Engl. 273 | 3(3-0) | The Shakespearean Drama II Engl. 274 | 3(3-0) |
| Nineteenth Century Literature Engl. 277 | 3(3-0) | American Literature Engl. 175 | 3(3-0) |
| Contemporary Fiction Engl. 283 | 3(3-0) | 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) |
| World Classics I Engl. 280 | 3(3-0) | World Classics II Engl. 281 | 3(3-0) |

### 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) | German Classics Mod. Lang. 226 | 3(3-0) |

† 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.

## 4. French and Spanish

| First Semester | | Second Semester | |
|---|---|---|---|
| French I<br>Mod. Lang. 151 | 3(3-0) | French II<br>Mod. Lang. 152 | 3(3-0) |
| French Readings<br>Mod. Lang. 161 | 3(3-0) | French Short Stories<br>Mod. Lang. 251 | 3(3-0) |
| French Composition and Conversation<br>Mod. Lang. 261 | 3(3-0) | French Drama<br>Mod. Lang. 256 | 3(3-0) |
| Spanish I<br>Mod. Lang. 176 | 3(3-0) | Spanish II<br>Mod. Lang. 177 | 3(3-0) |
| Spanish Readings<br>Mod. Lang. 180 | 3(3-0) | Spanish Short Stories<br>Mod. Lang. 186 | 3(3-0) |
| The Spanish Novel<br>Mod. Lang. 275 | 3(3-0) | The Spanish Drama<br>Mod. Lang. 280 | 3(3-0) |
| Spanish Conversation<br>Mod. Lang. 195 | 2(2-0) | Spanish Conversation<br>Mod. Lang. 195 | 2(2-0) |

## 5. Mathematics

| First Semester | | Second Semester | |
|---|---|---|---|
| Plane Analytical Geometry<br>Math. 110 | 4(4-0) | Calculus<br>Math. 119 | 3(3-0) |
| Calculus I<br>Math. 205 | 5(5-0) | Calculus II<br>Math. 206 | 3(3-0) |
| Elements of Statistics<br>Math. 126 | 3(3-0) | Institutional Accounting<br>Math. 131 | 3(3-0) |
| Differential Equations<br>Math. 201 | 3(3-0) | Special Methods in the Teaching of Mathematics<br>Math. 122 | 3(3-0) |

## 6. Inorganic Chemistry

| First Semester | | Second Semester | |
|---|---|---|---|
| Advanced Inorganic Chemistry<br>Chem. 207 | 3(3-0) | Industrial Electrochemistry<br>Chem. 205 | 2(2-0) |
| Inorganic Preparations<br>Chem. 202 | 2(0-6) to 4(0-12) | Physical Chemistry<br>Chem. 206 | 5(3-6) |
| Industrial Chemistry I<br>Chem. 203 | 5(3-6) | Industrial Chemistry II<br>Chem. 204 | 5(3-6) |

## 7. Organic Chemistry

| First Semester | | Second Semester | |
|---|---|---|---|
| Organic Chemistry (Agr.)<br>Chem. 120 | 3(2-3) | Organic Chemistry II<br>Chem. 219 | 4(2-6) |
| Organic Chemistry I<br>Chem. 218 | 4(2-6) | Stereoisomeric and Tautomeric Compounds<br>Chem. 225 | 2(2-0) |
| Organic Preparations<br>Chem. 223 | 5(0-15) | Carbocyclic and Heterocyclic Compounds<br>Chem. 226 | 2(2-0) |
| Qualitative Org. Analysis<br>Chem. 224 | 2(0-6) | Physiological Chemistry<br>Chem. 231 | 5(3-6) |
| Physiological Chemistry I<br>Chem. 232 | 5(3-6) | Physiological Chemistry II<br>Chem. 233 | 5(3-6) |
| Pathological Chemistry<br>Chem. 235 | 2(2-0) | | |
| Organic Chemistry HE<br>Chem. 121 | 5(3-6) | | |

## 8. Analytical Chemistry

| First Semester | | Second Semester | |
|---|---|---|---|
| Quantitative Analysis A<br>Chem. 250 | 3(1-6) | Quantitative Analysis B<br>Chem. 251 | 3(1-6) |
| Advanced Qualitative Analysis<br>Chem. 240 | 3(1-6) | Household Chemistry<br>Chem. 265 | 3(1-6) |

## 9. Physics

| First Semester | | Second Semester | |
|---|---|---|---|
| Household Physics<br>Physics 101 | 4(3-3) | Harmonics<br>Physics 222 | 2(2-0) |
| Photography<br>Physics 120 | 2(1-3) | Special Methods in the Teaching of Physics<br>Physics 224 | 3(2-3) |
| Molecular Physics and Heat<br>Physics 220 | 3(2-3) | Meteorology<br>Physics 133 | 2(2-0) |
| Wireless Telephony<br>Physics 130 | 2(1-3) | Descriptive Astronomy<br>Physics 155 | 3(3-0) |
| Spectroscopy<br>Physics 230 | 3(1-6) | Storage Batteries<br>Physics 235 | 2(1-3) |
| Radio Measurements<br>Physics 245 | 2(1-3) | Radioactivity and Electron Theory<br>Physics 233 | 3(3-0) |

## 10. Microbiology

| First Semester | | Second Semester | |
|---|---|---|---|
| Agricultural Microbiology<br>Bact. 106 | 3(1-6) | Soil Microbiology<br>Bact. 201 | 3(1-6) |
| Hygienic Bacteriology<br>Bact. 206 | 4(2-6) | Pathogenic Bacteriology I<br>Bact. 111 | 4(2-6) |
| Pathogenic Bacteriology II<br>Bact. 116 | 4(2-6) | Dairy Bacteriology<br>Bact. 211 | 3(1-6) |
| Poultry Bacteriology<br>Bact. 216 | 3(1-6) | | |

## 11. Botany

| First Semester | | Second Semester | |
|---|---|---|---|
| General Botany I<br>Bot. 101 | 3(1-4, 2) | Morphology of Plants<br>Bot. 236 | 2(0-6) |
| Plant Pathology I<br>Bot. 205 | 3(1-4, 2) | Plant Histology<br>Bot. 215 | 2(0-6) |
| Mycology I<br>Bot. 204 | 4(2-4, 2) | Mycology II<br>Bot. 206 | 3 to 5( - ) |
| Plant Physiology I<br>Bot. 130 | 3(3-0) | Plant Physiology II<br>Bot. 209 | 2(0-6) |
| Fruit Crop Diseases<br>Bot. 202 | 2(1-2, 1) | Plant Ecology<br>Bot. 228 | 2(2-0) |
| Botanical Problems<br>Bot. 232 | 1 to 5( - ) | Field Crop Diseases<br>Bot. 240 | 2(1-2, 1) |
| Taxonomic Botany of the Flowering Plants<br>Bot. 225 | 3(1-4, 2) | Vegetable Diseases<br>Bot. 245 | 2(1-2, 1) |

## 12. Zoölogy

| First Semester | | Second Semester | |
|---|---|---|---|
| Cytology<br>Zoöl. 214 | 4(2-6) | Animal Ecology<br>Zoöl. 211 | 3(1-6) |
| Parasitology<br>Zoöl. 208 | 3(2-3) | Ornithology<br>Zoöl. 230 | 2(1-3) |
| Taxonomy of Parasites<br>Zoöl. 240 | 2(1-3) | Embryology<br>Zoöl. 219 | 3(2-3) |
| Field Zoölogy<br>Zoöl. 205 | 3(1-6) | Advanced Embryology<br>Zoöl. 220 | 4(2-6) |
| Heredity and Eugenics<br>Zoöl. 216 | 2(2-0) | Parasites and Public Health<br>Zoöl. 218 | 3(3-0) |
| Zoölogical Problems<br>Zoöl. 203 | 1 or 2( - ) | Zoölogical Problems<br>Zoöl. 203 | 1 or 2( - ) |
| Zoölogical Technic<br>Zoöl. 206 | 1 or 2( - ) | Zoölogical Technic<br>Zoöl. 206 | 1 or 2( - ) |

## 13. Geology

| First Semester | | Second Semester | |
|---|---|---|---|
| Engineering Geology<br>Geol. 102 | 4(2-6) | Historical Geology<br>Geol. 201 | 2(2-0) |
| Economic Geology<br>Geol. 206 | 3(2-3) | General Geology<br>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 B Ent. 228 | 3(2-3) | Taxonomy of Insects I Ent. 217 | 2(0-6) |

## 15. History and Civics

| First Semester | | Second Semester | |
|---|---|---|---|
| American History II Hist. 202 | 3(3-0) | American History III Hist. 203 | 3(3-0) |
| American Industrial History Hist. 105 | 3(3-0) | Europe (1500 to 1815) Hist. 115 | 3(3-0) |
| History of Commerce and Industry Hist. 110 | 3(3-0) | Modern Europe (since 1814) Hist. 223 | 3(3-0) |
| Latin America Hist. 207 | 2(2-0) | Immigration and International Relations Hist. 228 | 2(2-0) |
| The British Empire Hist. 226 | 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) |
| American National Government Hist. 152 | 3(3-0) | American State Government Hist. 153 | 3(3-0) |

## 16. Law

| First Semester | | Second Semester | |
|---|---|---|---|
| Business Law A Hist. 161 | 2(2-0) | Business Law B Hist. 162 | 2(2-0) |
| Commercial Law Hist. 160 | 1(1-0) | Farm Law Hist. 175 | 2(2-0) |

## 17. Economics and Sociology

| First Semester | | Second Semester | |
|---|---|---|---|
| Economics Econ. 101 | 3(3-0) | Economic Geography Econ. 121 | 3(3-0) |
| Sociology Econ. 151 | 3(3-0) | Rural Sociology Econ. 156 | 3(3-0) |
| Money and Banking Econ. 116 | 2(2-0) | Business Management Econ. 126 | 2(2-0) |
| Labor Problems Econ. 233 | 2(2-0) | Public Finance Econ. 213 | 2(2-0) |
| Marketing Practice Econ. 245 | 2(2-0) | Insurance Econ. 240 | 2(2-0) |

## 18. Education

| First Semester | | Second Semester | |
|---|---|---|---|
| Educational Administration A *or* B Educ. 105 *or* 106 | 3(3-0) | Methods of Teaching A Educ. 111 | 3(3-0) |
| History of Education A Educ. 113 | 3(3-0) | Educational Psychology A *or* B Educ. 118 *or* 119 | 3(3-0) |
| Supervised Teaching and Observation in Science Educ. 163 | 3(1-6) | Statistical Methods Applied to Education Educ. 223 | 3(3-0) |
| Rural Education Educ. 201 | 3(3-0) | The Psychology of Childhood and Adolescence Educ. 208 | 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) |
| Educational Tests and Measurements Educ. 212 | 3(3-0) | Advanced Psychology Educ. 216 | 3(3-0) |
| Applied Psychology Educ. 215 | 2(2-0) | | |

## 19. Vocational Education

| First Semester | | Second Semester | |
|---|---|---|---|
| Vocational Education A<br>Educ. 125 | 3(3-0) | Special Methods in the Teaching of Agriculture<br>Educ. 136 | 3(3-0) |
| Vocational Education B<br>Educ. 226 | 3(3-0) | Supervised Observation and Teaching in Agriculture<br>Educ. 161 | 3(0-9) |
| | | Special Methods in the Teaching of Home Economics<br>Educ. 132 | 3(3-0) |
| | | Supervised Teaching in Home Economics<br>Educ. 160 | 3(0-9) |
| Agricultural Education B<br>Educ. 330 | 3(3-0) | Special Methods in the Teaching of Industrial Arts Subjects<br>Educ. 140 | 3(3-0) |
| | | Supervised Observation and Teaching in Industrial Arts<br>Educ. 162 | 3(0-9) |

## 20. Industrial Journalism

| First Semester | | Second Semester | |
|---|---|---|---|
| Elementary Journalism<br>Ind. Jour. 151 | 2(2-0) | Industrial Writing<br>Ind. Jour. 161 | 2(2-0) |
| Journalism Practice I<br>Ind. Jour. 154 | 2(0-6) | Journalism Practice II<br>Ind. Jour. 155 | 2(0-6) |
| Industrial Feature Writing I<br>Ind. Jour. 167 | 2(2-0) | Industrial Feature Writing II<br>Ind. Jour. 171 | 2(2-0) |
| Journalism Practice III<br>Ind. Jour. 158 | 2(0-6) | Journalism Practice IV<br>Ind. Jour. 159 | 2(0-6) |
| Materials of Journalism<br>Ind. Jour. 265 | 2(2-0) | Magazine Features<br>Ind. Jour. 270 | 2(2-0) |
| History of Journalism<br>Ind. Jour. 274 | 2(2-0) | Journalism Surveys<br>Ind. Jour. 278 | 2(0-6) |

## 23. Music

Voice A (Music 161A to 161H)

Two private lessons a week. Two semester credits per semester.

Piano A (Music 172A to 172H)

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.

| First Semester | | Second Semester | |
|---|---|---|---|
| Harmony I<br>Music 101 | 2(2-0) | Harmony II<br>Music 102 | 2(2-0) |
| Harmony III<br>Music 103 | 2(2-0) | Harmony IV<br>Music 104 | 2(2-0) |
| Counterpoint<br>Music 108A | 2(2-0) | Musical Form and Analysis<br>Music 109 | 2(2-0) |
| History and Appreciation of Music I<br>Music 112 | 3(3-0) | History and Appreciation of Music II<br>Music 113 | 3(3-0) |
| Public School Music I<br>Music 120 | 2(2-0) | Public School Music II<br>Music 121 | 2(2-0) |
| Public School Music III<br>Music 122 | 2(2-0) | Public School Music IV<br>Music 123 | 2(2-0) |
| Choral Society<br>Music 190A to 190 H | 1(1-0) | Choral Society<br>Music 190A to 190H | 1(1-0) |
| Orchestra<br>Music 193A to 193H | 1(1-0) | Orchestra<br>Music 193A to 193H | 1(1-0) |
| Band<br>Music 196A to 196H | 1(1-0) | Band<br>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) Community Organization Econ. 267 | 3(3-0) |
| (a) Agricultural Economics Ag. Ec. 101 | 3(3-0) | (b, c) Marketing of Farm Products Ag. Ec. 202 | 3(3-0) |
| (a) Rural Education Educ. 201 | 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) Parliamentary Procedure Pub. Spk. 125 | 2(2-0) |
| (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) |

## 25. Military Science and Tactics

| First Semester | | Second Semester | |
|---|---|---|---|
| Infantry V Mil. Tr. 109 | 3( - ) | Infantry VI Mil. Tr. 110 | 3( - ) |
| Infantry VII Mil. Tr. 111 | 3( - ) | Infantry VIII Mil. Tr. 112 | 3( - ) |

## 26. Physical Education and Athletics

| First Semester | | Second Semester | |
|---|---|---|---|
| Advanced Apparatus I Phys. Ed. 110 | 1(0-3) | Advanced Apparatus II Phys. Ed. 111 | 1(0-3) |
| Basket Ball Phys. Ed. 130 | 1(1-0) | Football Phys. Ed. 126 | 2(2-0) |
| Track and Field Sports Phys. Ed. 140 | 1(1-0) | Baseball Phys. Ed. 135 | 1(1-0) |

Additional subjects are available during the summer session.

## 27. Public Speaking

| First Semester | | Second Semester | |
|---|---|---|---|
| Oral Interpretation Pub. Spkg. 101 | 2(2-0) | Dramatic Reading Pub. Spkg. 102 | 2(2-0) |
| Argumentation and Debate Pub. Spkg. 120 | 3(3-0) | Lecture Recital Pub. Spkg. 115 | 2(2-0) |
| Parliamentary Procedure Pub. Spkg. 125 | 2(2-0) | | |
| Dramatic Production I Pub. Spkg. 130 | 2(2-0) | Dramatic Production II Pub. Spkg. 135 | 2(2-0) |
| Argumentation and Debate I Pub. Spkg. 121 | 2(2-0) | Argumentation and Debate II Pub. Spkg. 122 | 2(2-0) |

## 30. Social Science

| First Semester | | Second Semester | |
|---|---|---|---|
| American History I<br>Hist. 201 | 3(3-0) | American History II *or* III<br>Hist. 202 *or* 203 | 3(3-0) |
| American Government<br>Hist. 151 | 3(3-0) *or* | American State Government<br>Hist. 153 | 3(3-0) |
| American National Government<br>Hist. 152 | 3(3-0) | | |
| Latin America<br>Hist. 207 | 2(2-0) | | |
| English History<br>Hist. 121 | 3(3-0) | Modern Europe<br>Hist. 223 | 3(3-0) |
| Economics<br>Econ. 101 | 3(3-0) | Agricultural Economics<br>Ag. Ec. 101 | 3(3-0) |
| Business Organization<br>Econ. 106 | 1(1-0) | Money and Banking<br>Econ. 116 | 2(2-0) |
| Labor Problems<br>Econ. 233 | 2(2-0) | Public Finance<br>Econ. 213 | 2(2-0) |
| Sociology<br>Econ. 151 | 3(3-0) | Marketing of Farm Products<br>Ag. Ec. 202 | 3(3-0) |
| History of Journalism<br>Ind. Jour. 274 | 2(2-0) | Agricultural Land Problems<br>Ag. Ec. 218 | 3(3-0) |

## 31. Applied Science

| First Semester | | Second Semester | |
|---|---|---|---|
| General Botany I<br>Bot. 101 | 3(1-4, 2) | General Botany II<br>Bot. 105 | 3(1-4, 2) |
| Plant Pathology I<br>Bot. 205 | 3(1-4, 2) | Field Crop Diseases<br>Bot. 240 | 2(1-2, 1) |
| Fruit Crop Diseases<br>Bot. 202 | 2(1-2, 1) | Vegetable Diseases<br>Bot. 245 | 2(1-2, 1) |
| Farm Forestry<br>Hort. 113 | 4(3-3) | Seed Identification and Weed Control<br>Agron. 105 | 2(1-3) |
| General Zoölogy<br>Zoöl. 105 | 5(3-6) | Elements of Horticulture<br>Hort. 108 | 4(3-3) |
| Parasitology<br>Zoöl. 208 | 3(2-3) | Small Fruits<br>Hort. 110 | 2(2-0) |
| Zoölogy and Embryology (Vet.)<br>Zoöl. 109 | 5(3-6) | Gardening<br>Hort. 122 | 3(3-0) |
| Hygienic Bacteriology<br>Bact. 206 | 4(2-6) | Landscape Gardening I<br>Hort. 126 | 2(1-3) |
| General Entomology<br>Ent. 101 | 3(2-3) | General Microbiology<br>Bact. 101 | 3(1-6) |
| Horticultural Entomology<br>Ent. 201 | 2(2-0) | General Economic Entomology<br>Ent. 206 | 3(2-3) |
| Organic Chemistry (Agr.)<br>Chem. 120 | 3(2-3) | Apiculture<br>Ent. 111 | 3(2-3) |
| Chemistry of Soils and Fertilizers<br>Chem. 252A | 2(0-6) | Chemistry of Crops<br>Chem. 253A | 2(0-6) |
| Human Nutrition<br>Food and Nut. 112 | 3(3-0) | Dairy Chemistry<br>Chem. 254 | 3(1-6) |
| Household Physics<br>Physics 101 | 4(3-3) | Household Chemistry<br>Chem. 265 | 3(1-6) |
| Photography<br>Physics 120 | 2(1-3) | Meteorology<br>Physics 133 | 2(2-0) |

## 32. Home Economics

| First Semester | | Second Semester | |
|---|---|---|---|
| Household Physics<br>Physics 101 | 4(3-3) | Foods I<br>Food and Nut. 101 | 3(1-6) |
| Organic Chemistry (HE)<br>Chem. 121 | 5(3-6) | Household Microbiology<br>Bact. 121 | 5(3-6) |
| Foods II<br>Food and Nut. 106 | 5(3-6) | Dietetics<br>Food and Nut. 201 | 5(3-6) |
| Human Nutrition<br>Food and Nut. 112 | 3(3-0) | Clothing I<br>Clo. and Text. 101 | 2(1-3) |
| Clothing II<br>Clo. and Text. 111 | 3(1-6) | Costume Design I<br>Clo. and Text. 106 | 2(0-6) |
| Applied Design I<br>Ap. Art 101 | 3(1-6) | Textiles<br>Clo. and Text. 116 | 3(2-3) |
| Applied Design II<br>Ap. Art 106 | 3(1-6) | House Furnishings<br>Ap. Art. 108 | 2(1-3) |
| Interior Decoration and Furnishing<br>Ap. Art 114 | 3(1-6) | Handicraft<br>Ap. Art. 112 | 2(0-6) |
| | | Principles of Art and Their Application<br>Ap. Art 124 | 3(3-0) |

## 35. Agriculture

| First Semester | | Second Semester | |
|---|---|---|---|
| General Botany I<br>Bot. 101 | 3(1-4, 2) | General Botany II<br>Bot. 105 | 3(1-4, 2) |
| Judging Market Live Stock<br>An. Husb. 132 | 2(0-6) | Judging Breeding Live Stock<br>An. Husb. 138 | 2(0-6) |
| Elements of Dairying<br>Dairy Husb. 101 | 3(2-3) | Dairy Judging<br>Dairy Husb. 104 | 1(0-3) |
| Organic Chemistry (Agr.)<br>Chem. 120 | 3(2-3) | | |
| Plant Pathology I<br>Bot. 205 | 3(1-4, 2) | Principles of Feeding<br>An. Husb. 152 | 3(3-0) |
| Soils<br>Agron. 133 | 5(4-3) | Farm Crops<br>Agron. 109 | 5(3-6) |
| Farm Poultry Production<br>Poult. Husb. 101 | 2(1-2, 1) | Elements of Horticulture<br>Hort. 108 | 4(3-3) |

## 36. Architecture

| First Semester | | Second Semester | |
|---|---|---|---|
| Engineering Drawing<br>Mach. Design 101 | 2(0-6) | Descriptive Geometry<br>Mach. Design 106 | 2(0-6) |
| Elements of Architecture I<br>Arch. 106A | 3(0-9) | Elements of Architecture II<br>Arch. 107A | 3(0-9) |
| Perspective<br>Arch. 126 | 1(0-3) | Shades and Shadows<br>Arch. 130 | 1(1-0) |
| Object Drawing I<br>Arch. 111 | 2(0-6) | Object Drawing II<br>Arch. 114 | 2(0-6) |
| Design I<br>Arch. 142 | 3(0-9) | Design II<br>Arch. 144 | 3(0-9) |

## 37. Manual Training

| First Semester | | Second Semester | |
|---|---|---|---|
| Engineering Drawing<br>Mach. Design 101 | 2(0-6) | Engineering Woodwork I<br>Shop 101 | 1(0-3) |
| Descriptive Geometry<br>Mach. Design 158 | 2(0-6) | | |
| Woodworking for Grammar Grades<br>Shop 120 | 2(0-6) | Woodworking I for High Schools<br>Shop 125 | 2(0-6) |
| Woodworking II for High Schools<br>Shop 130 | 2(0-6) | Wood Turning<br>Shop 135 | 2(0-6) |
| Forging I<br>Shop 150 | 1(0-3) | | |
| Foundry Practice<br>Shop 160 | 1(0-3) | Pattern Making<br>Shop 145 | 1(0-3) |
| Machine Tool Work I<br>Shop 170 | 2(0-6) | Machine Tool Work II<br>Shop 192 | 2(0-6) |
| Machine Tool Work III<br>Shop 193 | 1(0-3) | Metallurgy<br>Shop 165 | 2(2-0) |
| Farm Motors<br>Ag. Engr. 125, 126 | 3(2-3) | Farm Buildings<br>Ag. Engr. 103 | 3(1-6) |
| Machine Drawing I<br>Mach. Design 161 | 2(0-6) | Surveying I<br>Civ. Engr. 102 | 2(0-6) |

## 45. Milling Industry

| First Semester | | Second Semester | |
|---|---|---|---|
| Principles of Milling<br>Mill. Ind. 101 | 1(0-3) | Milling Qualities of Wheat<br>Mill. Ind. 201 | 2(2-0) |
| Quantitative Analysis A<br>Chem. 250 | 3(1-6) | Quantitative Analysis B<br>Chem. 251 | 3(1-6) |
| Organic Chemistry (Agr.)<br>Chem. 120 | 3(2-3) | Experimental Baking A<br>Mill. Ind. 204 | 2(0-6) |
| Milling Practice I<br>Mill. Ind. 109 | 3(1-6) | Milling Practice II<br>Mill. Ind. 110 | 2(0-6) |
| Wheat and Flour Testing<br>Mill. Ind. 203 | 4(1-9) | Advanced Wheat and Flour Testing<br>Mill. Ind. 206 | x(0-3) |
| Farm Crops<br>Agron. 109 | 5(3-6) | The Chemistry of Proteins<br>Chem. 236 | 2(2-0) |
| Grain Marketing<br>Ag. Ec. 203 | 3(3-0) | | |
| Grain Grading and Judging<br>Agron. 108 | 2(0-6) | | |

# Bacteriology

Professor BUSHNELL
Professor GAINEY
Assistant Professor FAY
Instructor HINSHAW
Instructor LAFENE
Graduate Assistant BANGS

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.

This department owns equipment valued at $10,775.

## COURSES IN BACTERIOLOGY

FOR UNDERGRADUATES.

101. GENERAL MICROBIOLOGY. Sophomore or junior year, both semesters. Lectures, one hour; laboratory, six hours. Three semester credits. Prerequisite: Chemistry II (Chem. 102). Professor Gainey and Mr. Lafene.

This general introductory course consists of lectures, recitations and demonstrations covering the morphological and biological characters, the classification and 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, culturally, and biochemically. Also quantitative and qualitative examinations are made of milk, water, soil, etc. Laboratory deposit, $10.

106. AGRICULTURAL MICROBIOLOGY. Junior year, both semesters. Lectures, one hour; laboratory, six hours. Three semester credits. Prerequisite: Organic Chemistry (Chem. 120). Professor Gainey and Assistant Professor 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. Laboratory deposit, $10.

111. PATHOGENIC BACTERIOLOGY I. Sophomore year, second semester. Lectures, two hours; laboratory, six hours. Four semester credits. Prerequisite: Chemistry II (Chem. 102). Professor Bushnell and Doctor Hinshaw.

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. Laboratory deposit, $10.

116. PATHOGENIC BACTERIOLOGY II. Junior year, first semester. Lectures, two hours; laboratory, six hours. Four semester credits. Prerequisite: Pathogenic Bacteriology I. Professor Bushnell and Doctor Hinshaw.

A study is made of the morphology, powers of resistance, 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, preciptins, bacteriolysins and agglutinins.

*Laboratory.*—A study of the microscopical and cultural character of pathogenic microörganisms; laboratory animal inoculations, autopsy, and diagnosis; prevention and treatment of specific infectious diseases; experimental production of opsonins, antitoxins, agglutinins, preciptins, and cytolysins; experiments showing the constitution and mode of action of these antibodies; production of active and passive anaphylaxis; methods for the production and standardization of biological products, such as diphtheria and tetanus antitoxin, bacterins, 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. Laboratory deposit, $10.

121. HOUSEHOLD MICROBIOLOGY. Junior year, both semesters. Lectures, three hours; laboratory, six hours. Five semester credits. Prerequisite: Organic Chemistry HE (Chem. 121). Assistant Professor Fay and Mr. Lafene.

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, consisting of preparation of media, methods and principles of sterilization, incubation, plating, isolating and staining of microörganisms is first taken up. Studies 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. Laboratory deposit, $10.

FOR GRADUATES AND UNDERGRADUATES

201. Soil Microbiology. Elective, second semester. Lectures, one hour; laboratory, six hours. Three semester credits. Prerequisite: Course 101 or 106. 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. The course includes a study of the influence of depth and character of soil, temperature, moisture, chemical reaction, aëration, and other factors upon the activities of soil microörganisms; and the influence of such phenomena as ammonification, nitrification, dentrification, symbiotic and nonsymbiotic nitrogen fixation upon crop production. 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 and quantitative analysis and the laboratory study of ammonification, nitrification, dentrification, 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 and nonsymbiotic nitrogen-fixing bacteria. Laboratory deposit, $10.

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. Detailed studies are made of the manufacture, standardization, preparation and use of the various biological products related to the diagnosis, prevention and treatment of specific infectious diseases; of the theories of immunity, etc. The technic of clinical laboratory diagnosis is also carefully studied. Laboratory deposit, $10.

211. Dairy Bacteriology. Elective, second semester. Lectures, one hour; laboratory, six hours. Three semester credits. Prerequisite: General, Agricultural, or Household Microbiology. Assistant Professor 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.; and 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 sep-

arator slime; the effect of temperature on the growth of milk bacteria; pasteurization of milk; and the 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. Laboratory deposit, $10.

216. POULTRY BACTERIOLOGY. Elective, second semester. Lectures, one hour; laboratory, six hours. Three semester credits. Prerequisite: General or Agricultural Microbiology. Doctor Hinshaw.

Consideration is given to the etiology, sources, and modes of infection, prevention and cure of various microbial diseases of poultry; and to the microbial content of freshly-laid eggs, cold-storage eggs, and egg products, together with conditions tending toward increase or decrease of this microbial content.

*Laboratory.*—Microörganisms pathogenic for poultry; artificial production, diagnosis, and control of poultry diseases; and the microbial content of eggs and egg preparations produced and handled under various conditions, form the subject matter of the laboratory work. Laboratory deposit, $10.

217. POULTRY DISEASES. Senior year, second semester. Lectures, two hours. Two semester credits. Prerequisites: Pathogenic Bacteriology I and II, and Therapeutics. (Surg. and Med. 162.) Doctor Hinshaw.

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 study 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. Prerequisite: Course 101, 106, 111, or 121. Professor Bushnell and 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.

230. BACTERIOLOGY SEMINAR. Elective, both semesters. One semester credit. One hour session each week. For prerequisites consult professor in charge.

At these meetings the members of the department and the more advanced students meet for papers and discussion on all phases of current research work in bacteriology, serology, and related subjects. Graduate students in this department may be assigned to this subject for credit; all others interested may visit the meetings at any time.

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, Professor Gainey, and Assistant Professor Fay.

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 by 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*
Associate Professor HAYMAKER
Associate Professor GATES
Assistant Professor DALBEY
Assistant Professor WHITE
Instructor CASHEN
Assistant MILLER
Coöperative Assistant JOHNSTON
Graduate Assistant SCHRECK
Graduate Assistant SWALLEN

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.

The equipment owned by the department has a value of $26,482.

## COURSES IN BOTANY

### FOR UNDERGRADUATES

101. GENERAL BOTANY I. Freshman year, first semester and summer school. Class work, one hour; laboratory, six hours.† Three semester credits. Professors Melchers and Miller, Associate Professors Davis, Gates and Haymaker, Assistant Professors Dalbey and White, and Miss Cashen.

This is a course of lectures, combined with assignments in a required text and additional 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: *Textbook of General Botany,* by Holman and Robbins.

*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. Laboratory charge, $2.75.

105. GENERAL BOTANY II. Freshman year, second semester and summer school. Class work, one hour; laboratory, six hours.† Three semester credits. Professor Melchers, Associate Professors Davis, Gates, and Haymaker, Assistant Professors Dalbey and White, and Miss Cashen.

The lectures are designed to give the students a general knowledge of some of the more important botanical facts and discoveries, with their application to closely related sciences and to human welfare. The significance of bacteria,

* Absent on leave, year 1924-'25.

† Two of the required laboratory hours are employed in lecture and laboratory quizzes and reviews.

fungi, and other microörganisms in our daily life; the more important laws governing plants in relation to their environment; fundamental laws and facts of genetics and plant breeding; the theories of evolution; and general phenomena of plant life, are discussed. Text: *Textbook of General Botany,* by Holman and Robbins.

*Laboratory.*—The aim of the laboratory work is to give students a general knowledge of plants as to form, structure, habits, adaptations and relationships to other organisms. Wherever possible, the plants are studied as they actually occur in nature. The work covers a study of the morphology of the typical representatives of the great groups of the plant kingdom, the ecological factors affecting plants, and their identification under both winter and summer conditions by the use of an identification key. Laboratory outlines are furnished by the department. Laboratory charge, $2.75.

126. MEDICAL BOTANY. Sophomore year, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: High-school botany or its equivalent. Associate 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 eliminations.

*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 identification of these plants by means of a descriptive key. Laboratory charge, $1.50.

130. PLANT PHYSIOLOGY I. Sophomore year and elective, first semester. Class work, three hours. Three semester credits. Prerequisite: General Botany I and II, and Chemistry I and 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.

155. FIELD BOTANY. Summer School. By appointment. Class, field, laboratory and library work, ten hours.** Three semester credits. Associate Professor Haymaker.

The purpose of the course is to offer teachers an opportunity to become acquainted with plants in the field, their natural history, habits, distribution and relation to their environment. Excursions are made to different localities near Manhattan to study plants of the prairies, woods, swamps, streams, etc. Special attention is given to methods of collecting and preserving plants for use in high-school teaching. Part of the laboratory work consists in the determination of the names of plants by means of manuals. Text: Gray's *New Manual of Botany.*

160. SPECIAL METHODS IN THE TEACHING OF BOTANY. Summer School. Class work, lectures and laboratory, ten hours. Three semester credits. Associate Professor Haymaker.

A study is made of typical phases of botany that should be taught to high-school students to serve them either as a foundation for additional biological subjects in college or as a cultural foundation for the fuller appreciation of the interesting facts and phenomena of plant life. Laboratory exercises correlating the subject matter in the state text are prepared by the students themselves and are criticized and graded by members of the class. The practice of

** Four of the required laboratory hours are employed in lecture and laboratory quizzes and reviews.

developing exercises, collecting the required material, and setting up any necessary apparatus is emphasized. Methods of presenting the subject matter in a way to develope the interest and the investigational nature of students of high-school age are stressed. Text: Transeau's *Science of Plant Life*. Laboratory charge, $1.50.

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. Associate 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 organism causing the disease. The course is especially valuable for those studying horticulture or those expecting to specialize in plant pathology. Laboratory charge, $2.

204. MYCOLOGY I. Elective, first semester. Class work, two hours; laboratory, six hours.* Four semester credits. Prerequisite: Plant Pathology I. Assistant Professor 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 it is not required. Laboratory charge, $5.

205. PLANT PATHOLOGY I (*or* ECONOMIC PLANT DISEASES). Junior year, first semester and summer school. Class work, one hour; laboratory, six hours.* Three semester credits. Prerequisite: General Botany I and II. Professor Melchers, Associate Professor Haymaker, and Assistant Professor 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. Laboratory charge, $2.50.

206. MYCOLOGY II. Elective, second semester. Class work, one hour; laboratory six to twelve hours.* Three to five semester credits. Prerequisite: Mycology I. Assistant Professor White.

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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 course is a continuation of Mycology I, designed especially for students who wish to specialize in plant pathology. The class work consists of a series of lectures on the phylogeny of the fungi, cryptogamic herbaria, exsiccatæ, etc. The laboratory work consists chiefly in the collection and determination of fungi, in conjunction with a minor mycological problem. Laboratory charge, $5.

209. PLANT PHYSIOLOGY II. Elective, second semester. Laboratory work, six hours.* Two semester credits. Prerequisite: Plant Physiology I. Not offered in 1924-'25. Professor Miller and Associate Professor Davis.

This course is supplementary to Plant Physiology I, and is planned to give a knowledge of the methods used in obtaining experimental data in regard to the more common functions of plants. The course is of interest to students who intend to teach botanical subjects or who expect to carry on experimental work with plants. Laboratory charge, $5.

215. PLANT HISTOLOGY. Elective, second semester. Laboratory, six hours. Two semester credits. Prerequisite: General Botany I or II. Assistant Professor 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*. Laboratory charge, $3.50.

220. BOTANICAL SEMINAR. Elective, both semesters. One hour session each week. One semester credit. For prerequisites consult professor in charge.

This 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 semester. Class work, one hour; laboratory, six hours.* Three semester credits. Prerequisite: General Botany I and II. Associate Professor Gates.

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. Laboratory charge, $2.

228. PLANT ECOLOGY. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: General Botany I and II. (Omitted in 1924.) Associate 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. Laboratory charge, $1.50.

230. PHYSIOLOGICAL PHENOMENA IN THE GERMINATION OF SEEDS. Elective. first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: General Botany I and 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

* Two of the required laboratory hours are employed in lecture and laboratory quizzes and reviews.

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, seed houses, etc. Laboratory charge, $2.50.

232. BOTANICAL PROBLEMS. Elective, both semesters and summer school. From one to five semester credits. Prerequisites: General Botany I and II, and approval by the head of the department. Professors Melchers and Miller, Associate Professors Davis, Gates, and Haymaker, Assistant Professors Dalbey and White, and Miss Cashen.

In some instances a student may wish to pursue a special field of work which is not definitely represented by one of the undergraduate elective courses listed. Such a course may be arranged for upon consultation with the instructor. Laboratory charge, $2.50.

234. PHYTOGEOGRAPHY. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: General Botany I and II. Not offered in 1924-'25. Associate Professor Gates.

The class work consists of a series of lectures dealing with the distribution and characteristics of vegetation.

236. MORPHOLOGY OF PLANTS. Elective, second semester. Laboratory and lecture, six hours.* Two semester credits. Prerequisite: Botany I or Botany II. Not offered in 1924-'25. Assistant Professor Dalbey.

This is a general course in the morphology of plants. It is designed to give biological students a broad view of the morphology and the relationship of the important groups of plants.

*Laboratory.*—A careful study is made of living material, in conjunction with prepared slides of the morphology of the representative types of the chief groups of the plant kingdom. Plant types are studied in the order of their relative complexity and specialization, emphasis being given to the relationship in an evolutionary series. Special attention is given to the morphology of the fungi. Laboratory charge, $3.

240. FIELD-CROP DISEASES. Elective, second semester. Class work, one hour; laboratory, three hours.† Two semester credits. Prerequisite: Plant Pathology I. Professor Melchers.

The class work consists of a series of lectures dealing with the historical development of phytopathology and a series of lectures considering the various factors entering into the problem of disease resistance in plants. Breeding for resistance is given consideration and the most important literature on the subject is discussed.

*Laboratory.*—This consists of a detailed microscopic and symptom study of the fungous, bacterial, and nonparasitic plant diseases attacking cereal and forage crops, other than those considered in Plant Pathology I. All the literature pertaining to these diseases is reviewed, and detailed notes are required as part of the laboratory work. A major paper is required on some subject pertaining to breeding for disease resistance in cereals or forage crops. The course is of value to those who wish to pursue agronomic work, or for those expecting to specialize in plant pathology. Laboratory charge, $2.

245. VEGETABLE DISEASES. Elective, second semester. Class work, one hour laboratory, three hours.† Two semester credits. Prerequisite: Plant Pathology I. Not offered in 1924-'25. Professor Melchers.

The class work consists of a series of lectures dealing with the problem of disease resistance in plants. Breeding for disease resistance is considered and the progress that has been made in vegetables is discussed. The most important literature bearing on the subject is reviewed.

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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.

*Laboratory.*—This consists of a detailed microscopic and symptom study of the fungous, bacterial, nonparasitic and degenerative diseases attacking vegetables. All literature pertaining to these diseases is reviewed and notes are required as part of the laboratory work. A major paper is required on some subject pertaining to breeding for disease resistance in vegetables. This course is of special value to students in horticulture, or for those expecting to specialize in plant pathology. Laboratory charge, $2.

265. LITERATURE OF BOTANY. Elective, both semesters. Class work, one hour. One semester credit. Prerequisites: General Botany I and II, Plant Pathology I. Associate Professor Haymaker.

The aims in the course are as follows: (1) To become acquainted with the more important sources of botanical literature, including the texts, monographs, etc., of noted authors; (2) to study the periodicals containing articles relating to botany, noting the types of articles accepted by each, the presentation of subject matter, etc.; (3) to learn to use the publications containing citations and abstracts of papers, by preparing bibliographies covering assigned problems; (4) to become acquainted with the work of modern botanists by reviewing the articles appearing in current periodicals, experiment station reports, etc. Class work consists of recitations, the presentation of reports, and the preparation of a semester paper covering a problem of importance. The course is designed particularly for those students who are preparing to take advanced work in botany. Graduate students majoring in botany are expected to take this course. Those taking the work the first semester may continue the course for credit the second semester.

FOR GRADUATES

301A. PLANT PATHOLOGY III. Elective, second semester. Class work, one hour; laboratory, six hours.* Three semester credits. Prerequisite: Mycology I. Not offered in 1924-'25. Assistant Professor White.

This course is one in phytopathological technic. 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. Considerable attention is devoted to the preparation of various kinds of culture media, isolation and culture of pathogenic organisms, nutrition of fungi, studies in enzyme secretion and action, micrometry, incubation and infection phenomena, etc. The course is especially designed for those who intend to pursue plant pathology as a profession, either as teachers or investigators in experiment stations. Laboratory outlines are furnished by the department. No special text will be required. Laboratory charge, $4.

302. PLANT PATHOLOGY IV. Elective, first and second semester and summer school. Laboratory, nine hours.* Three semester credits. Prerequisite: Plant Pathology III. Professor Melchers and Assistant Professor White.

This course involves original research. Problems are chosen by the student along some lines in which he is interested. A careful worked-out report which summarizes the investigation undertaken is required at the end of the semester. Laboratory charge, $2.

308. INVESTIGATIONS IN PLANT TAXOMONY AND PLANT ECOLOGY. Elective, first and second semesters. Laboratory work, including conferences and field work, from six to twenty-four hours. From two to eight semester credits. Associate Professor Gates.

Graduate students and especially qualified undergraduates are admitted to this course 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. Laboratory charge, $2.

* Two of the required laboratory hours are employed in lecture and laboratory quizzes and reviews.

310. RESEARCH IN BOTANY. Elective, both semester and summer school. From one to twelve semester credits. Professors Melchers and Miller, Associate Professors Davis, Gates and Haymaker, Assistant Professors Dalbey and White, and Miss Cashen.

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. Laboratory charge, $3.

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# Chemistry

Professor KING
Dean WILLARD
Professor HUGHES
Professor BRUBAKER
Associate Professor COLVER
Associate Professor TAGUE
Assistant Professor LATSHAW
Assistant Professor VAN WINKLE
Assistant Professor HALL
Assistant Professor KEITH
Assistant Professor PERKINS
Instructor HARRISS
Instructor BRUNER
Instructor SELLERS
Instructor LASH
Instructor WAMPLER
Instructor JOSEPH
Instructor KUERNER
Instructor MASSENGALE
Instructor PALMER
Instructor MARCY
Instructor TEMPLETON
Associate Food Analyst DE ROSE

All of the industries are becoming more and more dependent for their highest success upon intelligent application of the physical and biological 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.

The Department of Chemistry possesses equipment valued at $65,716.

## COURSES IN CHEMISTRY

FOR UNDERGRADUATES

101. CHEMISTRY I. Freshman year, both semester and summer school. Lectures and recitations, three hours; laboratory, six hours. Five semester credits. Prerequisite: High-school Physics. Professor King, Assistant Professor Keith, Miss Harriss, Miss Bruner, Mr. Sellers, Mr. Lash, Mr. Wampler, Mr. Marcy, Mr. Massengale, and Mr. Templeton.

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. Laboratory deposit, $10.

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 a *Qualitative Analysis,* by Baskerville and Curtman.

*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. Laboratory deposit, $10.

105. CHEMISTRY (VET.). Freshman year, both semesters. Lectures and recitations, three hours; laboratory, six hours. Five semester credits. Mr. Wampler.

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. Laboratory deposit, $10.

106. ORGANIC CHEMISTRY (VET.). Freshman year, second semester. Lectures and recitations, three hours; laboratory, six hours. Five semester credits. Prerequisite: Chemistry (Vet.). Mr. Palmer.

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.

*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. Laboratory deposit, $10.

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. Prerequisite: High-school physics. Professor King, Assistant Professor Van Winkle, Mr. Joseph, Mr. Kuerner, and Mr. Templeton.

These courses cover the work of general chemistry and qualitative analyses. During the first semester the entire time is devoted to general chemistry, while during the second semester the time is divided between general chemistry and qualitative analyses; the majority of the lectures and all of the recitations being given over to general chemistry, while a few of the lectures and all of the laboratory time are devoted to qualitative analyses. In all courses emphasis is placed upon those fundamental principles of chemistry which have a special bearing upon engineering and engineering materials. Text: Deming's *General Chemistry.*

*Laboratory.*—During the first semester the experimental work covers the topics taken up in the lectures and recitations. Text: *A Combination Laboratory Manual and Notebook,* by W. A. Van Winkle.

During the second semester the time is devoted to qualitative analysis. After a systematic study of the chemistry of the more common metals and acids a study of the analysis of alloys, minerals and ores is taken up. Text: *Outline of the Methods of Qualitative Chemical Analysis,* by R. J. Carney, supplemented by mimeographed notes. Laboratory deposit, $7.50.

110. GENERAL CHEMISTRY. First semester. Lectures and recitations, three hours; laboratory, six hours. Five semester credits. Prerequisite: High-school Physics. Professor King and Mr. Wampler.

This course is designed to give those students not taking additional chemistry a general knowledge of some of the principal laws and theories of the science, as well as the preparation, properties, and uses of some of the important metallic and nonmetallic substances. It will serve as a prerequisite for subjects not requiring an extended knowledge of chemistry, and as a means of furnishing a reading knowledge to those who do not expect to specialize in physical science.

*Laboratory.*—The work in the laboratory is arranged to parallel that of the lecture and recitation. It includes the actual preparation and study of the properties of many of the elements and compounds mentioned in lecture. Applications of some of the laws are also made. Laboratory deposit, $10.

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. Palmer.

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. Laboratory deposit, $7.50.

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. Palmer.

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. Laboratory deposit, $10.

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.

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. Laboratory deposit, $10.

203 and 204. INDUSTRIAL CHEMISTRY I AND II. Senior year and elective, first and second semesters, respectively. Offered in 1923-'24 and alternate years thereafter. Class work, three hours; laboratory, six hours. Five semester credits each semester. Prerequisite: Organic Chemistry. 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. Laboratory deposit, $10.

205. INDUSTRIAL ELECTROCHEMISTRY. Junior year and elective, second semester. Offered when there is a sufficiently large demand. Class work, two hours. Two semester credits. Prerequisite: College courses in general chemistry and physics. 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. Prerequisites: 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. Laboratory deposit, $10.

207. ADVANCED INORGANIC CHEMISTRY. Sophomore year and elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Chemistry II or Chemistry HE-II. Assistant Professor Keith.

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 (Chem. 206). 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.

213. COLLOIDAL CHEMISTRY. Elective and graduate, second semester; given when requested by a sufficient number. Lectures, two hours. Two semester credits. Prerequisite: Physical Chemistry (Chem. 206). Professor King.

This course is designed to briefly cover the field of colloidal phenomena. It includes suspensoids and emulsoids, optical and electrical properties of colloids, Brownian movement, action of electrolytes on colloids, adsorption and surface phenomena, and a short review of the method for the preparation of colloids.

215. CHEMICAL THERMODYNAMICS. Elective, second semester, when requested by a sufficient number. Lectures and assigned readings, three hours. Three semester credits. Prerequisites: Approved courses in Physical Chemistry and Calculus. Assistant Professor Keith.

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's *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. Laboratory deposit, $10.

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*. Laboratory deposit, $10.

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. Laboratory deposit, $10.

224. QUALITATIVE ORGANIC ANALYSIS. Elective, second 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. Laboratory guide: Kamm's *Qualitative Organic Analysis*. Laboratory deposit, $10.

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 acids.

228. SPECIAL REACTIONS OF ORGANIC COMPOUNDS. For graduate and advanced students in chemistry, first semester. Given when requested by a sufficient number. Lectures, two hours. Two semester credits. Prerequisite: Organic Chemistry II. Associate Professor Colver.

This course consists of lectures and assigned readings dealing with some of the less common reactions which take place with certain aliphatic and aromatic compounds.

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*. Laboratory deposit, $10.

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. Laboratory deposit, $10.

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. Laboratory deposit, $10.

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. Laboratory deposit, $10.

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, anæmia, tuberculosis, dyspepsia, typhoid fever, jaundice, nephritis, diabetes, gout, rheumatism, intoxication.

236A. THE CHEMISTRY OF THE PROTEINS. Elective and graduate, first semester; given when requested by a sufficient number. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: An approved course in organic chemistry. Associate Professor Tague.

This course consists of a study of the chemistry of the proteins, particularly as regards their sources, isolation, purification and uses, together with their derivatives and degradation products. Laboratory deposit, $7.50.

238. CHEMISTRY OF ENZYME ACTION. Elective and graduate, first semester. Lectures, two hours. Two semester credits. Prerequisite: Physical Chemistry. Professor Hughes.

A brief review of catalysis is made, and this is followed by a study of the physical and chemical properties of enzyme preparations and the reactions catalyzed by them. The work of this course is adapted particularly to students in biology.

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. Professor Brubaker.

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. Laboratory deposit, $10.

241. QUANTITATIVE ANALYSIS. Sophomore year, second semester. Class work, one hour; laboratory, twelve hours. Five semester credits. Prerequisite: Chemistry II or its equivalent. 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. Laboratory deposit, $10.

242. FIRE ASSAYING. Junior year, first semester. Laboratory work, six hours. Two semester credits. Prerequisite: Quantitative Analysis. 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. Laboratory deposit, $10.

243. GAS ANALYSIS. Junior year, first semester. Laboratory work, three hours. One semester credit. Prerequisite: Quantitative Analysis. 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. Laboratory deposit, $7.50.

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. 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. Laboratory deposit, $7.50.

250. QUANTITATIVE ANALYSIS A. Elective and graduate, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Chemistry II. 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. Laboratory deposit, $10.

251. QUANTITATIVE ANALYSIS B. Elective and graduate, second semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: Quantitative Analysis A. Professor Brubaker.

This course covers the general procedures used in volumetric analysis, including 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. Laboratory deposit, $10.

252A. CHEMISTRY OF SOILS AND FERTILIZERS. Senior year, first semester. Laboratory, six hours. Two semester credits. Prerequisite: Quantitative Analysis I or equivalent. Assistant Professor Perkins.

This course is planned to give the student a knowledge of the most important chemical methods used in the analysis and investigations of soils and fertilizers. Laboratory deposit, $10.

253A. CHEMISTRY OF CROPS. Senior year, second semester. Laboratory, six hours. Two semester credits. Prerequisites: Organic Chemistry and Quantitative Analysis I, or equivalent. Assistant Professor Perkins.

This course takes up the most important chemical methods used in the analysis and investigations of substances present in plants and plant products. Laboratory deposit, $10.

254. DAIRY CHEMISTRY. Elective and graduate, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisites: Organic Chemistry, and Quantitative Analysis A (Chem. 250). Associate Professor Tague.

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 effected 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. Laboratory deposit, $10.

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 reading 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 A. 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. Laboratory deposit, $10.

260. ADVANCED QUANTITATIVE ANALYSIS. Junior year and elective, first semester. One credit for each three hours of laboratory work. Prerequisites: Quantitative Analysis A and B. 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. Laboratory deposit, $10.

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. 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. Laboratory deposit, $10.

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 theses in the Department of Chemistry are assigned to this course. Work is offered in the following lines:

*Agricultural Chemistry.* Professor King and Assistant Professors Latshaw and Perkins.

*Analytical Chemistry.* Professor Brubaker and Assistant Professor Latshaw.

*Organic Chemistry.* Associate Professor Colver.

*Biochemistry.* Professor Hughes and Associate Professor Tague.

*General and Physical Chemistry.* Professor King and Assistant Professors Hall and Keith.

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# Economics and Sociology

Professor KAMMEYER
Professor BURR
Assistant Professor ANDERSON
Instructor SPURRIER

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.

The department owns equipment valued at $633.

## COURSES IN ECONOMICS

FOR UNDERGRADUATES

101. ECONOMICS. Junior and senior years, both semesters and summer school. Class work, three hours. Three semester credits. Professor Kammeyer, and Assistant Professor Anderson.

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, factors 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. Text: Ely's *Outlines of Economics.*

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. Text: Lansburgh's *Industrial Management.*

116. MONEY AND BANKING. Elective, both semesters and summer school. Class work, two hours. Two semester credits. Prerequisite: Economics. Professor Kammeyer and Assistant Professor Anderson.

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, monometalism, bimetalism, 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 institutional forms of credit. Text: Holdworth's *Money and Banking.*

121. ECONOMIC GEOGRAPHY. Elective, first semester and summer school. Class work, three hours. Three semester credits. Prerequisite: Economics. Assistant Professor Anderson.

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. Text: Whitbeck and Finch's *Economic Geography.*

126. BUSINESS MANAGEMENT. Elective, both semesters and summer school. Class work, two hours. Two semester credits. Prerequisite: Economics. Not open for credit to students who have taken course 106. Professor Kammeyer and Mr. Spurrier.

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. Text: Jones's *Administration of Industrial Enterprises.*

131. COST ACCOUNTING. Junior year and elective, first semester and summer school. Class work, two hours. Two semester credits. Assistant Professor Anderson.

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. Text: Castenholz's *Cost Accounting Procedure.*

FOR GRADUATES AND UNDERGRADUATES

213. PUBLIC FINANCE. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Economics. Assistant Professor Anderson.

This course embraces a study of public revenues and expenditures; financial administration of government; financing emergencies; the historical develop-

ment of revenue systems; public indebtedness; budgets; proposed reforms in local, state, and national taxation, and recent tendencies in the direction of reform, with special reference to the United States. The shifting and incidence of taxes is also made a subject of study. The aim is to give the student a knowledge of past and existing revenue systems, especially in the United States, and to acquaint him with the fundamental principles of the science of public finance. Text: Hunter's *Outlines of Public Finance.*

229. TRANSPORTATION PROBLEMS. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Economics. Assistant Professor Anderson.

After a brief review of the development of transportation and a survey of railroad organization, this course constitutes especially a study of railroad transportation from the standpoint of rates and their regulations in the United States. Conditions of competition in the railroad industry; discriminations in rate making, both justifiable and unjustifiable, and pooling agreements, are subjects of special study. The need for governmental supervision of the industry, and the establishment and work of the Interstate Commerce Commission are studied. Actual cases of discriminations in rates which have been tried by the Interstate Commerce Commission are considered in order to bring out the development of the policy of the Interstate Commerce Commission, as well as to trace the increasing importance and power of the commission in the railroad industry. Text: Jones's *Principles of Railway Transportation.*

233. LABOR PROBLEMS. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Economics, or Sociology. Professor Burr.

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. Text: Watkins' *Labor Problems.*

240. INSURANCE. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Economics. Mr. Spurrier.

This is a course in the fundamentals of insurance. Types of insurance organizations and of insurance policies are studied. The field covered includes life insurance in all its forms; accident and health insurance; liability and compensation insurance; fire insurance; marine insurance; and other forms of casualty insurance of comparatively recent development, such as automobile, title, and credit insurance, and corporate bonding. The purpose of the course is to promote more intelligent buying of insurance; a wider recognition of the necessity of insurance education in the training of prospective business men; and to offer preparatory training to those who expect to take up insurance as a profession. Instruction is based on Riegel and Loman's *Insurance Principles and Practice* which is used as a text.

245. MARKETING PRACTICE. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Economics. Mr. Spurrier.

This course begins with a consideration of marketing functions, such as assembling and grading of products, storing, transportation, financing and risk taking, stimulation of demand, and merchandising. Following this is a study of marketing agencies and methods by means of which products are moved from producer to consumer. This involves the selection of marketing channels and other media of distribution such as the jobber, organized exchanges, and coöperative marketing. Consideration is given also to basic marketing systems and to retailing as carried on by department, specialty, and chain stores, and mail-order houses. The course concludes with a study of marketing problems of the individual business; prices and price policies, sales planning and management, salesmanship and advertising campaigns. Text: White and Hayward's *Marketing Practice.*

FOR GRADUATES

301. RESEARCH IN ECONOMICS. Elective, both semesters and summer school. Credit and hours arranged in conference with head of the department. Prerequisites: Such courses as the problem undertaken may require. Professor Kammeyer, Assistant Professor Anderson and Mr. Spurrier.

Graduate students who enroll in this course may elect for original investigation any acceptable problem in the general field of economics.

## COURSES IN SOCIOLOGY

FOR UNDERGRADUATES

151. SOCIOLOGY. Elective, both semesters and summer school. 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. 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: Gillette's *Rural Sociology*.

FOR GRADUATES AND UNDERGRADUATES

257. SOCIAL PROBLEMS. Elective, both semesters and summer school. 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 attention 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.

267. COMMUNITY ORGANIZATION. Elective, both semesters and summer school. Class work, three hours. Three semester credits. Prerequisite: Sociology. Professor Burr.

A study in detail is made of organizations now working in the community field on a rural, civic, county, state, and national basis. The work is considered from the standpoint of local economic and social development. The functions of the local 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 guided in a study of his own community on a functional basis. About one-third of the course will consist of a series of lectures on rural leadership. The course is especially adapted to the needs of county agents, home demonstration agents, welfare officers, county health nurses, and the like. Instruction is given by means of class discussions, library work, and lectures. Text: Burr's *Rural Organization.*

270. ADVANCED RURAL SOCIOLOGY. Elective. By appointment. Three semester credits. Prerequisite: Rural Sociology. Professor Burr.

This course is a continuation of Rural Sociology and includes a wide field of reading in the literature of rural life. Original research work is carried out and a thesis is prepared.

275. ECONOMIC AND SOCIAL SURVEYS. Elective. By appointment. Credit and hours of work arranged in consultation with the head of the department. Prerequisite: Economics or Sociology. Professor Burr.

Communities are surveyed for the assembling of facts concerning trade, communication and transportation, church activities, school conditions, etc. The course includes reading, field research work, and the preparation of a thesis.

FOR GRADUATES

351. RESEARCH IN SOCIOLOGY. Elective, both semesters and summer school. Credit and hours of work arranged in consultation with the head of the department. Prerequisites: Such courses as the problem undertaken may require. Professor Burr.

Graduate students who enroll in this course may elect for original investigation any acceptable problem in the field of sociology.

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# Education

Professor HOLTON
Professor WILLIAMS
Professor ANDREWS
Professor PETERSON
Professor STRICKLAND
Associate Professor WILLIAMSON
Associate Professor BRAINARD
Associate 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 technic and skill in school management and the organization of the subject matter of the curricula. All courses are based upon the proposition that education supported by public taxation should function in social and vocational efficiency. The department possesses equipment valued at $2,456.

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 or Methods, three in Educational Administration, and three in Educational Psychology. (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 Languages.*—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 its 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 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.

      Not more than nine semester hours of education will be accepted on transcripts showing only sixty hours of credit.
   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 Psychology, 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 Psychology, three in Vocational 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 psychology. 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. Associate Professor Brainard.

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. Associate Professor Brainard.

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 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. Limited to juniors, seniors and postgraduate students. Required for state life certificate. Professor Andrews.

This course is a study of the organization of state, city, and county school systems. The rural schools of Kansas are given special consideration. The responsibilities and duties of boards of education, superintendents, principals and teachers, the community and civic organizations are carefully considered. The school law of Kansas, as defined by statute and judicial interpretation, is an important part of the course.

106. EDUCATIONAL ADMINISTRATION B. Elective, first or second semester. Class work, three hours. Three semester credits. Limited to juniors, seniors and postgraduate students. Professor Williams.

This course is similar to course 105 in that it discusses 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, home-making, and trades and industry. Students preparing to teach these subjects should take this course rather than course 105.

107. SCHOOL MANAGEMENT. Elective, first or second semester. Class work, three hours. Three semester credits. Required for state elementary certificate, and for the certificate in music. Limited to freshmen and sophomores. Professor Andrews.

This course comprises a survey of classroom and school administration and the management of pupils in groups. Problems of discipline, school sanitation and hygiene and school health, and general classroom efficiency are considered. The student is shown how to develop an efficient classroom routine and class program.

109. EDUCATIONAL PSYCHOLOGY. Elective, first or second semester, junior or senior years. Class work, three hours. Three semester credits. Prerequisite: General Psychology. Professor Strickland.

This course deals with the native equipment of human beings which serves as a basis of education, the interpretation of data concerning such human characteristics, and the psychology of learning.

111. METHODS OF TEACHING A. Elective, second semester, sophomore year. Class work, three hours. Three semester credits. Professor Strickland.

This course is designed particularly for those who wish to teach in grades and junior high schools on the two-year certificate. It deals with the problems of subject matter, its presentation, classroom organization, and procedure. Some attention is given to the practical application of psychology to the teaching process.

112. METHODS OF TEACHING B. Elective, first and second semesters, junior and senior years. Class work, three hours. Three semester credits. Prerequisite: General Psychology. Professor Strickland.

This course is for those who expect to teach upon completion of a four-year college course. It deals from the standpoint of administration and high-school teaching with the problems of subject matter, its presentation, and classroom organization and procedure. Particular attention is given to the practical application of psychology to the teaching process.

113. HISTORY OF EDUCATION A. Elective, first or second semester. Class work, three hours. Three semester credits. Professor Andrews.

This course attempts an outline survey of the development of educational institutions and practices in Europe and America. Institutional history rather than educational theory is emphasized. An effort is made to present the history of education as a conscious evolution of society.

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.

125. VOCATIONAL EDUCATION A. 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 agriculture, home economics, manual training or industrial subjects. Prerequisite: Educational Administration. Professor Williams.

A comparative study is made of the provisions for the different phases of vocational education in Kansas and other states and countries, and of the principles underlying such education. The relation of vocational education to the community, county, state, and nation, and the part to be played by each in its development is emphasized. Types of schools, courses of study, adjustment of school work to community needs, and the equipment and administration of the differing vocational schools and classes are studied. The aim of the course is to fit the student to plan, teach and administer or supervise vocational work, especially in high schools. The plans and requirements of the state and federal boards for vocational schools and classes are carefully studied.

132. SPECIAL METHODS IN THE TEACHING OF HOME ECONOMICS. Elective, first or second semester. Class work, three hours. Three semester credits. Required of all candidates for the state vocational home-making certificate, and expected of all candidates for the state teachers' certificate who are preparing to teach either vocational home-making or general home economics. Prerequisites: Foods I and II, Clothing I and II, and Psychology. Associate Professor Williamson.

This course applies the principles of teaching to the selection and development of home-economics subject matter in lessons for all types of pupils and to the conduct of laboratory and classroom exercises. The handling of the school and home projects is particularly stressed.

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. Associate Professor Davidson.

Training in planning lessons, organizing materials, and conducting class, laboratory, and field instruction work in vocational agriculture is the purpose of this course. The work includes observation, criticism, and reports of class work done in high schools visited; outlining the agricultural course, determining content material for the enterprises included, arranging in seasonal sequence, and planning procedure in presentation of subject matter. Special attention is given to the selection of equipment, apparatus, and materials suitable for properly establishing and conducting a vocational agricultural department. The project in its various phases is studied from standpoint of aim, planning,

supervision, correlation with class work, records, and evaluation. Consideration is given methods of stimulating, supervising, and evaluating home practice work. Such subjects as the community survey, prevocational work, agricultural clubs, community fairs, agricultural library, and departmental records are given careful study.

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. Prerequisite: 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 and Associate Professor Rice.

(See Department of English, course 134.)

160. SUPERVISED TEACHING IN HOME ECONOMICS. Elective, first or second semester. Three semester credits. Limited enrollment. Prerequisites: Foods I and II, Clothing I and II. Prerequisite or parallel: Special Methods in the Teaching of Home Economics. Associate Professor Williamson.

This course is required of all those qualifying to teach vocational homemaking and is urged upon those who are qualifying for the state teachers' certificate for teaching general home economics. Supervised teaching is carried on in the sewing and cooking 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 teacher's certificate who are preparing to teach agriculture. Prerequisites: Educational Psychology, and Special Methods in the Teaching of Agriculture. Associate Professor Davidson.

Students expecting to teach are required to do three weeks observation and practice teaching in vocational agricultural classes in the Manhattan high school, and other rural high schools by arrangement. In addition, one class period through the semester is required for group study of classroom problems. Double supervision by the College instructor and vocational teacher in the practice department is given. Both instructors 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, and Special Methods in the Teaching of Industrial Arts Subjects. Professor Williams.

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.

163. SUPERVISED TEACHING AND OBSERVATION IN SCIENCE. Elective, first semester, juniors or seniors. Three semester credits. Prerequisites: Methods of Teaching or Educational Psychology and at least ten hours of college credit in the science to be taught. Professor Strickland.

This course is designed for those preparing to teach science in high schools. Three weeks observation and practice teaching in a science are required. In addition, one class period through the semester is devoted to a group study of lesson plans, special methods and devices, organizations of courses, etc.

FOR GRADUATES AND UNDERGRADUATES

201. RURAL EDUCATION. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Educational Administration. 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, farmers' 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.

208. THE PSYCHOLOGY OF CHILDHOOD AND ADOLESCENCE. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Psychology A, B, C, or D. Professor Peterson, Associate Professor Brainard.

The purpose of this course is to give a clearer understanding of the interests and activities of childhood and adolescence, with an appreciation of their significance for learning and for the development of those habits, attitudes, purposes, and standards of conduct which constitute character. The course includes a study of the following topics: norms of physical development, inherited traits, habit formation, the learning process, play, the social instincts of childhood and adolescence, and the development of intelligence and morality.

211. MENTAL MEASUREMENTS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Psychology. Professor Peterson.

This course deals with the methods and devices employed and the more significant results so far obtained in the measure of mental alertness, special aptitudes, and character traits. It includes a study of the values and limitations of mental measurements in meeting some of the crucial problems of vocational and educational guidance, classification and promotion in the schools, segregation and treatment of mental defectives and delinquents, employment, immigration, racial antipathy, etc. Each student has an opportunity to obtain practical experience in giving tests and in the statistical evaluation and interpretation of results.

212. EDUCATIONAL TESTS AND MEASUREMENTS. First semester. Class work, three hours. Three semester credits. Prerequisites: General Psychology, and Educational Psychology. Professor Strickland.

This course is a study of the problems of measuring achievement as distinguished from intelligence testing. The values of tests as teaching tools, the errors to be avoided, the technique of constructing and using standardized and objective tests, and the interpretation of results are given consideration.

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 PSYCHOLOGY. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Psychology. Professor Peterson.

The fundamental problems, methods, and interpretations of general psychology are studied critically in this course.

217. EXPERIMENTAL PSYCHOLOGY. Elective, first or second semester. Class work, three hours. Three semester credits. Prerequisite: Advanced 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 in the experimental analysis of the thought processes. Approximately half the time is devoted to laboratory work.

219. THE CURRICULUM. Elective, first or second semester. Class work, three hours. Three semester credits. Limited to juniors, seniors, and postgraduate students. Professor Andrews.

An attempt is made in this course to discover the fundamental requirements of our modern life upon the schools. A search is made for educational objectives in the light of the above requirements and a catalogue of these objectives is attempted. Each subject in the curriculum is examined for its minimum essentials both in the elementary school and the high school. The course proceeds through readings, research on community problems, and lectures.

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.

223. STATISTICAL METHODS APPLIED TO EDUCATION. Elective. Class work, three hours. Three semester credits. Professor Andrews.

The aims of the course are: (1) to organize material and data of educational experience and research for statistical interpretation; (2) to develop skill and confidence in the use of statistical methods; (3) to provide discussions and interpretations of statistical methods employed in scientific studies in education; (4) to give experience in the computation of statistical constants and to develop the ability of graphical representation and interpretation.

226. VOCATIONAL EDUCATION B. Elective, second semester and summer school. Class work, three hours. Three semester credits. Professor Williams.

An intensive study is made of the administration and supervision of the different fields of vocational education, including agriculture, home-making, trade and industrial and commercial education. A study of curricula and curriculum building in the different vocational fields in relation to community needs is emphasized.

The work consists of lectures, reports, and class discussions. Each student is required to choose a project and to carry on special investigation in his chosen field.

230. VOCATIONAL GUIDANCE. Elective, first or second semester, and summer school. Class work, two hours. Two semester credits. Prerequisites: Educational Administration, Psychology, and Vocational Education. Professor Williams.

This course is designed for those preparing to teach in junior or senior high schools in vocational or prevocational subjects. The aim of the course is twofold: first, to put the student in touch with the best methods and practices now used in the field of pupil guidance in study of vocations and career planning; and second, to make analyses of a number of the more desirable trades, professions, and business callings.

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. Professor Andrews.

Fundamental problems of public-school administration are assigned to each student for investigation and report. Among these are finance, legislative and supervisory functions of principals and superintendents, measurement of the educational product, school buildings, auxiliary educational agencies, the responsibility of the community and various ways of meeting it, health and physical training, and legislative and judicial acts as affecting education.

307. HISTORY OF EDUCATION B. Elective. Class work, three hours. Three semester credits. Professor Andrews.

The history of education in the classical civilizations, with some attention to the Orient, will be considered. The rise of the Christian church and its part in the preservation of learning and its educational institutions are studied. The Renaissance and the resulting modification of educational theory and practice receive careful attention. Finally we consider the modern scientific and social view, with its problems and purposes.

310. PSYCHOLOGY OF TEACHING AND LEARNING. First or second semester. Two semester credits. Professor Peterson.

This is a graduate course organized at the suggestion of members of the College Faculty who desire to improve scholastic standards in the College through a closer conformity of procedure to the laws and conditions of economical learning. An analysis is made of the various forms of learning and of the conditions favorable to the rapid development and effective functioning of knowledge, skills, attitudes and purposes. Emphasis is placed chiefly upon those conditions of learning which are directly under the individual or

collective control of college and high-school instructors. Methods and devices for directing and motivating the work of students through the objectification of aims and achievements are given special consideration in the light of the results of mental tests and educational measurements made in our own College and elsewhere.

315. SUPERVISION IN HOME ECONOMICS. Open to candidates for the master's degree. Class work, by appointment. Two semester credits. Prerequisites: Psychology, Methods in Teaching Home Economics, and experience in teaching home economics.

The work comprises the study of the problems which a supervisor or director of home economics in the public schools must meet, such as the standardization of work, the relation of supervisor to teacher, and the modernization of plant and equipment.

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.

330. AGRICULTURAL EDUCATION B. First or second semester. Class work, three hours. Three semester credits. Professor Williams.

This is a research survey course in the field of agricultural education, and is required of all candidates for the degree of Master of Science whose major work in the Department of Education is in the field of agricultural education. 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 of 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 Holz.

The fundamental instincts, the physiological and psychological characteristics of the various stages of development, and the best methods of moral and religous 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 1923-'24 and alternate years thereafter.

# English

Professor Davis
Professor Conover
Professor Rockey
Associate Professor Rice
Associate Professor Matthews
Associate Professor Faulkner
Associate Professor Russel
Assistant Professor Sturmer
Assistant Professor Elcock
Instructor Bower
Instructor Garvey
Instructor Rushfeldt
Instructor Aberle
Instructor Bogue
Instructor Callahan
Instructor Parker

Ability to think accurately and 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.

The equipment owned by the department is valued at $2,618.

## COURSES IN ENGLISH LANGUAGE

FOR UNDERGRADUATES

101. College Rhetoric I. Freshmen 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, Russel, and Faulkner, Assistant Professors Sturmer and Elcock, Miss Bower, Miss Garvey, Miss Rushfeldt, Miss Aberle, Miss Bogue, Mr. Callahan, and Mrs. Parker.

Beginning with a study of the selection of material, the planning, and the writing of compositions, this course reviews the essentials of correct and effective diction and sentence structure. The study of the sentence is accompanied by the writing of themes, largely narrative and expository, and business letters. Use of the library is suggested by prescribed and suggested reading lists. The aim of the course is to relate English composition to the student's real language needs. Texts: Thomas, Manchester, and Scott, *Composition for College Students;* Smart, *Handbook of Effective Writing;* and Cunlige and Lomer, *Adventures in Essay Reading.*

104. College Rhetoric II. Freshman year, both semesters. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric I. Professors Davis, Conover, and Rocky, Associate Professors Rice, Matthews, Russel, and Faulkner, Assistant Professors Sturmer and Elcock, Miss Bower, Miss Garvey, Miss Rushfeldt, Miss Aberle, Miss Bogue, Mr. Callahan, and Mrs. Parker.

This course is a continuation of College Rhetoric I. It begins with a study of paragraph structure. It then presents the basic principles of argument, description, and narration. Frequent themes are written upon practical as well as literary subjects. The aim of the course is to raise student standards in English, both in appreciation and in practice. Texts: Thomas, Manchester, and Scott, *Composition for College Students;* and Greever and Bachelor, *Century Book of Selections.*

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 and Associate Professors Matthews and Faulkner.

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. Associate Professor Rice, Assistant Professor Elcock, and Miss Aberle.

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 or College Rhetoric II 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: Smart, *Handbook of Effective Writing.*

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 Professors Matthews and Faulkner.

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 special value to the engineer are read and analyzed. Text: Harbarger, *English for Engineers.*

113. ADVANCED COMPOSITION I. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: College Rhetoric II. Professor Conover and Associate Professor Matthews.

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 Conover and Associate Professor Matthews.

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 narative are studied in detail, and attention is given to the short story.

122. COMMERCIAL CORRESPONDENCE. Elective, first semester and summer school. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric II. Professor Davis, Associate Professors Matthews and Faulkner, and Mr. Callahan.

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: Hotchkiss and Kilduff, *Advanced Business Correspondence.*

123. WRITTEN AND ORAL SALESMANSHIP. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric II, Commercial Correspondence. Professor Davis, Associate Professors Matthews and Faulkner, and Mr. Callahan.

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. Texts: Kitson, *The Mind of the Buyer;* and Ferris and Collins, *Salesmanship.*

128. ORAL ENGLISH. Elective, first semester and summer school. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric I. Professor Rockey and Associate Professor Matthews.

This course offers a study of the principles of oral composition as applied in conversation and informal discussion. Especial attention is paid to the correction of the grammatical faults of everyday speech and to the application

of rhetorical principles to informal speech and discussion. For subject matter students are directed to current happenings with particular attention to such cultural subjects as painting, music, and literature.

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 and Associate Professors Matthews and Faulkner.

This course consists of a rapid review of the essentials of English composition as applied to 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 and Associate Professor Faulkner.

How to advertise all kinds of farm produce in order to secure regular customers for parcel post or 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 intensive 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 work in the United States Department of Agriculture or experiment stations.

207. TECHNICAL WRITING. Elective, first semester. Work arranged by appointment. Two semester credits. Prerequisite: One of the following courses: 113, 116, 122, 201, 204. Professors Davis and Conover and Associate Professors Matthews and Faulkner.

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.*

225. THE LIGHT ESSAY. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: College Rhetoric II. Professor Davis.

This course is intended primarily for students who wish to make writing a life profession or who wish to do light essay writing in connection with their journalistic work. Much writing practice with essays and sketches from current standard magazines as models, is required. The writing of humor is stressed.

251. THE SHORT STORY I. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: English Literature. 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. 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, *Historical Study of the Mother Tongue;* and Bright, *Anglo-Saxon Reader.*

302. HISTORY OF THE ENGLISH LANGUAGE II. Elective, second semester. Class conference, two hours. Two semester credits. Prerequisite: English Literature. 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, *Historical Study of the Mother Tongue;* and Emerson, *Middle English Reader.*

304. RESEARCH IN APPLIED ENGLISH. Elective, second semester. Class conference, two hours. Two semester credits. Prerequisite: English Literature. 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

172. ENGLISH LITERATURE. Sophomore year, both semesters and summer school. Class work, three hours. Three semester credits. Prerequisite: College Rhetoric II. Professors Davis, Conover, and Rockey, Associate Professors Rice, Matthews, Russel, and Faulkner, Assistant Professors Sturmer and Elcock, Miss Bower, Miss Garvey, Miss Rushfeldt, Miss Aberle, Miss Bogue, Mr. Callahan, and Mrs. Parker.

In this course the students are made familiar with the principles of literary appreciation and are taught to apply them to representative 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.*

175. AMERICAN LITERATURE. Sophomore year, both semesters and summer school. Class work, three hours. Three semester credits. Prerequisite: English Literature. Professors Davis, Conover, and Rockey, Associate Professors Rice, Matthews, Russel, and Faulkner, Assistant Professors Sturmer and Elcock, Miss Bower, Miss Garvey, Miss Rushfeldt, Miss Aberle, Miss Bogue, Mr. Callahan, and Mrs. Parker.

This course consists of a study of the masterpieces of American prose and

poetry. The aims are to apply the principles of literary appreciation studied in English Literature to standard selections from American Literature, and to familiarize the students with the best contemporary American poetry, drama, and fiction. Texts: *A Short History of American Literature,* based upon The Cambridge History of American Literature; Pattee, *Century Readings in American Literature.*

181. HISTORY OF ENGLISH LITERATURE. Junior year, both semesters. Class work, three hours. Three semester credits. Prerequisite: English Literature. Professors Davis, Conover, and Rockey, Associate Professors Rice, Matthews, Russel, and Faulkner, Assistant Professors Sturmer and Elcock.

This course presents a study in the history of English Literature by means of lectures, discussions of the texts, and class reports on assigned reading. The aim is not only to apply principles of literary appreciation to standard selections, but also to study the work of the individual author in relation to the period in which he lived. Texts: Albert, *A History of English Literature;* Cunliffe, Pyre, and Young, *Century Readings in English Literature.*

FOR GRADUATES AND UNDERGRADUATES

271. THE ENGLISH BIBLE. Elective, both semesters and summer school. Class work, three hours. Three semester credits. Prerequisite: English Literature. Professor Conover.

In this course the different kinds of literature found in the English Bible are studied. Especial attention is paid to the narrative of the Old Testament, poetry, wisdom literature, and the book of Job. Text: Moulton, *The Modern Reader's Bible.*

273. SHAKESPEAREAN DRAMA I. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: English Literature. 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, or Othello, 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. Professor Davis and Assistant Professor Sturmer.

This course includes collateral readings in Shakespeare, his contemporaries, and present-day critics of Shakespeare. An intensive study is made 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 Brooke, Cunliffe, and MacCracken.

The work given in Shakespearean Drama I is not 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. Professors Conover and Rockey and Assistant Professor Elcock.

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. Text: Gosse, *Eighteenth Century Literature.*

277. NINETEENTH CENTURY LITERATURE. Elective first semester. Class work, three hours. Three semester credits. Given when there is a sufficiently large demand. Prerequisite: English Literature. Professors Davis, Conover, and Rockey, and Assistant Professor Elcock.

In this course there is a 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.

280. WORLD CLASSICS I. Elective, first semester. Class work, three hours. Three semester credits. Prerequisites: English Literature, and American Lit-

erature. Associate Professors Faulkner and Russel and Assistant Professor Elcock.

This course consists of a study of the literary masterpieces (in translation) of early times, particular attention being paid to Greek and Latin classics. The aim is to acquaint the student with that literature of the ancient world which has been of the foremost importance in forming the world's cultural ideas. Special reports, class discussions, lectures, and library readings comprise the work.

281. WORLD CLASSICS II. Elective, second semester. Class work, three hours. Three semester credits. Prerequisites: English Literature, and American Literature. Associate Professors Faulkner and Russel and Assistant Professor Elcock.

This course offers a study of the literary masterpieces (in translation) of western Europe. Particular attention is paid the works of Italian, Spanish, French, and German writings that have attained lasting world fame. Special reports, class discussion, lectures, and library readings comprise the work.

283. CONTEMPORARY FICTION. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: American Literature. Professor Conover.

This course consists of a study of the more important British and American fiction since Hardy. Representative novels are read, reported upon and discussed. Texts: Manley and Rickert, *Contemporary British Literature,* and *Contemporary American Literature;* and Van Doren, *Contemporary American Novelists.*

284. CONTEMPORARY DRAMA. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: American Literature. Professor Conover.

The aim in this course is to show the development of the drama since Ibsen and to give the student an acquaintance with the types of modern drama and with the works of important English, Irish, and American dramatists. Text: Dickinson, *Chief Contemporary Dramatists,* First Series.

286. THE NOVEL I. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: American Literature. Associate Professor Russel and Assistant Professor Elcock.

This course comprises a study of the English Novel, including the discussion of its historic 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: The Novel I. Associate Professor Russel and Assistant Professor 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, and Associate Professor Russel.

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 and Associate Professor Russel.

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. Given when there is a sufficiently large demand. Class work, three hours. Three semester credits. Prerequisite: American Literature. Professors Davis and Conover and Assistant Professor Elcock.

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, second semester. Class work, three hours. Three semester credits. Prerequisite: English Literature. Professors Davis and Rockey, Assistant Professor Sturmer.

This course offers a study in the interpretation of the most important poetic and dramatic works of Robert Browning. Texts: Browning, *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. Professors Davis and Rockey.

This course offers a study in the interpretation of the most important poetic works of Alfred Tennyson. Text: Tennyson, *Complete Poetical Works.*

295. THE ARTS AND CRAFTS MOVEMENT. Elective, second semester. Given when there is a sufficiently large demand. 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, Rosetti, Ruskin, and other writers of the same group are read and discussed. Text: Mackail, *Life of William Morris.*

297. CONTEMPORARY POETRY. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: History of English Literature. Professor Crawford, of the Department of Industrial Journalism, and Professor 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.

299. RESEARCH IN ENGLISH. Advanced students with acceptable fundamental training may, with the approval of the head of the department, undertake original investigation in some definitely prescribed field of English literature or applied English. Such work must be pursued under the direct supervision of some member of the faculty of the department, and the final results may be used to fulfill the thesis requirements for the master's degree. Students doing research in English will be required to give evidence of approved training in the subject and to have a broad general knowledge of English literature. Professors Davis, Conover, and Rockey, Associate Professors Rice, Matthews, Faulkner, and Russel, and Assistant Professors Sturmer and Elcock.

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: Beer's, *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.

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# Entomology

Professor DEAN*
Associate Professor MCCOLLOCH
Associate Professor MERRILL
Associate Professor SMITH
Assistant BRYSON

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.

The department owns equipment valued at $14,313.

## COURSES IN ENTOMOLOGY

### FOR UNDERGRADUATES

106. HOUSEHOLD ENTOMOLOGY. Elective, first semester. Class work two hours. Two semester credits. Prerequisites: General Zoölogy. 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

* Absent on leave till Jan. 1, 1925.

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. Laboratory charge, $1.

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.

203. GENERAL ENTOMOLOGY. Junior and senior years and elective, both semesters and summer school. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: General Zoölogy. 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. Laboratory charge, $1.

206. GENERAL ECONOMIC ENTOMOLOGY. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: General Entomology. Professor Dean and Associate Professor McColloch.

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 insect breeding. This work naturally involves 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. Laboratory charge, $1.

211. INSECT MORPHOLOGY I. Elective, first semester. Class work, one hour; laboratory, six hours. Three semester credits. Prerequisite: General Entomology. Associate Professor Smith.

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. Laboratory charge, $1.

212. INSECT MORPHOLOGY II. Elective, first semester. Laboratory, nine hours. Three semester credits. Prerequisite: Insect Morphology I. Associate Professor Smith.

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. Laboratory charge, $1.

216. PRINCIPLES OF TAXONOMY. Elective, second semester. Lectures, one hour. One semester credit. Prerequisite: (1) For students taking Taxonomy of Insects I: General Entomology and Insect Morphology I. (2) For students taking Taxonomy of Vertebrates: General Zoölogy. All students registering in Taxonomy of Insects I must also register for this course. Courses cannot be taken separately. Associate Professor Smith.

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. Associate Professor Smith.

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. Laboratory charge, $1.

218. TAXONOMY OF INSECTS II. Elective, second semester. Laboratory, nine hours. Three semester credits. Prerequisite: Taxonomy of Insects I and Insect Morphology II. Associate Professor Smith.

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. Laboratory charge, $1.

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. Laboratory charge, $1.

227. ADVANCED APICULTURE A. Elective, summer school. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Apiculture. Associate Professor Merrill.

This course is given during the summer school and is a continuation of apiculture. The principles of bee behavior discussed in the beginning course are studied under actual conditions during the active season. Practical work is given in the manipulation of bees during the production of the honey crop, in swarm-control methods, and in making increase in the colony. Queen rearing is studied and practical applications of the work are made. Laboratory charge, 50 cents.

228. ADVANCED APICULTURE B. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Apiculture (Ent. 111) or its equivalent. Associate Professor Merrill.

This course is a continuation of Apiculture (Ent. 111). The primary object of the 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. Laboratory charge, 50 cents.

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. Laboratory charge, $2.

231. ENTOMOLOGICAL AND ZOÖLOGICAL LITERATURE. Elective, first semester. Lectures, two hours. Two semester credits. 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, Associate Professor McColloch, Doctor Merrill, and Doctor Smith.

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 students 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 McColloch, Merrill and Smith.

# Geology

Professor NABOURS
Assistant Professor SPERRY *
Assistant Professor WILLIAMS **

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 in 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, minerals, and rock specimens, and a surrounding country rich in fossils and exhibiting considerable variety of hill, valley and stream, limestone, glacial drift, sand dunes and two igneous outcrops, are available for illustrative purposes.

## COURSES IN GEOLOGY

FOR UNDERGRADUATES

102. ENGINEERING GEOLOGY. Junior year and elective, first semester. Class work, three hours; laboratory, three hours. Four semester credits. Open for only two semester credits to students who have credit in Geol. 103. Prerequisites: Chemistry 105, or its equivalent. Assistant Professor Williams.

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, a study of topographic and geologic maps and of the principal rocks and their constituents. Occasional excursions are made to more distant points. Laboratory charge, $1.

103. GENERAL GEOLOGY. Elective, both semesters. Class work, three hours. Three or four field trips during each semester. Three semester credits. Not open to students who have credit in Geol. 102. Prerequisite: Chem. 105 or 110, or an equivalent course. Assistant Professors Sperry and Williams.

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. A brief study of rock-forming minerals is made. Laboratory charge, $1.

FOR GRADUATES AND UNDERGRADUATES

202. HISTORICAL GEOLOGY. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: General or Engineering Geology, General Zoölogy, and General Botany, or equivalent. Assistant Professor Sperry.

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.

*Laboratory.*—The laboratory work comprises the collection and study of local fossils, and their application in the identification of the rock measures, the study of museum specimens and of paleogeographic maps. Laboratory charge, $1.

206. ECONOMIC GEOLOGY. Elective, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: General Geology and General Chemistry. Assistant Professors Sperry and Williams.

This course treats of the origin and mode of occurrence of nonmetallic minerals, including coal and petroleum, and of metallic mineral deposits.

*Laboratory.*—The laboratory work comprises the identification and study of the ore-forming minerals, and map studies of the economic areas. Laboratory charge, $1.

* Absent on leave, 1924-'25.
** For the year 1924-'25.

# History and Civics

Professor PRICE
Professor ILES
Professor JAMES
Associate Professor PEINE
Assistant Professor CORRELL
Instructor ALSOP

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.

Equipment valued at $1,089 is owned by this department.

## COURSES IN HISTORY

FOR UNDERGRADUATES

103. AMERICAN HISTORY LECTURES. Elective, summer school. Two one-hour lectures a week. No credit. 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. Associate 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.

110. HISTORY OF COMMERCE AND INDUSTRY. Optional or elective, first semester. Class work, three hours. Three semester credits. Associate Professor Peine.

The evolution of industry and commerce from primitive beginnings to present-day organization is traced in broad outline. In effect, this course presents

an economic survey of world history. From noneconomic conditions among peoples in a collectional stage of development, the story of human progress is carried rapidly through nomadic, village, and town economy. The commerce of ancient and medieval peoples is briefly reviewed in reference to economic institutional development. The growth of regional specialization since the period of geographical discoveries and the expansion of international trade are studied. Most attention is naturally given to the modern period because of the immense significance in the present order of the development of the national state, manufacturing, transportation, and credit finance.

115. EUROPE (1500 TO 1815.) Elective, first or second semester. Class work, three hours. Three semester credits. Assistant Professor Correll.

This course traces the evolution of modern institutions from the close of the renaissance to the opening of the nineteenth century. The principal movements studied are the commercial revolution, through which European trade turned from Mediterranean to Atlantic ports; the Reformation; the earlier phases of the development of political democracy through the Puritan revolt in England and the French Revolution; and the Napoleonic era. Text, Hayes, *Political and Social History of Modern Europe,* Vol. 1.

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 226 or some other three-hour College course in history. 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. Professors Price, Iles and James, Assistant Professor Correll, and Miss Alsop.

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 historical and the civics courses.

FOR GRADUATES AND UNDERGRADUATES

201. 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. Prerequisite, when taken for graduate credit: three semester credits of college history. 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.

202. AMERICAN HISTORY II (*or* WESTWARD EXPANSION AND SECTIONALISM). Elective, both semesters and summer school. Class work, three hours. Three semester credits. Prerequisite, when taken for graduate credit: three semester credits of college history. 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. Prerequisite, when taken for graduate credit: three semester credits of college history. 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. Prerequisite, when taken for graduate credit: three semester credits of college history. Associate 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 its 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. Prerequisite, when taken for graduate credit: three semester credits of college history. 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. LATIN AMERICA. Elective, both semesters and summer school. Class work, two hours. Two semester credits. Prerequisite, when taken for graduate credit: three semester credits of college history. Professor James.

The history, government, industrial and social conditions of Mexico, Central America and the South American nations, and the interrelations of each of these and the United States, are studied in this course. Particular attention is given to contemporary Latin America. Lectures, assigned readings and quizzes.

223. MODERN EUROPE (SINCE 1814). Sophomore and junior years and elective, both semesters and summer school. Class work, three hours. Three semester credits. Prerequisite, when taken for graduate credit: three semester credits of college history. 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. Prerequisite, when taken for graduate credit: three semester credits of college history. Miss Alsop.

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.

226. 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. Prerequisite, when taken for graduate credit: three semester credits of college history. Professor James.

This course deals with the English phase of the European expansion movement, giving due consideration to the forces and influences promoting the "swarming of the English" overseas. The growth and development of the English provinces into self-governing colonies and the union of these into practically independent dominions is given detailed consideration. Finally, the drawing together of the widely scattered English peoples into a British Commonwealth of Nations under the stress of outside pressure, and the significance of this fact in the struggle for democracy, receives attention.

228. IMMIGRATION AND INTERNATIONAL RELATIONS. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite, when taken for graduate credit: three semester credits of college history. 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 effect 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.

FOR GRADUATES

301. RESEARCH IN HISTORY. Elective, both semesters and summer school. One to six semester credits. For prerequisites in each case, consult instructor. Professors Price, Iles, and James, Associate Professor Peine, and Assistant Professor Correll.

Work in this course consists of individual research problems in European or American history, including international relations. The conclusions will generally take the form of a thesis.

## 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 Ogg and Ray, *Introduction to American Government.* Throughout this course special and definite attention is given to recent and current events in governmental activities.

152. AMERICAN NATIONAL GOVERNMENT. Elective, first semester. May be substituted for course 151. Class work, three hours. Three semester credits. Professor Iles.

This course deals chiefly with the mechanism, functions and control of the government of the United States, but considerable attention is paid also to principles and problems. The course meets the requirements of three semester credits in government, and with course 153 affords a comprehensive study of American government, national, state and local. Students who have credit for course 151 cannot receive additional credit for either course 152 or 153.

153. AMERICAN STATE GOVERNMENT. Elective, second semester. May be substituted for course 151. Class work, three hours. Three semester credits. Professor Iles.

In this course attention is limited to state and local government, and special attention is given to functions and problems. Courses 152 and 153 are based on good modern texts, with lectures and assigned readings.

160. COMMERCIAL LAW. Junior year, both semesters. Class work, one hour. One semester credit. Assistant Professor Correll.

This course is designed solely for those curricula that require only one hour of business law. In the main, the subjects forming the content of Business Law A and B are here considered, only the most fundamental principles being studied.

Business Law A may be substituted for Commercial Law, and where the requirements of the curricula permit, the extra credit used as an elective.

161. BUSINESS LAW A. Both semesters and summer school. Class work, two hours. Two semester credits. Associate Professor Peine.

This is fundamentally a course in contracts and sales, preceded by a careful consideration of the nature of law in general and the scope of the laws of business. A text is used in Business Law A and B, but emphasis is placed upon the concrete legal problems of business as illustrated in actual cases.

162. BUSINESS LAW B. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Business Law A. Associate Professor Peine.

The general field covered by this course is the law of credit relations and the law of business organization, with a brief consideration of the law of property. Subjects included are negotiable instruments, guaranty, damages, dissolution, agency, partnership, corporations, bailments, insurance, property.

175. FARM LAW. Elective, first semester. Class work, two hours. Two semester credits. Associate Professor Peine.

The application of the laws of real and personal property to the business of farming makes up the major part of this course. Among the topics studied are the ownership of the farm, boundaries, water rights including irrigation, mortgages, leases, ownership of crops and live stock, rights of the government under inspection and quarantine laws, liability for damages done by domestic animals, sale and transportation of farm products, insurance. A brief analysis of the elements of contracts is made as an aid to those who have had no previous work in business law. By special arrangement, this course may be taken for credit by one who has had Business Law A and B.

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. 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: Lawrence, *Principles of International Law.*

FOR GRADUATES

351. RESEARCH IN GOVERNMENT. Elective, both semesters and summer school. One to six semester credits. For prerequisites in each case, consult instructor. Professors Price, Iles, and James, Associate Professor Peine, and Assistant Professor Correll.

Work in this course consists of individual research problems in national or local government, American or European, including studies in comparative government or international law. The conclusions generally take the form of a thesis.

## Industrial Journalism and Printing

Professor CRAWFORD*
Professor ROGERS
Associate Professor KEITH
Assistant Professor POLSON
Assistant Professor AMOS
Instructor SALISBURY

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 semiweekly 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. This department owns equipment valued at $15,313.

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 and Assistant Professor Amos.

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.

* Absent on leave, year 1925-'26.

104. PRINCIPLES OF TYPOGRAPHY II. Freshman year, second semester. Class work, two hours; laboratory practice, three hours. Three semester credits. Associate Professor Keith and Assistant Professor Amos.

The work of the preceding course is continued, a study being made of type faces and the topography 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 and Assistant Professor Amos.

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 and Assistant Professor Amos.

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 and Assistant Professor Amos.

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 and Assistant Professor Amos.

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 and Assistant Professor Amos.

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 and Assistant Professor Amos.

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 and Assistant Professor Amos.

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 and Assistant Professor Amos.

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. Prerequisite: Consult instructor. 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. Assistant Professor Polson and Mr. Salisbury.

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.

154, 155, 158, 159. JOURNALISM PRACTICE I, II, III, IV. These courses comprise laboratory practice accompanying courses 151, 161, 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, Assistant Professor Polson, and Mr. Salisbury.

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.

161. INDUSTRIAL WRITING. Sophomore year, second semester. Class work, two hours. Two semester credits. Prerequisite: Elementary Journalism. Assistant Professor Polson and Mr. Salisbury.

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. Prerequisite: For Industrial Journalism students, Industrial Writing; for Rural Commerce students, Written and Oral Salesmanship. Professor Davis, of the Department of English, and Associate Professor Keith.

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.

FOR GRADUATES AND UNDERGRADUATES

250. ADVERTISING PRACTICE. Elective, first semester. Class work, two hours. Two semester credits. Prerequisite: Principles of Advertising. Professor Davis, of the Department of English, and Associate Professor Keith.

This course consists of practice in advertising writing. Special attention is given to copy and display problems. Practical problems found in the advertising of student activities and of local merchants are worked out, and students in the course are required to do actual commercial work.

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. ——— and Mr. Salisbury.

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 distinction 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.

255. CONTEMPORARY THOUGHT. Senior year, first semester. Class work, three hours. Three semester credits. Prerequisite: Industrial Feature Writing II, or its equivalent in other curricula. Professor Crawford.

This course seeks to correlate and unify various subjects that have been previously studied in college. Endeavoring to present without bias contemporary developments and contemporary figures in science, the arts, and philosophy, the course is intended to aid the student in forming the habit of independent thinking. It thus serves both as a preparation for the following course in editorial practice and as an aid to the student in beginning his life as a

practical journalist. Lectures by authorities in various fields and by the instructor in charge, assigned readings, papers, and class discussions are included in the course.

257. EDITORIAL PRACTICE. Senior year, second semester. Class work, two hours. Two semester credits. Prerequisite: Copy Reading. Professor Crawford and Associate Professor Rogers.

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 author's rights, including the federal law of copyrights, 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. Assistant Professor 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 Assistant Professor 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. Prerequisite: One semester of college American History. Professor Crawford.

This 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 Unted 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 when requested by a sufficient number. Professor Davis, of the Department of English, and Professor Crawford.

The course deals with the conducting of the so-called column, humorous or semiserious. 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.

FOR GRADUATES

351. RESEARCH IN INDUSTRIAL JOURNALISM. Both semesters. Class work, two to five hours. Two to five semester credits. Professor Crawford.

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.

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# Library Economics

Librarian SMITH
Associate Librarian DERBY
Reference Librarian DAVIS
Loan Librarian BISCHOF
Reference Assistant AUSTIN
General Assistant CORY
Loan Assistant BROWN

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.

The books and pamphlets in the library are valued at $238,350; other equipment has a value of $30,709.

## COURSES IN LIBRARY ECONOMY

FOR UNDERGRADUATES

101. LIBRARY METHODS. Freshman year, both semesters. Class work, one hour. One semester credit. Associate Librarian Derby, Miss Davis, Miss Austin, Miss Cory, Miss Brown, and Miss Bischof.

This 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
Professor STRATTON
Assistant Professor HYDE
Assistant Professor LEWIS
Assistant Professor LYONS
Instructor HOLROYD
Instructor ROWE
Instructor JANES
Instructor MOSSMAN
Instructor KNEPPER

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.

As several of the curricula of the College are formulated on the assumption that a half-year of solid geometry will have been taken in high school, classes in this subject are provided for students who are deficient in this respect. College credit on electives is allowed for this work.

The equipment owned by this department is valued at $595.

## 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 Stratton, Assistant Professors Hyde, Lewis, and Lyons, Miss Holroyd, Mr. Janes, and Miss Mossman.

This course treats of the functions of acute angles, right triangles, goniometry, oblique triangles, practical problems. Text: Rothrock'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 Stratton, Assistant Professors Hyde, Lewis, and Lyons, Miss Holroyd, Mr. Janes, and Miss Mossman.

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: Hawke's *Higher 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 Stratton, Assistant Professors Hyde, Lewis, and Lyons, Miss Holroyd, Mr. Janes, and Miss Mossman.

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. Professors White and Stratton, and Assistant Professors Hyde and Lyons.

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: Love's *Analytical Geometry.*

119. CALCULUS. Sophomore year and elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Analytical Geometry. Professors Remick and Stratton.

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. 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.

126. ELEMENTS OF STATISTICS. Elective, first semester. Class work, three hours. Three semester credits. Professor White.

This course consists in the study of the parts of algebra most needed as a basis for statistical work, followed by a development of the elementary principles used in the analysis of statistical data. Use is made of farm bulletins, agricultural reports, etc. The work proceeds by lectures, readings, and recitations.

131. INSTITUTIONAL ACCOUNTING. Elective, second semester. Class work, three hours. Three semester credits. 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.

137A. ACCOUNTING. Freshman year, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Mr. Rowe and Mr. Knepper.

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.

140A. ACCOUNTING PRACTICE I. Sophomore year, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Accounting or one year of high-school bookkeeping. Mr. Rowe and Mr. Knepper.

This course includes a study of the principles and structure of accounts and is designed to give power to analyze commercial accounts and statements. A complete study of the accounting process is taken up from the recording of transactions to the summarization of statements. Special attention is given to the adjustments for accrued, deferred, and prepaid items. Problems and practice sets are used in the laboratory period as an application of principles to practice. Text: Kester's *Accounting Theory and Practice.*

143A. ACCOUNTING PRACTICE II. Sophomore year, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Mr. Rowe and Mr. Knepper.

The course includes a study of partnership and corporation accounting of problems peculiar to them. It also considers the valuation of balance-sheet items with especial reference to depreciation, inventories, and intangibles. A few other miscellaneous topics such as controlling accounts are also treated. The laboratory work consists in working out a complete set of books for a corporation. Text: Kester's *Accounting Theory and Practice.*

150. MATHEMATICS OF INVESTMENT. Junior year, second semester. Class work, three hours. Three semester credits. Prerequisite: Accounting Practice II. Mr. Rowe and Mr. Knepper.

The course deals with the calculation of compound interest, and includes the study of annuities, methods of measuring depreciation, and the determination of the price at which bonds should be bought to yield a market rate of interest. The amortization of premiums and the accumulation of discount on bonds are considered with special reference to their accounting significance. Some attention is given to life insurance actuarial problems. Text: Putnam's *Mathematics of Finance.*

155. ADVANCED ACCOUNTING. Elective, second semester. Class work, three hours. Three semester credits. Prerequisites: Accounting Practice II, Cost Accounting, and Mathematics of Investment. Mr. Rowe.

The course deals with the advanced theories of accounts, a further study of valuation and corporation accounting than is given in Accounting Practice II, accounting for reorganizations and consolidations, also for railroads, and a study of the income tax. Instruction is by lectures, recitations, and problems.

FOR GRADUATES AND UNDERGRADUATES

The following courses are available on request by a sufficient number of students. Numbers 201, 204, 205, 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: Cohen's *Differential Equations.*

203. THEORY OF STATISTICS. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Elements of Statistics, or its equivalent. Professor White.

This course includes a study of the theory of probability applied to statistical problems; frequency curves, correlation theory, curve fitting, problems of random sampling. Actual practice is given with data from biology, agronomy, physics, etc. The work proceeds by lectures, readings, and recitations.

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.

205. CALCULUS I. Sophomore year and elective, second semester. Class work, five hours. Five semester credits. Prerequisite: Plane Analytical Geometry. Professors Remick, White, Stratton, and Assistant Professor Lyons.

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.*

206. CALCULUS II. Junior year and elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Calculus I. Professors Remick, White, Stratton, and Assistant Professor Lyons.

In the 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.*

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. Prerequisite: Calculus II. 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. 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. Prerequisite: Analytical Geometry. 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.

326. CALCULUS OF VARIATIONS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Differential Equations. Professor Remick.

The course includes a treatment of some of the standard problems of maxima and minima wherein a definite integral affords the fundamental form of expression.

331. MATHEMATICAL RESEARCH. First and second semesters. Required of all candidates for the master's degree whose major work is in the department of mathematics. Hours of work and credit are to be arranged in consultation with the head of the department.

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## Department of Military Science and Tactics

Professor BUGBEE, Lt. Col. Inf., U. S. A.
Associate Professor PEIRCE, Major C. A. C., U. S. A.
Associate Professor STICKNEY, Captain Inf., U. S. A.
Assistant Professor JONES, Captain Inf., U. S. A.
Assistant Professor WALTZ, Captain Inf., U. S. A.
Assistant Professor SPENCER, Captain C. A. C., U. S. A.
Assistant Professor WERTZ, Captain C. A. C., U. S. A.
Assistant Professor FITZGERALD, Captain V. C., U. S. A.
Assistant Professor MCGARRAUGH, First Lieut. C. A. C., U. S. A.
Assistant Professor COLE, First Lieut. Inf., U. S. A.
Supply Officer CLAEREN, Major O. R. C.
Instructor ILLINGSWORTH, Band Leader, U. S. A. (Retired).
Instuctor COFFEY, Staff Sergeant C. A. C., U. S. A.
Instructor CONNOLLY, Staff Sergeant Cavalry, U. S. A.
Mechanic WILSON, Pvt. First Cl., C. A. C., U. S. A.

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.

Students enrolling in military courses who were members of junior units, R. O. T. C., at military academies or high schools, or those receiving military training while enrolled in government-aided schools (section 55*c*, national defense act, and section 1225, Revised Statutes) may apply for advanced credit examinations on the basis for one semester for each semester of training at a military academy; or for one semester for each year of training at a high school or government-aided school; provided there is stationed at these schools a regular officer of the United States Army; and provided further that no credit will be given beyond the basic course, which comprises the first four semesters of the College (freshman and sophomore years). (See "Advanced Credits.")

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 professor of Military Science and Tactics, 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 any account 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.

Members of the R. O. T. C. will receive the benefits mentioned below:

1. SENIOR DIVISION, BASIC COURSE (Freshmen, Sophomores). 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. Shoes are not furnished. Each student should provide himself with a pair of high tan shoes, not laced boots, before entering College as they will be required immediately upon his admission.

A fee of 25 cents per semester is charged all students assigned to military training.

Corporals are selected from the sophomores and specially qualified freshmen.

A six weeks' training camp, which is normally held at Fort Snelling, Minn., 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 a special uniform.

He will receive commutation of subsistence at the rate of 30 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 70 cents per day for not to exceed six weeks, and five cents per mile to and from camp 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 with pay at the rate of $125 per month, with the usual allowances. (Ration allowance is $18 and allowance for quarters, $40.)

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 one regiment. 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 higher noncommissioned officers are selected from the students taking the Advanced Course, R. O. T. C., according to class standing. 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.

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.

This department possesses equipment valued at $1,677. In addition, the department is the custodian of federal government equipment valued at $200,000.

## COURSES IN MILITARY SCIENCE AND TACTICS

FOR UNDERGRADUATES

### 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 and one-half semester credits. Prerequisite: None. Lieutenant Cole.

The work of this course is divided as follows:

(*a*) *Practical.* Physical training, infantry drill, bayonet training, preliminary marksmanship.

(*b*) *Theoretical.* Recitation: Military courtesy, national defense policy, infantry drill regulations.

102. INFANTRY II. Freshman year, second semester. Lectures, recitations, and military drill, four hours a week. One and one-half semester credits. Prerequisite: Infantry I. Lieutenant Cole.

This course includes a study of infantry drill regulations, rifle marksmanship, personal combat, scouting and patrolling, and is divided as follows:

(*a*) *Practical.* Infantry drill, scouting and patrolling, and rifle marksmanship.

(*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 and one-half semester credits. Prerequisites: Infantry I and II. Captain Jones.

The course includes a study of infantry drill, leadership, map reading, military sketching and infantry weapons, and is divided as follows:

(*a*) *Practical.* Acting as instructors of freshmen in infantry drill, automatic rifle firing, bayonet drill, sketching and plane-table surveying, musketry problems.

(*b*) *Theoretical.* Sketching and map reading (panoramic and plane), weapons of the infantry platoon.

104. INFANTRY IV. Sophomore year, second semester. Lectures, recitations, and military drill, four hours. One and one-half semester credit. Prerequisite: Infantry II. Captain Jones.

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, 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.

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. Captain Waltz.

This course embraces a study of field engineering, tactics and military law.

(*a*) *Practical.* Leadership and instruction in all basic course subjects.

(*b*) *Theoretical.* Study and recitation, field engineering, tactics and military law.

110. INFANTRY VI. Junior year, second semester. Lectures, recitations, and military drill, five hours. Three semester credits. Prerequisite: Infantry V. Captain Waltz.

This course comprises a study of infantry accompanying weapons, machine guns, 37-mm. guns, light mortars, organization, command and leadership, and law, and is divided as follows:

(*a*) *Practical.* Same as in course 109 (Infantry V).

(*b*) *Theoretical.* Mechanism and use of accompanying weapons, 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. Captain Stickney.

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. Captain Stickney.

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).

NOTE.—Advance-course students are required to attend one camp. This comes normally at the end of the junior year, and is held normally at Fort Snelling, Minn.

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 and one-half semester credit. Prerequisites: None. Lieutenant McGarraugh.

The work of this course is the same as for course 102 (Infantry II).

114. ARTILLERY II. Freshman year, second semester. Lectures, recitations, and practical instruction, four hours. One and one-half semester credit. Prerequisites: Artillery I or Infantry I. Lieutenant McGarraugh.

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 and one-half semester credit. Prerequisite: Artillery II or Infantry II. Captain Wertz.

The work of this course is divided as follows:

(*a*) *Practical.* Infantry instruction, heavy artillery and anti-aircraft artillery.

(*b*) *Theoretical.* Infantry drill regulations, artillery matériel.

116. ARTILLERY IV. Sophomore year, second semester. Lectures, recitations, and practical instruction, four hours. One and one-half semester credit. Prerequisite: Artillery III. Captain Wertz.

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; motor transportation, and orientation.

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. Captain Spencer.

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 matériel, orientation.

(*b*) *Theoretical.* Gunnery, matériel and orientation.

118. ARTILLERY VI. Junior year, second semester. Lectures, recitations, and practical instruction, five hours. Three semester credits. Prerequisite: Artillery V, and Plane Trigonometry. Captain Spencer.

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 Peirce.

The course is divided into—

(*a*) *Practical.* Duties as cadet officers and noncommissioned officers; artillery matériel, orientation, motor transportation.

(*b*) *Theoretical.* Administration, gunnery, tactical employment of artillery, motor transportation.

120. ARTILLERY VIII. Senior year, second semester. Lectures, recitations, and military drill, five hours. Three semester credits. Prerequisite: Artillery VII. Major Peirce.

This course is divided into—

(*a*) *Practical.* Section (*a*) of course 119; gunnery.

(*b*) *Theoretical.* Military law, gunnery, military policy, field engineering.

NOTE.—Advanced-course students are required to attend one camp. This comes normally at the end of the junior year and is held normally at Fort Monroe, Va.

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 and one-half semester credit. Prerequisites: None. Captain FitzGerald.

The work of this course is divided as follows:

(*a*) *Practical.* Same as course 101 (Infantry I).

(*b*) *Theoretical.* Organization and policies of the U. S. army, military art.

122. MILITARY SCIENCE (VET.) II. Freshman year, second semester. Lectures, recitations, and military drill, four hours. One and one-half semester credit. Prerequisite: Course 121. Captain FitzGerald.

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 and one-half semester credit. Prerequisite: Military Science (Vet.) 11. Captain FitzGerald.

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 and one-half semester credit. Prerequisite: Course 123. Captain FitzGerald.

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 in 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. Captain FitzGerald.

This course is divided into—

(*a*) *Practical.* Duties of junior officers demonstrated.

(*b*) *Theoretical.* Organization and administration, sanitation, and animal management.

130. MILITARY SCIENCE (VET.) VI. Junior year, second semester. Lectures and recitations, three hours. Three semester credits. Prerequisite: Course 129. Captain FitzGerald.

This course is divided into—

(*a*) *Practical.* Continuation of section (*a*), course 129.

(*b*) *Theoretical.* Sanitation, including inspection of meat and food products.

131. MILITARY SCIENCE (VET.) VII. Senior year, first semester. Lectures and recitations, three hours. Three semester credits. Prerequisite: Course 130. Captain FitzGerald.

This course is divided into—

(*a*) *Practical.* Continuation of section (*a*), course 129.

(*b*) *Theoretical.* Hospitals, hospitalization, and sanitation.

132. MILITARY SCIENCE (VET.) VIII. Senior year, second semester. Lectures and recitations, three hours. Three semester credits. Prerequisite: Course 131. Captain FitzGerald.

This course is divided into—

(*a*) *Practical.* Continuation of section (*a*), course 129.

(*b*) *Theoretical.* Communicable diseases, forage inspection, organization and administration (continued), résumé of entire course.

NOTE.—Advanced-course students are required to attend one camp. This comes normally at the end of the junior year, and is held normally at Fort Snelling, Minn.

# Modern Languages

Professor CORTELYOU
Associate Professor LIMPER
Assistant Professor HESSE
Instructor WILLMANN
Instructor BROWNELL

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.

The department equipment is valued at $511.

## COURSES IN GERMAN

### FOR UNDERGRADUATES

101. GERMAN I. Freshman and junior years and elective, first semester. Class work, three hours. Three semester credits. No prerequisite. Professor Cortelyou and Associate Professor Limper.

In the work of this course there are included the study of articles, declensions and 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' *Essentials of German* (first eighteen lessons).

102. GERMAN II. Freshman and junior years and elective, second semester. Class work, three hours. Three semester credits. Prerequisite: German I, or its equivalent. Professor Cortelyou and Associate Professor Limper.

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 is taught as a living language. Written translations from English into German are frequent. Text: Vos' *Essentials of German* (completed).

111. GERMAN READINGS. Senior year and elective, first semester. Class work, three hours. Three semester credits. Prerequisite: German II, or its equivalent. Professor Cortelyou and Associate Professor Limper.

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, second semester. Class work, three hours. Three semester credits. Prerequisite: German Readings. Offered when requested by a sufficient number. Professor Cortelyou and Associate Professor Limper.

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.

206. GERMAN COMEDIES. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: German Readings. Offered when requested by a sufficient number. Professor Cortelyou and Associate Professor Limper.

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.*

226. GERMAN CLASSICS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Course 201 or 206. Offered when requested by a sufficient number. 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. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Course 201 or 206. Offered when requested by a sufficient number. 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, first semester. Class work, four hours. Four semester credits. Prerequisite: German II. 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: Wright's *German Science Reader.*

## COURSES IN FRENCH

FOR UNDERGRADUATES

151. FRENCH I. Sophomore and senior years and elective, both semesters and summer school. Class work, three hours. Three semester credits. Associate Professor Limper and Miss Brownell.

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. Sophomore and senior 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 Brownell.

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. Text: Lamb's *Inductive French Grammar* (completed).

161. FRENCH READINGS. Elective, first semester and summer school. Class work, three hours. Three semester credits. Prerequisite: French II. Associate Professor Limper and Miss Brownell.

This is especially a reading course, the purpose being to enlarge the student's vocabulary. Grammar is reviewed and considerable time is devoted to conversation. Texts: Labiche et Martin's *Le Voyage de Monsieur Perrichon* and Hugo's *Les Miserables.*

FOR GRADUATES AND UNDERGRADUATES

251. FRENCH SHORT STORIES. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: French Readings or two years of high-school French. Associate Professor Limper and Miss Brownell.

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.*

256. THE FRENCH DRAMA. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: French Readings. Associate Professor Limper.

A few of the outstanding plays of the seventeenth, eighteenth, and nineteenth centuries by Molière, Corneille, Beaumarchais, Labiche et Martin, and Hervieu are read in this course. The place that these plays occupy in the history of the French drama is brought out by lectures and collateral reading.

261. FRENCH COMPOSITION AND CONVERSATION. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Twelve hours of college French, or the equivalent. Offered when requested by a sufficient number. Associate Professor Limper.

This course is for those who desire to acquire fluency in writing and speaking French. The class period is devoted to practice in the spoken language. Written themes are required as preparation for each recitation.

270. TEACHERS' COURSE IN FRENCH. Elective; offered when requested by a sufficient number. Class work, three hours. Three semester credits. Prerequisite: Consult 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. Assistant Professor Hesse and Miss Willmann.

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. Texts: Olmsted's *First Course in Spanish* and reader.

177. SPANISH II. Elective, both semesters. Class work, three hours. Three semester credits. Prerequisite: Spanish I, or one year of high-school Spanish. Assistant Professor Hesse and Miss Willmann.

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: Olmsted's *First Course in Spanish* and Rivera and Doyle's *En España.*

180. SPANISH READINGS. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Spanish II. Assistant Professor Hesse and Miss Willmann.

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. Texts: Mármol's *Amalia,* edited by Corley, and Alarcon's *El Final de Norma.*

186. SPANISH SHORT STORIES. Elective, second semester. Class work, three

hours. Three semester credits. Prerequisite: Spanish Readings. Assistant Professor Hesse and Miss Willmann.

An effort is made in this course to give a glimpse into the realm of Spanish literature without the necessity of reading various length novels and histories of literature. The stories here read are chosen from the most eminent of modern Spanish authors, such as Bèquer, Trueba, Alarcón, Valès, and Ibañez. The rich and varied vocabulary here offered has both literary and practical value and furnishes ample material for conversation. Text: *Spanish Short Stories,* by Hills and Reinhardt.

195. SPANISH CONVERSATION. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Spanish Readings, or its equivalent. Assistant Professor Hesse and Miss Willmann.

The purpose of this course is to develop in the student an ability to speak Spanish and to understand the spoken language. Various books, magazines and papers provide the material used in the classroom.

FOR GRADUATES AND UNDERGRADUATES

275. THE SPANISH NOVEL. Elective, first semester. Class work, three hours. Three semester credits. Prerequisite: Spanish Short Stories, or its equivalent. Assistant Professor Hesse.

An endeavor is made to give a panoramic view of the Spanish novel in the several periods of Spanish literary production. Class work consists of lectures, reading in class, and outside readings.

280. THE SPANISH DRAMA. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Spanish Short Stories, or its equivalent. Assistant Professor Hesse.

A general view is given of the drama produced in Spain's best literary periods. Class work consists of lectures, class readings, and reports on readings done outside the class period.

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# Music

Professor Pratt*
Associate Professor WHEELER
Associate Professor SMITH
Assistant Professor PUTNAM
Assistant Professor GORDON
Assistant Professor HARTMAN
Assistant Professor ELLIS
Assistant Professor KENNEDY
Assistant Professor PAINTER
Assistant Professor GRUBER
Instructor LAMONT
Instructor SCOTT
Instructor THORNBURG
Instructor BROWN
Instructor ILLINGWORTH
Instructor MURPHY
Instructor PASMORE

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 study. The Department of Music is provided with equipment to the value of $18,035.

## 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

* Resigned. Associate Professor Wheeler becomes professor and head of the department on July 1, 1925.

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.

### AUXILIARY PIANO TRAINING

Attendance at a one-hour auxiliary class alternate weeks is required of all students majoring in piano. Frequent opportunity for playing is given here and a study is made of musical terminology and of the development of piano literature.

## 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: Music fundamentals or its equivalent. Assistant Professor Gordon and Miss Murphy.

This course includes in the first semester a review of the major and minor scales, intervals, the construction and progression of the primary triads and their inversions; the dominant seventh and its progressions and inversions, harmonizing melodies and bases, a certain amount of original work and

elementary instrumentation. The second semester's work deals with the subordinate triads and their sevenths in progression and inversions and the beginnings of modulation. An effort is made the second semester to write as many original exercises as possible.

103, 104. HARMONY III AND IV. Sophomore year, first and second semesters respectively. Class work two hours. Two semester credits for each. Prerequisite: Harmony II. Miss Murphy.

In this course an effort is made to present the remainder of the work in modulation, the altered and mixed chords and embellishments in the first semester in order that the second semester may be spent in the study of the works of the masters, and in writing original exercises and small compositions.

105, 106, 107 and 108. EAR TRAINING AND SIGHT SINGING I, II, III AND IV. Freshman and sophomore years, 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 Hartman and Miss Murphy.

This course is a study in the reading and hearing of intervals, chords, and rythmical forms.

108A. COUNTERPOINT. Junior year, first and second semesters. Class work, two hours. Two semesters credit. Prerequisite: Harmony IV. Assistant Professor Gordon.

This course includes a study of melody writing, the association of melodies in simple counterpoint, leading at the end of the first semester to the writing of original two- and three-part inventions.

109. MUSICAL FORM AND ANALYSIS. Junior year, first and second semesters. Class work, two hours. Two semester credits. Prerequisites: Harmony IV and Counterpoint. Assistant Professor Gordon.

In the semester's work in Form and Analysis an effort is made to give the student a general conception of the various forms used in composition. Study is made of the music of Bach, Haydn, Beethoven, Schumann, Mendelssohn, Chopin and others.

112, 113. HISTORY AND APPRECIATION OF MUSIC I AND II. Freshman year, first and second semesters, respectively. Class work, three hours. Three semester credits for each course. Mr. Lamont.

A modern text forming the basis of this work is supplemented by lectures, library research, extensive use of the victrola, and recitals by the faculty. This course is correlated wherever possible with corresponding political events, and the development of the fine arts in general. The aim is to give the student definite knowledge of each of the musical periods, the style of music peculiar to each, and contact with the great personalities.

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.

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. PUBLIC-SCHOOL MUSIC 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 the piano keyboard. Assistant Professor Hartman.

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. PUBLIC-SCHOOL MUSIC III AND IV. Second year, first and second semester, respectively. Lectures, research, and practice teaching, two hours. Two semester credits for each course. Assistant Professor Hartman.

These courses are a continuation of Public-school Music I and II.

124, 125. PUBLIC-SCHOOL MUSIC V AND VI. Junior year, first and second semesters respectively. Lectures, research and practice teaching, two hours. Two semester credits for each course. Prerequisites: Public-school Music I, II, III, and IV. Assistant Professor Hartman.

These courses are a continuation of Public-school Music I, II, III and IV.

126, 127. PUBLIC-SCHOOL MUSIC VII AND VIII. Senior year, first and second semesters, respectively. Lectures, research, and practice teaching, two hours. Two semester credits for each course. Prerequisites: Public-school Music V and VI. Assistant Professor Hartman.

These courses are a continuation of Public-school Music I to VI.

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, 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. Associate Professor Smith.

Discussion of the principles and processes involved in the various phases of piano study as a means of music education. Teaching material for the piano is studied and there is frequent observation of lessons given in the preliminary piano classes of the College.

145. METHODS OF TEACHING MUSIC. Junior year, first semester. Lectures, research and demonstration, one hour. One semester credit. Professor Pratt, Associate Professors Wheeler and Smith, and Mr. Lamont.

This course is designed for public-school music students majoring in some instrument and preparing to teach it as an accredited subject in high school. It is taught in separate divisions for piano, voice, violin and the other instruments of band and orchestra. The course comprises a study of methods of teaching fundamental technic, selection of teaching materials, and the outlining of courses of study.

## PRACTICAL COURSES IN MUSIC

FOR UNDERGRADUATES

155. MUSICAL FUNDAMENTALS. Elective, both semesters. Class work, one hour. One semester credit. Miss Murphy.

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.

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 Professors Putnam, Ellis, Gruber, and Miss Scott.

An entrance examination is prerequisite to this course, and prospective students should write the head of the Department of Music for a list of the material required. This course is intended for students having special talent, and its purpose is to give sound technical training in the use of the vocal mechanism. The production of tone in singing is governed by certain fundamental, explainable laws of phonetics and breath control. Teaching the intelligent use of these laws is the constant objective of 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 the mother tongue is constantly stressed. The effort is to develop capable teachers and good performers and thus to lay the foundation for further artistic development.

161A to 161H. VOICE A-I TO A-VIII. Freshman year, first semester to senior year, second semester, public-school music curriculum, and elective. Two private lessons each week; six hours of preparation. Two semester credits. Professor Pratt, Assistant Professors Ellis, Putnam, Gruber, and Miss Scott.

The instruction in this course follows the same plan as that pursued in courses 160A to 160H, but less preparation is required.

163A to 163H. VOICE B-I TO B-VIII. Freshman year, first semester to senior year, second semester, and elective. One private lesson each week; six hours of preparation. One semester credit for each course. Professor Pratt, Assistant Professors Putnam, Ellis, Gruber, and Miss Scott.

The instruction in this course follows the same plan as that pursued in courses 161A to 161D, with but one lesson per week instead of two.

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. Mr. Lamont.

This course is reserved for the student who shows an especial talent for the violin and enters college technically equipped to begin the study of the standard works of violin literature. No special method is advocated, it being the aim of the department to make the method conform to the particular needs of the pupil rather than the pupil to the method. A graceful and natural style is insisted upon, however, and the outline of study is so planned that an equibalanced technique, and sound, fine musicianship are developed.

166. VIOLIN A. Elective in College curricula. Two private lessons each week; six hours of preparation. Two semester credits. Mr. Lamont.

This course is open to the entire student body of the College. There are no prerequisites. Fundamentals are very carefully presented.

167. VIOLIN B. Elective in College curricula. One private lesson each week; six hours preparation. One semester credit. Mr. Lamont.

This course is the same as Violin A, with but one lesson a week, rather than two.

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. Mr. Lamont.

This is a practical course in the playing of string duets, trios, quartets, and other ensemble compositions.

170A to 170H. PIANO I TO VIII. Two private lessons each week. Four semester credits. Associate Professor Smith, Assistant Professors Pasmore, Painter and Kennedy.

An entrance examination is prerequisite to this course, and prospective students should write the head of the Department of Music for a list of material required. This course is intended for students having special talent, and its purpose is to give a sound technical foundation; to cultivate a thinking musicianship; to acquaint students with a general amount of the best music literature; to develop capable teachers and good performers and thus to furnish the foundation upon which the superstructure of the artist may be built. The instruction as outlined for each year is a conservative estimate of what a student of average talent is expected to accomplish. Every two weeks a supplementary playing class is held, open to all piano students, recommended for admission by their teacher. Opportunity is given for frequent playing; study of music terminology; discussions of how to study and the development of knowledge of piano literature.

172A to 172H. PIANO A-I TO A-VIII. All four years public-school music, voice curriculum and elective. Two private lessons each week; six hours preparation minimum. Two semester credits. For public-school music students an entrance examination is prerequisite. Associate Professor Smith, Assistant Professors Pasmore, Painter, and Kennedy, and Misses Murphy, Brown and Thornburg.

Attention is given to sight reading and accompaniment for public-school music students and to developing a medium grade of pianistic performance. Students having sufficient talent to carry this course as a major subject throughout four years and fulfilling certain requirements may be granted a certificate to teach piano as an accredited subject in high school. See course 145.

174A to 174H. PIANO B-I TO B-VIII. All four years of public-school music curriculum, voice curriculum and elective. One private lesson each week; six hours of preparation. One semester credit. Assistant Professors Pasmore, Painter and Kennedy, and Misses Murphy, Brown and Thornburg.

The entrance requirements are the same as for course 172A, and instruction follows the same plan.

175A to 175D. PIANO C-I TO C-IV. This course is designed for students who cannot meet the entrance requirements for courses 170A, 172A, and 174A. No credit. The work may be done in one semester or may require longer, according to the ability and previous training of the student.

176A to 176H. PIANO ENSEMBLE I TO VIII. Required throughout the piano curriculum. One hour each week. No credit. Assistant Professors Pasmore and Kennedy.

During the first and second years this work is in classes of four, for practice in sight reading and ensemble playing. Orchestral work arranged for eight hands are the chief material used. During the third and fourth years the work is done partly in classes of four, but develops into two-piano work; training for accompaniment and ensemble with various groups of orchestral instruments.

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, Assistant Professor Gordon, and Mr. Illingworth.

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.

183. WIND INSTRUMENTS A. Elective, both semesters. One private lesson each week; six hours of preparation. One semester credit. Associate Professor Wheeler, Assistant Professor Gordon, and Mr. Illingworth.

Instruction in this course is the same as that in course 182 with but one lesson per week instead of two.

184A to 184F. RECITAL I TO VI. Sophomore, junior, and senior years. Courses I, II, III, and V, carry no credit; 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, 186B. REPERTOIRE I AND II. 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, Associate Professors Smith and Wheeler, and Mr. Lamont.

Students in the piano, violin, voice and public-school music 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.

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 Ellis 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.

### FEES IN MUSIC

*Two lessons each week for a semester:*

| | |
|---|---|
| Piano | $40, $34, $30 or $27 |
| Voice | 45, 34, 30 or 27 |
| Violin | 34, 30 |
| Other orchestral instruments | 34 |

*One lesson each week for a semester:*

| | |
|---|---|
| Piano | $22, $19, $16, $14 |
| Voice | 26, 22, 19, 16, $14 |
| Violin | 19, 16, |
| Other orchestral instruments | 19 |

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## Physical Education and Athletics

Professor AHEARN
Professor BACHMAN
Assistant Professor KNOTH
Assistant Professor CORSALUT
Assistant Professor ROOT
Assistant Professor MORRIS
Assistant WATSON
Assistant WADE

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 requiste 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. This department owns equipment valued at $12,362.

In certain courses, as shown below, a locker deposit of $2 is required. Upon return of lock, key, and towels a refund of $1.50 is made in each case.

### 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 determine the grade or class of exercises for which a students 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.

Locker deposit, $2.

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. Locker deposit, $2.

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. Locker deposit, $2.

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. Locker deposit, $2.

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. Locker deposit, $2.

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. Locker deposit, $2.

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. Locker deposit, $2.

126. FOOTBALL. Elective, second semester and summer school. Lectures and recitations, two hours. Two semester credits. 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 Corsaut.

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 Corsaut.

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. Professor Bachman.

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.

148. TEACHERS' COURSE IN PHYSICAL EDUCATION. Elective, summer school. Lectures, recitations, and practice teaching. Three semester credits. Assistant Professor Knoth.

This is a general course in physical education which touches on all the phases of physical education. It gives the teacher a good working basis upon which to conduct this work in the high school.

## 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 aims, 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 College physician.

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 classes are provided for the student needing the individual corrective work.

A suit has been adopted which consists of 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 gray cotton covert, according to a pattern approved by the Department of Physical Education. Girls should not buy their swimming suits before arriving at 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 Morris, Miss Watson, and Miss Wade.

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 one hour a week of regular gymnasium work and two hours of interpretative dancing, folk dancing, archery, tennis, hockey, basket ball, or swimming. Classes are in part held out of doors when the weather permits. Locker deposit, $2.

152A. PHYSICAL EDUCATION W-II. Freshman year, second semester. Gymnasium, three hours. One semester credit. Prerequisite: Physical Education W-I. Assistant Professor Morris and Miss Wade.

In this course the marching tactics, floor work, etc., are continued for one hour a week, and basket ball, games, interpretative dancing, folk dancing, tennis, and swimming are carried on for two hours a week. Locker deposit, $2.

153, 154. PHYSICAL EDUCATION W-III AND W-IV. Sophomore year, first and second semesters, respectively. Gymnasium, three hours. One semester credit. Assistant Professor Morris and Miss Wade.

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. Locker deposit, $2.

175. GYMNASTICS. Elective, summer school. Lectures and recitations, one and one-half hour; practical work, three hours. One semester credit. Assistant Professor Morris.

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. Locker deposit, $2.

*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. Miss Wade.

This course is intended for those who have physical defects, abnormalities, and other weaknesses. Special exercises are given to students needing individual corrective work. Locker deposit, $2.

178. FOLK DANCING. Elective, summer school. Lectures and recitations, one hour; practical work, four hours. One semester credit. Assistant Professor Morris and Miss Wade.

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 na-

tions, suitable for use in the schoolrooms, playgrounds, or gymnasiums. Locker deposit, $2.

182. PLAYGROUND MANAGEMENT. Elective, summer school. Lectures and recitations, one hour; practical work, to be arranged. One semester credit. Miss Watson.

This course includes discussions of the organization and administration of playground activities and equipment, and practical experience in conducting such activities. Locker deposit, $2.

183. ELEMENTARY SCHOOL GYMNASTICS. Elective, summer school. Lectures and practical work, six hours. One semester credit. Assistant Professor Morris.

This course consists of lectures and discussion on the principles of selection, methods of teaching, and organization of work in elementary schools; also practice of the activities used, and some practice teaching. A notebook is required.

185. INTERPRETATIVE DANCING. Elective, summer school. Class work and practical work, five hours. One semester credit. Miss Watson.

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. Locker deposit, $2.

187. TECHNIC OF BASKET BALL, BASEBALL AND HOCKEY. Elective, summer school. Lectures and recitations, three hours. One semester credit. Miss Watson.

This course is devoted to the technic of these sports, the physiological benefit derived, and the organization of each into interclass contests. Locker deposit, $2.

190. SWIMMING W. Open to all women students of the College. Both semesters. No credit. Assistant Professor Morris and Miss Watson.

This is a course in swimming in which individual instruction is given in several styles of swimming and diving. Locker deposit, $2.

## Physics

Professor HAMILTON
Professor RABURN
Professor FLOYD
Associate Professor CONVERSE
Associate Professor BRACKETT
Assistant Professor HARTEL
Assistant Professor LYON
Instructor TAYLOR *
Instructor CHAPIN
Instructor AVERY
Instructor BARSTOW

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.

As the several curricula of the College are all formulated on the assumption that a year of elementary physics will have been taken in high school, classes in this subject are provided for students who are deficient in this respect. College credit on electives is allowed for this work.

The equipment owned by this department has a value of $24,554.

* Absent on leave, year 1924-'25.

## 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, Miss Taylor, and Miss Avery.

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. Laboratory deposit, $2.50.

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: Laboratory deposit, $2.50.

130. WIRELESS TELEPHONY. Elective, both semesters. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: Elementary Physics. Assistant Professor 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.*—A series of experiments is provided in which various radio circuits are assembled by the student from standard parts, and tried out for their transmitting or receiving properties. Laboratory charge, $2.50.

133. METEOROLOGY. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Physics. Professor Hamilton or Associate 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 Floyd, Assistant Professor Lyon, and Mr. Chapin.

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: Kimball's *College Physics.* Laboratory charge, $2.50.

*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. Associate Professor Brackett, Assistant Professor Lyon.

140. GENERAL PHYSICS II. Sophomore year, second semester. Class work, three hours; laboratory, three hours. Four semester credits. Prerequisite: General Physics I. Professor Floyd and Assistant Professor Hartel.

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: Kimball's *College Physics*. Laboratory charge, $2.50.

*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, Associate Professor Brackett, and Mr. Barstow.

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: Duff's *Physics*.

*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. Associate Professor Brackett, Assistant Professor Lyon. Laboratory charge, $2.50.

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, Associate Professor Brackett, and Mr. Barstow.

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: Duff's *Physics*.

*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. Laboratory charge, $2.50.

155. DESCRIPTIVE ASTRONOMY. Elective, second semester. Class work, three hours. Three semester credits. Prerequisite: Physics. Assistant Professor Hartel.

This is an introductory course largely descriptive in character, designed primarily for those desiring such a general knowledge of the principal facts, theories, and methods of astronomy, as might be expected of every liberally educated person. At times laboratory periods may be substituted for class periods. Text: Molton's *Introduction to Astronomy,* also a pocket star guide for the study of constellations.

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 follow-

ing, 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. Laboratory deposit, $2.50.

213. ACOUSTICS. Elective, first semester. Class work, one hour. One semester credit. Prerequisite: Engineering Physics II. Professor Floyd, Associate 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 and Associate Professor Brackett.

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 radio-active substances.

235. STORAGE BATTERIES. Elective, second semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: 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.

240. TEACHERS' COURSE IN ELECTRON THEORY, ALTERNATING CURRENTS AND RADIO. Elective, summer school. Lectures and laboratory, two three-hour periods each week. Two semester credits. Prerequisite: Physics. Assistant Professor Lyon.

Theory and practice in this course are closely correlated. Laboratory exercises immediately follow or are intermixed with each lecture. Experiments include examples of demonstration, use of models, properties of alternating-current circuits, rectifiers, transformers, transmitting and receiving radio circuits, and radio sets suitable for use in high school, and the construction of these appliances may be undertaken by members of the class under the direction of the instructor.

245. RADIO MEASUREMENTS. Elective, both semesters. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: College Physics, and an elementary course in radio or the equivalent. Assistant Professor Lyon.

The work in this course is in standard radio measurements, such as the determination of tube characteristics, calculation and design of inductances and capacities, properties and designs of antennas, tuning of transmitting sets, wave lengths and calibration of receiving sets, decrement, etc. The lecture hour furnishes a certain amount of ground work for the laboratory. A student may arrange in this course to carry on an investigation in some special problem of radio.

250. MODERN PHYSICS. Elective, first semester. Lectures and recitations, two hours; library and discussions, three hours. Three semester credits. Prerequisite: One year of College Physics and one year of Chemistry. Associate Professor Brackett and Assistant Professor Lyon.

The course comprises lectures and recitations on the great physical theories. The theories involved in the recent advances in physics are reviewed critically from the historical standpoint and the evidence for and against them is discussed. The course includes attendance upon public lectures and discussions relative to the subjects which have been given during the semester and the re-

porting and criticizing of the same. Each member of the class is also assigned to read several texts and articles on modern physics and to report and discuss his findings before the class, each member reporting different material but keeping notes on the findings of all members.

FOR GRADUATES

301. RESEARCH IN PHYSICS. Elective, both semesters and summer school. One to six semester credits. Prerequisite: College Physics.

Students working for their master's degree and students preparing to enter commercial work in physics or to teach physics may be assigned to problems in original investigations. Advice and suggestions are given by the members of the Department of Physics and the material and apparatus necessary for carrying on the research are furnished. New and important fields are investigated.

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# Public Speaking

Professor HILL
Associate Professor SHINN
Associate Professor SUMMERS
Instructor MCDONALD
Graduate Assistant BURR

It is the constant effort of the Department of Public Speaking to relate the training in public speaking with the work of all other departments of the College and to harmonize it with the spirit of the College. 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.

The department seeks to place itself at the service of those various organizations of the College which desire or need its assistance, and at the service of the communities of the state. In addition to its regular courses, it aims to make itself available as far as possible for individual rehearsals. It trains the orators of the College, coaches and directs college plays, and prepares intercollegiate debating teams. Students are urged to ally themselves with the organizations representing these various activities.

The equipment of this department has a value of $396.

## COURSES IN PUBLIC SPEAKING

FOR UNDERGRADUATES

101. ORAL INTERPRETATION. Elective, both semesters. Class work, two hours. Two semester credits. Professor Hill and Associate Professor Shinn.

The purpose of the 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. DRAMATIC READING. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Oral Interpretation, or by arrangement with the head of the department. Professor Hill and Associate Professor Shinn.

This course is a continuation of Oral Interpretation and involves a more advanced study of the principles of oral interpretation and their application to platform reading.

106. EXTEMPORE SPEECH I. Freshman and junior years, and elective, both semesters. Class work, two hours. Two semester credits. Professor Hill, Associate Professor Shinn, Associate Professor Summers, Mr. McDonald, and Assistant Burr.

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 practice.

108. EXTEMPORE SPEECH II. Elective, second semester. Class work, two hours. Two semester credits. Prerequisite: Extempore Speech I, or its equivalent. Professor Hill; Associate Professor Shinn, and Mr. McDonald.

This course continues the method of instruction and the underlying theory of Extempore Speech I. Special attention is given to the specific application of the principles of the former course to particular occasions, after-dinner occasions, conventions, and other types.

115. LECTURE RECITAL. Elective, both semesters. Two semester credits. Prerequisites: Oral Interpretation and Dramatic Reading, or by special arrangement with the head of the department. Professor Hill.

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 short recitals.

121. ARGUMENTATION AND DEBATE I. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Extempore Speaking I, or by arrangement with the head of the department. Associate Professor Summers.

This course includes a systematic study of the fundamentals of argumentation as applied in debate; the making of debate outlines, collecting and organization of material, structure and style of the debate speech, and methods of refutation being especially emphasized. Each student will be given opportunity to participate in a number of classroom debates for criticism.

122. ARGUMENTATION AND DEBATE II. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Argumentation and Debate I, or by arrangement with the head of the department. Associate Professor Summers.

This course calls for study of the more technical phases of contest debating, and is intended primarily for those who expect to coach debate in high schools or colleges, or to participate in intersociety or intercollegiate debates. The outstanding problems of debate coaching, debate strategy and generalship, persuasion as used in debate, methods of increasing rebuttal effectiveness, and management of debates will be given especial attention. Each student will participate in a number of classroom debates for criticism; and will also be given some opportunity to gain experience in debate coaching or judging.

125. PARLIAMENTARY PROCEDURE. Elective, both semesters. Class work, two hours. Two semester credits. Associate Professor Summers.

College men and women are expected, in and out of college, to be able to organize and conduct meetings, and to take their part in deliberative assemblies. Three phases of the problem are emphasized: How to conduct a meeting as chairman; how to take part from the floor; and how to organize and work in committee, the chief method of present-day accomplishment in deliberative bodies. Class instruction is liberally supplemented with practice in all three fields. Text: Hall and Sturgis, *A Textbook on Parliamentary Law.*

130. DRAMATIC PRODUCTION I. Elective, both semesters. Class work, two hours. Two semester credits. Mr. McDonald.

This course is intended to answer the many fundamental questions which face every teacher and community leader when called upon to stage community entertainment. A historical background of the theater is first presented, followed by a brief study of the little-theater movement. Next are studied: how to choose a play, what material is available and where, fundamentals of directing, problems in high-school play production, suggestions and practice in the use of the equipment available in the average community, and how to improve that equipment. Actual practice in stage craft is provided. Text: Andrews and Weirick's *Acting and Play Production.*

135. DRAMATIC PRODUCTION II. Elective, both semesters. Class work, two hours. Two semester credits. Prerequisite: Dramatic Production I must precede or be taken with this course. Mr. McDonald.

Building upon Dramatic Production I, the course specializes in a study of the method of directing. One or more visits back of the scenes at important productions supplements the study of the mechanics of production. Members of the class are given experience in various capacities in the production of at least five one-act plays. A definite problem in dramatic research is worked out by each student.

140. COMPOSITION OF COMMUNITY DRAMA AND PAGEANTRY. Elective, first semester. Class work, three hours. Three semester credits. Miss Burr.

This course is designed to give information on the history of community drama and pageantry, the forms which the art has taken in different times and places, the recent and present tendencies, and the relation of the art to the modern community movement. Its place in the activities of school and church is especially stressed. Practice is given in finding materials and arranging them in proper form for community drama and pageantry production. Instruction is by class lectures, class discussion and library reference.

145. PRODUCTION OF COMMUNITY DRAMA AND PAGEANTRY. Elective, second semester. Class work, three hours. Three semester credits. Miss Burr.

Students are given training in the organization and financing of community drama and pageants, the finding of characters for definite parts, the proper relation of episodes, musical accompaniments, costuming, grouping, lighting and setting.

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## Zoölogy

Professor NABOURS
Professor ACKERT
Professor HARMAN
Associate Professor JOHNSON
Assistant Professor JEWEL
Instructor GUNNS
Instructor ZIMMERMAN
Graduate Assistant BROWN
Graduate Assistant CHEATUM
Graduate Assistant VINCENT

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 (201), Cytology (214), Advanced Embryology (220), Parasitology (208), Parasites and Public Health (218), Evolution and Heredity (217), Heredity and Eugenics (216), Human Physiology (235), 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 (219), Ornithology (230), Field Zoölogy (205), 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. The equipment belonging to the department is valued at $22,255.

## 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, Associate Professor Johnson, Assistant Professor Jewell, and Miss Zimmerman.

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. Laboratory charge, $2.50.

109. ZOÖLOGY AND EMBRYOLOGY (VET.) Freshman year, first semester. Class work, three hours; laboratory, six hours. Five semester credits. Associate Professor Johnson.

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. Laboratory charge, $2.50.

201. EMBRYOLOGY AND PHYSIOLOGY. Sophomore year, both semesters. Class work, three hours; laboratory, six hours. Five semester credits. Prerequisites: Zoöl. 105 (General Zoölogy) or equivalent, and Chem. 121 (Organic Chemistry HE). Professor Harman (Embryology) and Miss Zimmerman (Physiology.)

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 digestive, 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. Laboratory charge, $2.50.

203. ZOÖLOGICAL PROBLEMS. Elective, both semesters. One or two semester credits. Professor Nabours, Professor Ackert, Professor Harman, Associate Professor Johnson, Assistant Professor Jewell, and Miss Zimmerman.

Individual problems in heredity, parasitology, cytology, embryology, and ecology are assigned by the instructors in charge.

205. FIELD ZOÖLOGY. Elective, first semester. Class work, one hour; laboratory or field work, six hours. Three semester credits. Prerequisite: Zoölogy 105. Assistant Professor Jewell.

The work consists of the collection, identification and preservation of the various local animals with notes on their life histories, behavior and distribution. Laboratory charge, $1.50.

206. ZOÖLOGICAL TECHNIC. Elective, first or second semester. Laboratory,

three or six hours. One or two semester credits. Prerequisite: General Zoölogy (Zoöl. 105) or equivalent. Professor Nabours and 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 of taxidermy. Laboratory charge, $2.50.

208. PARASITOLOGY. Senior year, first semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisite: Zoölogy and Embryology (Vet.). 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. Laboratory charge, $1.50.

211. ANIMAL ECOLOGY. Elective, second semester. Lectures, one hour; laboratory and field work, six hours. Three semester credits. Prerequisites: General Zoölogy (Zoöl. 105) or equivalent. Assistant Professor Jewell.

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. Laboratory charge, $1.50.

214. CYTOLOGY. Elective, first semester. Lectures, two hours; laboratory, six hours. Four semester credits. Prerequisite: Zoöl. 201, or equivalent. 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. Laboratory charge, $2.50.

216. HEREDITY AND EUGENICS. Elective, first semester. Lectures and recitations, two hours. Two semester credits. Prerequisite: Zoölogy 105, or equivalent. Professor Nabours.

This lecture and reading course deals with human inheritance and the interactions of nature 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.

219. EMBRYOLOGY. Elective, second semester. Class work, two hours; laboratory, three hours. Three semester credits. Prerequisites: Zoöl. 105, or equivalent. 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. Laboratory charge, $1.50.

220. ADVANCED EMBRYOLOGY. Elective, first semester. Lectures, two hours; laboratory, six hours. Four semester credits. Prerequisites: Zoöl. 105 and 201 or 109, or the equivalent. Professor Harman.

This 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. Laboratory charge, $2.50.

225. ZOÖLOGY AND ENTOMOLOGY SEMINAR. Elective, both semesters. One semester credit. Prerequisite: Zoöl. 105, or equivalent.

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. Prerequisite: Zoöl. 105, or equivalent. Professor Nabours, Associate Professor Warren, Professor Parker, and 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. Prerequisite: Zoöl. 105. Given in 1925-'26 and alternate years thereafter. 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. Laboratory charge, $1.50.

235. HUMAN PHYSIOLOGY. Elective, first semester. Class work, three hours; laboratory, three hours. Four semester credits. Prerequisite: Zoöl. 105. Miss Zimmerman.

The fundamental principles and theories of the functions of muscle, nerve, circulation, digestion, respiration, secretion and excretion are discussed in this course. Laboratory charge, $2.50.

240. TAXONOMY OF PARASITES. Elective, first semester. Class work, one hour; laboratory, three hours. Two semester credits. Prerequisite: General Zoölogy (Zoöl. 105). Professor Ackert.

This course deals with the structure of animal parasites; relation of certain animal groups; principles of classification; and identification of parasites of man and of domestic animals.

FOR GRADUATES

301. RESEARCH IN ZOÖLOGY. Elective, both semesters and during the summer. One to five semester credits. Prerequisite: General Zoölogy (Zoöl. 105). Professors Nabours, Ackert, and Harman, Associate Professor Johnson, Assistant Professor Jewell, and Miss Zimmerman.

Individual research problems are assigned in the fields of heredity and experimental evolution, parasitology, cytology, embryology, and ecology.

## 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 and Director*
SAMUEL PICKARD, *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 20 and 21 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 the biennium 1911-'13, $75,000; for the biennium 1913-'15, $95,000; $41,240 for 1915-'17; for the biennium 1917-'19, $89,759; $138,277 for the biennium 1919-'21; $184,289 for the biennium 1921-'23; and $165,000 for the biennium 1923-'25.

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 sup-

plementary 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 was increased each year for seven years, such increase being allotted annually to each state in the proportion which the rural population of such state bore to the total rural population of all the states, providing a sum equal to such increase had been appropriated for that year by the legislature of such state, or had 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 June 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 and $26,685; for the years 1918 and 1919, $38,815 and $50,944, respectively; for the years 1920 and 1921, $63,074 and $75,203, respectively; for the years 1922 and 1923, $80,641 and $90.842, respectively; and for the years 1924 and 1925, $91,842, respectively. These sums were duplicated by an equal appropriation by the legislature of Kansas for the years named with the exception of 1924 and 1925, for each of which the legislature appropriated $82,500. In addition, from the appropriation made to the Agricultural College for all its work, $31,000 was set aside for extension work for the year ending June 30, 1923. 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, 1924, therefore, is as follows: From the federal government, through the Smith-Lever act, $101,842; from the federal government through the supplementary Smith-Lever appropriation, $29,121; from the state through the Agricultural College, $31,000; from the state direct appropriation to offset the Smith-Lever appropriation, $82,500; from county appropriations offsetting the supplementary federal Smith-Lever appropriation, $29,121; total, $273,584.

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 department of rural service was discontinued June 30, 1922. 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.

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# Institutes and Extension Schools

AGRICULTURAL EXTENSION SPECIALISTS

L. C. WILLIAMS, in Charge

L. C. WILLIAMS, Horticulture
W. R. MARTIN, Horticulture
C. G. ELLING, Animal Husbandry
R. W. KISER, Animal Husbandry
M. H. COE, Swine and Baby Beef Production
J. W. LUMB, Veterinary Medicine
E. G. KELLY, Entomology
J. H. MCADAMS, Poultry Husbandry
D. J. TAYLOR, Poultry Husbandry
A. E. OMAN, Rodent Control
ROY MOORE, Rodent Control
A. W. KNOTT, Dairy Husbandry
James W. LINN, Dairy Husbandry
E. B. WELLS, Soils
H. R. SUMMER, Crops
L. E. WILLOUGHBY, Crops
A. J. SCHOTH, Field and Garden Crops
E. A. STOKDYK, Marketing
I. N. CHAPMAN, Farm Management Demonstrator
SAMUEL PICKARD, Extension Editor
DONALD R. PORTER, Plant Pathology

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, and 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.

## EXTENSION SCHOOLS

Owing to the nature of the farm and home institutes, the demand for instruction can be met only in part, and for that reason extension schools or short courses in agriculture and home economics have been organized in com-

munities 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 two or more 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.

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 SCHEDULES

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 cooperative 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 message to all the farmers in the state. The specialist, 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.

## 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 become interested in the work of the specialists who have not been interested or reached through farmer's 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.

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*

H. UMBERGER, Dean and Director
A. L. CLAPP, District Agent
G. W. SALISBURY, District Agent
FRANK O. BLECHA, District Agent
A. F. TURNER, Field Agent

ROY E. GWIN, Allen
J. A. HENDRIKS, Anderson
JOE M. GOODWIN, Atchison
R. E. WILLIAMS, Barton
C. O. GRANDFIELD, Bourbon
CHAS. E. CASSEL, Butler
C. F. GLADFELTER, Chase
H. L. GIBSON, Cherokee
E. BRUCE BRUNSON, Cheyenne
R. R. MCFADDEN, Clark
C. R. JACCARD, Clay
L. F. NEFF, Cloud
DAN M. BRAUM, Coffey
L. L. PERRY, Comanche
W. L. TAYLOE, Crawford
H. W. KING, Dickinson
CHAS. E. LYNESS, Doniphan
H. C. COLGLAZIER, Douglas
F. W. CALDWELL, Finney
HARRY C. BAIRD, Ford
F. JOE ROBBINS, Franklin
L. M. KNIGHT, Gray
J. W. FARMER, Greenwood
A. B. KIMBALL, Harvey
RAY L. GRAVES, Hodgeman
H. F. TAGGE, Jackson
W. H. ROBINSON, Jefferson
D. E. HULL, Jewell
J. B. PETERSON, Johnson
H. L. HILDWEIN, Kingman
HERBERT MOSS, Labette
E. H. LEKER, Leavenworth
S. D. CAPPER, Lincoln
CECIL MCFADDEN, Lyon
M. L. ROBINSON, McPherson
ARTHUR L. MYERS, Marion
W. O'CONNELL, Marshall
J. E. NORTON, Meade
J. D. BUCHMAN, Miami
HAYES M. COE, Montgomery
PAUL B. GWIN, Morris
H. A. BISKIE, Nemaha
CHAS. D. THOMPSON, Neosho
GEO. W. SIDWELL, Ness
E. L. MCINTOSH, Osage
ROBT. E. CURTIS, Ottawa
CARL L. HOWARD, Pawnee
CHAS. H. STINSON, Pratt
CARL CARLSON, Rawlins
R. W. MCCALL, Reno
A. I. GILKISON, Rice
DONALD B. IBACH, Rush
E. J. MACY, Sedgwick
W. H. METZGER, Shawnee
G. L. CLELAND, Sherman
J. J. INSKEEP, Sumner
JOHN V. HEPLER, Washington
C. E. AGNEW, Washington
C. E. GRAVES, Wyandotte

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 appropriation which increased each year until 1922 when it reached its maximum and which is distributed among the states according to their agricultural population. In addition to the regular Smith-Lever appropriations, Kansas receives additional funds from the so-called supplementary Smith-Lever appropriation. This appropriation was made available immediately following the war period in order that permanent work which had been established during the war period need not be discontinued due to the inability of the regular Smith-Lever appropriations to finance it. Before the federal funds are available they must be duplicated within the state.

The state legislature appropriates at each session an amount approximately 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

* 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.

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, 1924, there are sixty active farm bureaus in Kansas, as follows:

| | | | |
|---|---|---|---|
| Allen | Dickinson | Kingman | Osage |
| Anderson | Doniphan | Labette | Ottawa |
| Atchison | Douglas | Leavenworth | Pawnee |
| Barton | Ellis | Lincoln | Pratt |
| Bourbon | Finney | Lyon | Rawlins |
| Butler | Ford | McPherson | Reno |
| Chase | Franklin | Marion | Rice |
| Cherokee | Gray | Marshall | Rush |
| Cheyenne | Greenwood | Meade | Sedgwick |
| Clark | Harvey | Miami | Shawnee |
| Clay | Hodgeman | Montgomery | Sherman |
| Cloud | Jackson | Morris | Sumner |
| Coffey | Jefferson | Nemaha | Washington |
| Comanche | Jewell | Neosho | Wilson |
| Crawford | Johnson | Ness | Wyandotte |

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.

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# Home Economics

L. MAUDE FINLEY, In Charge

MINNIE SEQUIST, Clothing
LORETTA MCELMURRAY, Clothing and Textiles
L. MAUDE FINLEY, Millinery
W. PEARL MARTIN, Home Health and Sanitation
MRS. HARRIET W. ALLARD, Household Management
CONIE FOOTE, Foods and Nutrition
GEORGIANA SMURTHWAITE, Foods and Nutrition

There are approximately 800 women who annually receive instruction in home economics at the Agricultural College, and there are many thousands throughout the state who have had the advantages of resident instruction either in this or some other institution through the services of the Extension Department. While thousands have received instruction in home economics either through the resident department or through the Extension Department, this is a small number when compared to the great majority of women and girls in the state to whom such work has not been available. To give as much assistance as possible to this vast majority of women is the aim of the Department of Home Economics 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, and by means of personal correspondence. During the institute season, from January to March,

four women give lectures and demonstrations before farm and home institutes. From March to September, inclusive, the same specialists carry on intensive project work with the farm women in the state in county institutes, in special extension schools and judging at fairs. 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 are held throughout the year as a means of carrying on the regular project work.

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## Home Demonstration Agent Work

AMY KELLY, State Leader
ELLEN BATCHELOR, Assistant State Leader
FLORENCE D. SYVERUD, Allen County
ETHEL MCDONALD, Bourbon County
SARAH FRANCIS SMITH, Cherokee County
ELIZABETH QUINLAN, Clay County
MILDRED SMITH, Douglas County
NINA HURLBERT, Franklin County
MABEL E. HINDS, Labette County
————, Meade County
MRS. LILA S. COE, Montgomery County
HATTIE ABBOTT, Pratt County
EDITH HOLMBERG, Reno County
MRS. JULIA KIENE, Shawnee County
MRS. LAURA WINTER, Sedgwick County
MAUDE COE, 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 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 guaranteed by the city or county at the time the services of a home demonstration agent were requested. These agents were called emergency home demonstration agents. Before the end of a year there were twenty-five of these agents in the state. The emergency fund was discontinued June 30, 1919.

In the early days the work of the emergency home demonstration agents was instituted under the auspices of city or county organizations, but after following this plan for a short 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 August, 1918, farm-bureau counties which have requested home demonstration agents have been organized on the basis of an ideal farm bureau; that is, the women have been taken into the farm bureau as regular members, having all the rights and privileges, and have become part of the working organization. In such counties the work of the home demonstration agents is taken up as part of the regular extension program, which includes the development of farm activities, home activities, and community activities. There are ten counties organized with an extension program which includes the home demonstration agent.

During the war the program of work for the home demonstration agent was suggested largely by the Federal Food Administration, but at the close of the war the program was based on the needs of the communities in the county and was evolved through the community, committee and mass meetings. Today each county has a county program of work based on the needs of the communities in the county, and this is a part of the state program. The home demonstration agent, in coöperation with the Agricultural College and United States Department of Agriculture, works to carry out the community, county and state 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.

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# Boys' and Girls' Club Work

R. W. Morrish, State Club Leader
Charlotte Biester, Assistant State Club Leader

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 the boys and girls in some 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 supervise the work of the club members and assist with club meetings. 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 or other College representatives. Written material is prepared by the College specialists and sent out by the state club leader through the Extension 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 and home 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 regularly once per month with their local and county leaders to consider various matters pertaining to their different demonstrations. Through the organization of the club, much valuable experience in leadership is gained 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. Beginning with 1923 the practice of holding the Boys' and Girls' Club Week at Manhattan in connection with Farm and Home Week was discontinued. As was the case this year, hereafter an annual "Round-up" of junior club members will be held each spring.

A special feature of the year's club program is the Annual Boys' and Girls' Club Round-up held in June. This is held at the Agricultural College and the boys and girls are given a week's instruction by the College faculty. Any boy or girl club member is eligible to attend, but as a rule the attendance is largely of county and state champions.

# Rural Engineering

WALTER G. WARD, Extension Architect, in Charge
CLAUDE K. SHEDD, Extension Engineer

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 each year a considerable portion of the farm buildings of Kansas need replacing or remodeling, and, due to the increased costs of labor and the necessity for farm buildings to be more efficiently located, the opportunity is presented to arrange the farmstead and buildings more conveniently. 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 when requests are made for special trips. Then a charge for travel and local expenses is made.

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# Home-study Service

CORRESPONDENCE STUDY

GEORGE GEMMELL, Head of Department
CHARLES NITCHER, Animal Husbandry
B. H. FLEENOR, Education
FLOYD PATTISON, Industrial Subjects
ADA BILLINGS, History and Civics
MRS. MARCIA HALL, English
EARL LITWILLER, Horticulture
MRS. ETHEL J. MARSHALL, 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 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 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 text-books, drawing instruments, stationery and other materials required in their courses, and to pay postage on 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 Feeding.
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 15. Small Fruits.
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.
EA 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 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 7. Farm Buildings.
EI 8. Concrete Construction.
EI 10. Farm Machinery.
EI 11. Steam Boilers and Engines.
EI 12. Gasoline Engines.
EI 13. Blacksmithing.
EI 15. Highway Construction.
EI 17. Automobiles.
EI 18. Machine Shop Work.
EI 19. Bridge and Culvert Construction.
EI 20. Elementary Woodworking.
EI 23. Gasoline and Oil Traction Engines.
EI 25. Plumbing.
EI 26. Practical Electricity.
EI 27. Sheet Metal Drafting.
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 assignment* | *Unit H. S. credits* |
|---|---|---|---|
| | 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 |

| | *Number of assignment* | *Unit H. S. credits* |
|---|---|---|
| **HISTORY** | | |
| PCH-A. Ancient History | 20 | ½ |
| PCH 3. Medieval History | 20 | ½ |
| PCH 4A. Modern History I | 20 | ½ |
| PCH 4B. 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 |
| PCH 9. Economics | 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 | 20 | ½ |
| PCS 4. Physiology | 20 | ½ |

## College Credit Courses

### DIVISION OF AGRICULTURE

| | *Semester credits* | *Assignments* |
|---|---|---|
| **AGRONOMY** | | |
| CA 3. Farm Crops | 3 | 24 |
| **ANIMAL HUSBANDRY** | | |
| CL 2. History of Breeds | 2 | 16 |
| 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 |
| CH 6. Small Fruits | 2 | 16 |
| **POULTRY HUSBANDRY** | | |
| CPP 1. Farm Poultry Production | 1 | 8 |

### DIVISION OF ENGINEERING

| | | |
|---|---|---|
| **APPLIED MECHANICS** | | |
| 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 9. Steam Turbine Practice | 3 | 27 |
| CE 10. Essentials of Steam and Gas Power Engineering | 2 | 16 |

### 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

| | | *Semester credits* | *Assignments* |
|---|---|---|---|
| | **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. | School Management | 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 | 2 | 16 |
| CP 14. | Vocational Education | 3 | 24 |
| | **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 |
| CCE 6. | English Literature | 3 | 24 |
| | **HISTORY AND CIVICS** | | |
| CHC 1. | Community Civics | 2 | 16 |
| 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 |
| | **PHYSICAL SCIENCE** | | |
| CG 1. | General Geology | 3 | 24 |

# 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 Agricultural 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 Agricultural 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 one hundred projects, covering practically all phases of agriculture investigation, are being studied by the members of the Agricultural Experiment Station Staff.

The farms, live stock, laboratories, and general equipment of the College are all directly available for the use of the Agricultural Experiment Station.

The results of the work of the Station are published in the form of bulletins, circulars, and scientific papers. 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 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 Agricultural 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 the State Entomological Commission. (Laws of 1907, ch. 386; 1909, ch. 27.) This commission, created in 1907, was established—

"To suppress and eradicate San Jose 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 entomologists, 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.

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."

It will thus be seen that the state of Kansas is making increasing use of the scientific staff of the Agricultural 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 demonstration 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 rotation 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 Agricultural 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 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 the 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: Tests of automatic ventilators; heating systems for the prevention of insect infestation in flour mills; the use of corn as a fuel; concrete used in highway construction; temperature stresses in rigid pavement slabs; air resistance to motor vehicles; farm sewage-disposal systems; and radioactivity of gas-well borings.

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.

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 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:

Factors influencing calcium and phosphorus storage in children on an adequate diet.

Factors influencing the seasonal growth curve of children.

A study of relationship of working heights to fatigue and energy expenditure.

The vitamin C content in common canned fruits.

A study of the calcium storage during pregnancy.

A study of the coefficient of protection of clothing fabrics.

An investigation of the relationship between the source of income of the family and the economic and social standards of the farm women.

# Special Courses

## Short Courses in Agriculture

### Farmers' Short Course

Kansas State 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. For 1926 the session will begin Monday, January 4, and close Saturday, February 27. 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 Marketing | 3(3-0) |
| Farm Accounting | 3(2-2) |
| Farm Insects and Rodents | 2(2-0) |
| Dairying II | 5(3-4) |

It is also possible to elect a limited amount of work in carpentry, blacksmithing, or gas engines and tractors.

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) |

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 $1.50. This latter fee entitles him to free medical attendance by the College physician. In several of the laboratories, laboratory deposits or charges varying from 50 cents to $1 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 stock-judging 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. Laboratory deposit, $1.

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. Laboratory charge, 50 cents.

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. Laboratory charge, 50 cents.

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 disease 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. Laboratory charge, 50 cents.

FARM MARKETING. (Ag. Ec. 2.) The work in this course consists of a study of marketing functions and services, and a means of improving the methods of marketing farm products. Considerable attention is given to coöperation as a means of improving the marketing of farm products.

FARM ACCOUNTING. (Ag. Ec. 3.) This course endeavors to acquaint the student with records which the farmer should keep, methods of keeping these records, and ways of utilizing the information given by the records. In the laboratory, exercises are given dealing with inventory, crop, live stock, labor, and other accounts using figures obtained from Kansas farms. The practice work shows methods of keeping accounts and analyzing their results. Necessary account books, accounting forms, and supplies for laboratory use are furnished the student. Laboratory charge, 50 cents.

FARM INSECTS AND RODENTS. In this course methods of controlling serious insect pests of the farm, garden and orchard and those affecting domestic animals are discussed, emphasizing the importance of clean culture and good farm methods. The control of common rodents injurious to the farmer, especially gophers, prairie dogs, rats, mice, moles, and rabbits, is given due emphasis.

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; co-operative 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, eight weeks in length, 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 new College creamery, which is operated on a commercial basis, provides unusual facilities for this training. The equipment is complete and of the latest design. The work is in direct charge of experienced well-trained creamerymen. 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 | 3(2-2) |
| 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 $1.50. 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 certificates.

### 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.

## 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 first 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 the meaning of these terms in relation to quality in wheat and flour.

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.

## 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 begins the first Monday in December each year.

The program consists of lectures and laboratory studies on care, feeding, and management of dairy cattle; judging and showing, history of dairy breeds and pedigree analysis, sanitation, milk testing, cheese and farm butter making, and the production of crops on the dairy farm. The work is just as practical in nature as it is possible to make it and is especially recommended for men who handle pure-bred cattle, or wish to become cow testers and test-cow milkers. No fees are charged for the course, and as no textbooks are required the only cost will be that incidental to living in Manhattan for two weeks.

### 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 28, 1925, and close January 8, 1926.

The primary purpose of this course is to offer instruction that will help breeders, particularly beginners, in the pure-bred cattle business, by giving them an opportunity to study blood lines and the fundamentals of mating, feeding, and selling. 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 should be made in advance. Write to the Department of Animal Husbandry, K. S. A. C., Manhattan, Kan.

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## Short Courses Related to Engineering

Automobile Operation
Automobile Repair
Tractor Operation
Foundry Practice
Carpentry
Machine-shop
Blacksmithing
Electrical Repair

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 on the first Monday after the first of January only. Students may enroll in any of the other seven special short courses on the last Monday of September and the first Monday after the first of January.

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 $1.50 for the eight-week courses, or $3 for the longer courses, is also charged, and entitles the student to free medical attendance from the College physician. 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 laboratory charges at any time without notice.

A certificate will be issued to those students in the short courses related to engineering who satisfactorily complete the prescribed work.

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 are 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. Laboratory charge, $3 per week.

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. Laboratory charge, $3 per week.

TRACTOR OPERATION. This course covers a period of eight weeks, and treats of the construction, operation, and adjustment of modern farm 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 repair, and power field machinery.

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 tractors; stationary gas engines; various types and makes of tractor field tools; and a practical repair shop equipped with standard tools. Laboratory charge, $3 per week.

CARPENTRY. A practical study lasting twelve weeks 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. Laboratory charge, $1.50 per week.

MACHINE-SHOP. This course in machine-shop work covers a period of twelve weeks and 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. Laboratory charge, $3 per week.

FOUNDRY PRACTICE. This course, which lasts twelve weeks, 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. Laboratory charge, $1.50 per week.

BLACKSMITHING. A practical course of twelve weeks duration 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 process of welding. Laboratory charge, $3 per week.

ELECTRICAL REPAIR. This course is intended to train electricians, and includes electric wiring, and the operation of dynamos, motors, and other electrical equipment. Duration, one or two months. Laboratory charge, $3 per week.

# One- and Two-year Courses in Trades Related to Engineering

The following one- and two-year courses have been arranged for those who can spend more time in the study of their selected trade than is given in the eight- and twelve-week courses covering the same subjects, and who find it impossible, because of insufficient preliminary training or for other reasons, to take a more extended course leading to a degree. The purpose of these one- and two-year trade courses is to give the student a practical working knowledge of one of the trades and in addition to give him work in English, shop arithmetic, shop drawings and other studies which are essential to its successful application. Each of the several courses is intensely practical, well rounded, and should prove profitable to any who desire a thorough training in a trade course. A certificate will be granted to each student satisfactorily completing the prescribed work. These courses begin on the same date as the regular college work. The laboratory charges are prorated on the same basis as for the Special Short courses.

REQUIREMENTS FOR ADMISSION. Students entering any of the one- and two-year trade courses should have completed the eighth grade in common-school education, or its equivalent.

ONE-YEAR TRADE COURSE IN AUTOMECHANICS. This course requires two college semesters, each of eighteen weeks, and one summer session of nine weeks for its completion. The work as outlined covers, during the first semester, the mechanical section of automechanics, the electrical section of automechanics, the repair section of automechanics, electrical work, repair work, soldering and babbitting, machine-shop work, blacksmithing, tractor operation, and carpentry. During the second semester, work is taken in vocational English, practical arithmetic, vocational drawing, oxyacetylene welding, machine-shop work, and storage-battery repair. During the summer session the outline includes shop calculations, shop management, foundry, automobile painting, automobile trimming, automobile repair, automobile electrical work, carpentry work, and advanced machine-shop practice.

TWO-YEAR TRADE COURSE IN CARPENTRY. Two College years of thirty-six weeks each and two summer sessions of nine weeks each are required to complete this course. During the first year, carpentry, blacksmithing, machine-shop work, vocational English, practical arithmetic, vocational drawing are studied. The two summer sessions are devoted entirely to practical carpentry. During the second year advanced shop calculations, vocational English, vocational drawing, building details and practical carpentry are taken.

ONE-YEAR TRADE COURSE IN BLACKSMITHING. This course requires two semesters of eighteen weeks each and one summer session of nine weeks before completion. During the first semester, twelve weeks are devoted to blacksmithing, followed by machine-shop work, soldering and babbitting, and carpentry. During the second semester, vocational English, practical arithmetic, vocational drawing, oxyacetylene welding, machine shop and advanced blacksmithing are taken. During the summer session the work covers shop calculations, shop management, and advanced blacksmithing.

ONE-YEAR TRADE COURSE IN FOUNDRY PRACTICE. This course requires two semesters of eighteen weeks each and one summer session of nine weeks before completion. During the first semester, twelve weeks are devoted to foundry practice, followed by practice in blacksmithing and machine-shop work. During the second semester the following subjects are taken: Vocational English, practical arithmetic, vocational drawing, oxyacetylene welding, and advanced machine-shop practice. During the summer session the time is devoted to shop calculations, shop management, and advanced foundry practice.

TWO-YEAR TRADE COURSE FOR MACHINISTS. Two College years of thirty-six weeks each and two summer sessions of nine weeks each are necessary to complete this course. The first year's work is devoted to elementary machine-shop practice, soldering and babbitting, foundry, blacksmithing, vocational English, practical arithmetic, vocational drawing. During the summer session following the first year the entire time is devoted to machine-shop practice. During the second year advanced work is given in shop calculations, vocational English, vocational drawing, oxyacetylene welding, machine-shop practice, jig and fixture design, shop management, and trade electives. The final summer session at the end of the second semester is devoted to advanced machine-shop practice and trade electives.

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# Short Course 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 may be admitted without presentation of credentials.

### 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. Laboratory fee, $4; key deposit, 25 cents.

2. SEWING. Both semesters. Laboratory, nine 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. Undergarments, children's garments, and a dress are made. Notebook work is required. Key deposit, 25 cents.

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. Key deposit, 25 cents.

5. FLORICULTURE. Both semesters. Class work, two hours.

Lectures in the class room 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 care of clothing, the planning of expenditures, buying of supplies, and keeping of accounts.

# Degrees and Certificates Conferred
## In the Year 1924

## FIRST DIVISION, MAY 29

## DEGREES CONFERRED

### GRADUATE COURSES

MASTER OF SCIENCE

Maxwell Newton Beeler, B. S. A., University of Missouri, 1915
Mary Loretta Callahan, B. S., Kansas State Teachers College of Hays, 1921
Nelle Dwyer Flinn, B. S., Kansas State Agricultural College, 1916
John Arthur Glaze, B. S., Kansas State Agricultural College, 1923
Paul Wallace Gregory, B. S., University of Kentucky, 1922
Edith Gabriella Grundmeier, B. S., Kansas State Agricultural College, 1922
Harold Reed Guilbert, B. S., Kansas State Agricultural College, 1920
Mildred Josephine Halstead, B. S., Kansas State Agricultural College, 1922
Lawrence William Hartel, A. B., Central Wesleyan College, 1911
Ernest Hartman, B. S., Kansas State Agricultural College, 1922
Sterling Brown Hendricks, B. Ch. E., University of Arkansas, 1922
Gilford John Ikenberry, B. S., Kansas State Agricultural College, 1920
Charles Otis Johnston, B. S., Kansas State Agricultural College, 1918
Caroline Rosina Kesler, A. B., Friends University, 1920
Mary Aletha Mason, B. S., Kansas State Agricultural College, 1919
Dudley Bertie David Moses, B. S., University of Illinois, 1923
John Wesley Patton, D. V. M., Agricultural and Mechanical College of Texas, 1921
Nannie Clytice Ross, B. S., Kansas State Agricultural College, 1916
Joseph Prestwich Scott, D. V. M., Ohio State University, 1914
Ralph Robinold St. John, B. S., Kansas State Agricultural College, 1917
Ellis Adolph Stokdyk, B. S., University of Wisconsin, 1920
Rolland Hays Waters, A. B., Baker University, 1914
George Benson Watkins; B. S., University of Michigan, 1921
Fred Erie Whitehead, A. B., Baker University, 1918

CIVIL ENGINEER

Harry Kenneth Shideler, B. S., Kansas State Agricultural College, 1921

ELECTRICAL ENGINEER

Robert Albert Graves, B. S., Kansas State Agricultural College, 1920

MECHANICAL ENGINEER

George Luther Christensen, B. S., Kansas State Agricultural College, 1894
Seibert Fairman, B. S., Kansas State Agricultural College, 1919

## UNDERGRADUATE CURRICULA

### Division of Agriculture

BACHELOR OF SCIENCE IN AGRICULTURE

Frank McDaniel Alexander
Anthony Paul Atkins
George Smith Atwood
Ellis Buchanan Babbit
Marvel Leon Baker
Alvin Kornelius Banman
Murlin Clyde Barrows
Guy Charles Bartgis
Virgil Arthur Berridge
Dan Matthew Braum
Joseph Daniel Buchman
Hiram Gilbert Burt
Boyd Ransom Churchill
Walter Tanner Crotchett
Edgar William Davis
Samuel Wesley Decker
Lloyd Eugene Deister
Charles Orville Dirks
Jack Wilbur Dunlap
John William Egger
Lester Edgar Erwin
James Lyster Farrand
George Albert Filinger
Kenney Lee Ford
Clarence Fay Gladfelter
Irwin Lloyd Hathaway
Edwin Hedstrom
Russel Carl Hoffman
Max Manley Hoover
Benjamin Francis Houlton
Charles Bannus Hudson
Charley Archer Jones
Henry Daniel Karns
Louis Donald Keller
Fred Franklin Lampton
Earl Milo Litwiller
Howard Hutcheson McGee
Earl Jeremiah McWilliams
Joseph Taylor Mackay
Aden Combs Magee
Jose Angel Mier
Buford John Miller
John Kenneth Muse
Walter Emory Myers
Carl Otto Nelson
Dorothy Elizabeth Lush Nelson
Robert Thomas Patterson
Otto LeRoy Pretz
Ernest Lee Raines
Roger Eli Regnier
Ernest Leo Reichart
Max Duane Roberts
Paul Gibbons Roofe
Lawrence Arthur Schaal
Everette Clifford Scott
Ralph William Sherman
Maurice Burnett Spear
Thomas Bruce Stinson
Austin William Stover
Raymond Luther Stover
Daniel Overton Turner
Verne Leon Uhland
Walter Henry von Trebra
George Russell Warthen
Edward Watson
Maurice Marion Williamson
Oral Martin Williamson
Cecil Cline Wilson
Philip Redding Woodbury
Bernie William Wright

### Division of Veterinary Medicine

DOCTOR OF VETERINARY MEDICINE

George Thomas Bronson
Francis Paul Burke
Charles James Coon
Edward Raymond Frank
Ernest Eugene Hodgson
Gilbert Raymond Killian
Gustave Louis Krieger
George Ely Martin
William Taylor Miller
Raymond Montrose Williams

### Division of Engineering

BACHELOR OF SCIENCE IN AGRICULTURAL ENGINEERING

Ralph Waldo Baird
Jesse Harold Neal
William Joseph Welker

BACHELOR OF SCIENCE IN ARCHITECTURE

Neal Dwight Bruce
Claude Raymond Butcher
William James Hartgroves
James Franklin Johnson
William Crawford Kerr
Raymond Charles Lane
Ivan Harris Riley
Henry Evert Wichers
Fred Emery Wilson

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

George Randolph Anderson
Francis Neil Brooks
Maurice Wainwright Casad
William Kenneth Dinklage
Henry Dougherty, Jr.
Willis Lee Farmer
John Silver Fuller
Ira David Sankey Kelly
LeRoy Markle Leiter
Willis Lloyd Lesher
Guy Archibald Murray
Harold William Retter
John Calvin Riddell
Eben Ellsworth Scholer
Robert Theodore Shideler

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Maurice Egbert Bivens
Guy Emerson Buck
Verne Ole Clements
Metheny John Copeland
Otis Frederick Fulhage
Clark Knight Gibbon
Alvin Bentley Haines
Fred Earl Henderson
James Norman Hume
George Danial Lingelbach
William Karl Lockhart
Clarence Joseph Lydick
Henry John Melcher
Alva Ernest Messenheimer
Edgar Louis Misegades
Ralph Henry Peters
Herbert Arthur Rose
Paul Morse Shaler
Ray Leonel Smith
Frank Edward Walbridge
George Herman Weckel
Floyd Lavern Werhan
Thelbert Leroy Weybrew
Howard Williams
Mannie Ray Wilson
Raymond Yoder

BACHELOR OF SCIENCE IN FLOUR-MILL ENGINEERING

Theodore Thomas Hogan
Royce Owen Pence
Clarence Martin Spencer

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Harley Kercher Burns
Thomas Alfred Constable
Lewis Brown Deal
Richard Eugene Jansen
Carroll Mendenhall Leonard
Daniel Gail Lynch
Frank Miller
Bud Wesley Morford
George Vernon Mueller
Lester Ralph Sellers
Nathan James Simpson
John Hollis Tole
John Wesley Wasson

## Division of Home Economics

BACHELOR OF SCIENCE IN HOME ECONOMICS

Ethel Charlotte Adam
Vida Baker
Mary Grace Boone
Jewel Irene Conkel
Mildred Althea Conkel
Gertrude Conn
Stella Grace Cook
Bessie May Coulter
Launa Myrle Divelbiss
Medrith Droll
Helen Vare Dunlap
Mildred Faye Emrick
Irene Antoinette Etzold
Mary Catherine Etzold
Bertha Faulconer
Bernice May Flemming
Ada Elizabeth Fullinwider
Veneta Frances Goff
Grace Felicia Headrick
Polly Hedges
Beulah Frances Helstrom
Opal Wishard Hepler
Elmira Wesson King
Marie Helen Lamson
Syble Ingovar Leighton
Mollie Lindsey
Ruth Viola Luginbill
Ethyl Mills
Louise Morse
Meria Kathleen Murphy
Margaret Nettleton
Jessie Adelaide Newcomb
Margaret Elizabeth Raffington
Marian Elizabeth Randles
Helen Elizabeth Reid
Mary Jane Roesener
Mary Katharine Russell
Emelie Louise Schneider
Zella Kouns Smith
Katharine Pearl Spiker
Rachel McCune Steuart
Euphemia Faith Strayer
Florence Ellen True
Ethel Florence Trump
Rowena Turner
Nina Winella Uglow
Nora Elaine Watters
Winifred West
Margaret Maxwell White
Susanna Whitten
Adelaide Louise Wieters

## Division of General Science

BACHELOR OF SCIENCE

Madalyn Avery
Edith Elizabeth Barrett
Ivan Dewey Bennett
Lucia Biltz
Verna Breese
Mary Penelope Burtis
Floyd Charles Butel
Ina Butts
William Amy Conrow
Victor Vincent Cool
George William Corbet
Marie Correll
Elizabeth Lida Curry
Eleanor Hannah Davis
Leonora Katherine Doll
Addison Forrester
Martin Frederick Fritz
Queenie Esther Hart
Loren Bryce Hefling
Randall Conrad Hill
Grace Irene Hinnen
Glenn Oscar Hoffhines
Lelia Mary Hughes
Mary Eleanor Jensen
Bernice Lake Johnson
Lee Travis King
Vivian Hazel Larson
Ruth Evangeline Leonard
John Oliver McIlwaine
Vivian Anna Marley
Alice Tweed Marston
Faith Martin
Ruby May Northup
Raymond Covert Plyley
Ruth Rachael Rannells
Robert Smith Rath
Doris Ione Riddell
Sylvia Lanora Russell
Ira Ferdinand Schindler
John Steiner
Logan Byron Warlick

BACHELOR OF SCIENCE IN INDUSTRIAL CHEMISTRY

Benjamin Hederstrom Dutton
Ignacio Mendoza Cantos Ortiz
Alfred Lee Rapp
Ivan Venton Wilson

BACHELOR OF SCIENCE IN INDUSTRIAL JOURNALISM

Dahy Baskett Barnett
Nelson Suplee Barth
Lenore Faydette Berry
Francis Eugene Charles
Alan Davis Dailey
Milton Stover Eisenhower
Josephine Frances Hemphill
Olive Hazel Hering
Julia King
Velma Mary Lawrence
Izil Isabel Polson
Margaret Marion Reasoner
Morse Henderson Salisbury
Ralph Jessup Shideler
Mildred Pauline Swenson
Helen Margaret Van Gilder

BACHELOR OF MUSIC

Bernice Elma Hedge
Orpha Eilleen Russell
Lavina Amelia Waugh

BACHELOR OF SCIENCE IN RURAL COMMERCE

Alice Burton Carney
Solomon McCammon Finney
Albert Arthur Goering
Emmor Weir Hall
Robert Greenwood Merrick, Jr.
Dewey Newcombe
James Edward Parker
William Everett Wareham
Gilberta Woodruff
Harrol Veere Zimmerman

# COMMISSIONS AWARDED

SECOND LIEUTENANT, OFFICERS' RESERVE CORPS

George Randolph Anderson
Alfred Lewis Arnold
Ralph Waldo Baird
Hugh Carl Bryan
Francis Paul Burke
Grovener Cecil Charles
Roy Arthur Coe
Henry Dougherty, Jr.
Millard Reuben Getty
Charles Clayton Griffin
James Norman Hume
Bion Shepherd Hutchins
Irwin Ingram
Hal Francis Irwin
Conrad Hasting Johnson
John Arthur Johnson
Charles Archer Jones
Henry Daniel Karns
William Crawford Kerr
Gilbert Raymond Killian
Raymond Charles Lane
James Waggoner Lansing
E. R. Lord
Clarence Joseph Lydick
Henry Landon McCord
Jesse Harold Neal
Harold William Retter
Samuel Lewis Smith
Myron Homer Soupene
George Herman Weckel

# CERTIFICATES AWARDED

## CERTIFICATE IN FARMERS' SHORT COURSE

Horace Marshall Abraham
Raymond Allee
Clarence Albert Anderson
John Frederick Berg
Robert Lewis Elfstrom
Carl Elsworth Gardner
John Wilbur Garnett
Julius Edwin Gigstad
Rulie Cyrus Lee
Evan Shields Lewelling
James Wylie Logan
Abbott Miles Morton
Clay Hardin Newell
Perly Pederson
Samuel Solomon Penner
John Elliott Sanderson

## CERTIFICATE IN TWO-YEAR TRADE COURSE FOR MACHINISTS

Noble Marrol Allm
John Thomas Azbill
George Luther Bell
Lloyd Harris
Lester Raymond Welsh

## CERTIFICATE IN ONE-YEAR TRADE COURSE IN AUTOMECHANICS

Amos Fagan
Andrew Donald MacArthur
Elbert Earl Meldrum

## CERTIFICATE IN AUTOMOBILE OPERATION

John William Gehrke
Robert Henry Gump
Charlie Law
James Lester Schwab
James Patrick Woods

## CERTIFICATE IN AUTOMOBILE REPAIR

Charles William Black
Walter Raleigh Black
Walter Eugene Clinton
Arthur Edmond Diggs
Richard Holmes Dobbs
Corwin Hamilton Funk
John Holm
Lawrence Timothy Martin
Lester Theodore Milligan
William Allen Mossman
Percy Omo
Gust Lyfeid Peterson
Frederick Orion Pickle
Homer Edward Reid
LeRoy Richards
Victor Vermillion
Robert Walker Wortham

## CERTIFICATE IN BLACKSMITHING

Peter Lohrentz

## CERTIFICATE IN CARPENTRY

Herman Rowe
Eric Thompson

## CERTIFICATE IN ELECTRICAL REPAIR WORK

James Lewis Barry
Nolan Douglas Basore
Derbin Blair
Howard Kenith Coder
Clifford Dodge
Joseph Emil Krasney
Ernest Isaac Lewis
William Allen Millikan
Allan Yorke

## CERTIFICATE IN MACHINE-SHOP WORK

Clarence Ernest Colglazier
Kenneth Ralph Howser
William Allen Millikan
William Pears

## CERTIFICATE IN TRACTOR OPERATION

Paul Herbert Klein

## CERTIFICATE IN HOUSEKEEPERS' SHORT COURSE

Elsie Boehner
Lena Cook
Doris Handlin
Mattie May KampSchroder
Minnie Krasny
Mildred Matosh
Dorothea Mueller
Mary Mullen
Margaret Marie Nonken
Margeret Ritz

## CERTIFICATE IN PUBLIC SCHOOL MUSIC

Jessie Ellen Bogue
Anna Katherine Champeny
Thelma Elizabeth Coffin
Helen Florence Kirk
Mildred Loy
Wilda Aileen Rhodes
Bernice Marie Rogers
Flora Louise Scott
Marjorie Lee Shultice
Luella Inez Varner
Mildred Fern Young

# SECOND DIVISION, JULY 31

## DEGREES CONFERRED

### GRADUATE COURSES

MASTER OF SCIENCE

Margaret Ahlborn, A. B., University of Kansas, 1906
Marvel Leon Baker, B. S., Kansas State Agricultural College, 1924
Emily May Bennett, A. B., University of Illinois, 1921
Ferdinand Hugo Bosman, B. S., Transvaal University-College, 1924
Harry Ray Bryson, B. S., Kansas State Agricultural College, 1917
Ruth Aileen Campbell, A. B., Drury College, 1923
Marie Correll, B. S., Kansas State Agricultural College, 1924
Frederick Earl Emery, D. V. M., Kansas State Agricultural College, 1923
Frank Pletcher Root, B. S., Kansas State Agricultural College, 1914
Bertha Snyder, A. B., Southwestern College, 1923
Srboljub Rad Todorovic, B. S., University of West Virginia, 1923
Wilbur Ellis Watkins, B. S., McPherson College, 1923
Henry Evert Wichers, B. S., Kansas State Agricultural College, 1923
Edwin William Winkler, B. S., Kansas State Agricultural College, 1921
Mary Abbie Worcester, B. S., New Hampshire College, 1917

### UNDERGRADUATE CURRICULA

#### Division of Agriculture

BACHELOR OF SCIENCE IN AGRICULTURE

Glenn Allen Aikens
Lawrence Floyd Barth
Thomas Walter Bruner
Burton Ellsworth Colburn
Samuel Peter Gatz
Charles Clayton Griffin
Ray Dryer Hahn
George Elwin Hendrix
Austin Theodore Heywood
Wilbur William Humphrey
Reese Gardner Lewis
James Richard Moreland
Albert Diedrich Mueller
Morris Emory Rowe
Richard Raymond Stucky
William Henry Teas
Chester De Belle Tolle

#### Division of Veterinary Medicine

DOCTOR OF VETERINARY MEDICINE

Ralph Wesley Boone
Earl Fremont Hoover
Ramon Quintin Javier
Ernest Carr McCulloch
Andrew John Miller

#### Division of Engineering

BACHELOR OF SCIENCE IN ARCHITECTURE

Herman Thompson Hunter

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

Raymond Walstein Binford
Robert Franklin Blanks
George Stuart Davis
LaMotte Grover
Floyd Chester Healea
John Camp Wilkins

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Earl Abbott
Harold Benton Axtell
Herbert Melvin Low
Joseph Frank Swarner

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Henry Landon McCord
Glen Ransom Sawyer
William Wesley Trego
Floyd Jacob Tucker

### Division of Home Economics

BACHELOR OF SCIENCE IN HOME ECONOMICS

Dorothea Schloh Ackley
Maurine Esther Ames
Helen Ann Blair
Mary Jane Clark
Grace Marie Currin
Beatrice Edith Gaither
Nellie June Harter
Wilda Marguerite Hay
Esther Alden Huling
Mae Amelia Humphrey
Ila Thelma Knight
Mary Belle Logan
Frances Emily Mardis
Harriett Eloise Monroe
Zoe O'Leary
Edith Viola Reece
Mayetta Roper
Edna Josephine Spickerman
Lola Beatrice Vincent

### Division of General Science

BACHELOR OF SCIENCE

Werner Jesse Blanchard
Ernest Arthur Laude
Mary Hope Morris
Margaret Teresa Rochford
Glenn Lionel Rucker
Mary Kinnis Wilson

BACHELOR OF MUSIC

Eunice Miriam Anderson
Clara Luella Howard

BACHELOR OF SCIENCE IN INDUSTRIAL JOURNALISM

Erma Lucille Kinnamon
Karl Marx Wilson

BACHELOR OF SCIENCE IN RURAL COMMERCE

Elmer Eugene Archer
David Pollock Hervey

## CERTIFICATE AWARDED

CERTIFICATE IN PUBLIC SCHOOL MUSIC

Eunice Miriam Anderson

# HONORS

## PHI KAPPA PHI

### CANDIDATES FOR THE MASTER'S DEGREE, 1924

Maxwell Newton Beeler
Emily May Bennett
Florence Miller Bruner
Harry Ray Bryson
Paul Wallace Gregory
Harold Reed Guilbert
David Leslie Mackintosh
Mary Aletha Mason
Dudley Bertie Davis Moses
Loyal Frederick Payne
Ralph Robinold St. John
Joseph Prestwich Scott
Bertha Snyder
George Benson Watkins

### GRADUATES, CLASS OF 1924

#### Division of Agriculture

Frank McDaniel Alexander
Marvel Leon Baker
Daniel Matthew Braum
Thomas Walter Bruner
Charles Orville Dirks
Max Manley Hoover
Earl Milo Litwiller
Ralph William Sherman
Raymond Luther Stover

#### Division of Veterinary Medicine

Edward Raymond Frank
William Taylor Miller

#### Division of Engineering

Guy Emerson Buck
Claude Raymond Butcher
La Motte Grover
Carroll Mendenhall Leonard
Frank O. Miller
George Vernon Mueller
Robert Theodore Shideler
Ray Leonel Smith
Thelbert Leroy Weybrew
John Camp Wilkins

#### Division of Home Economics

Grace Marie Currin
Mildred Faye Emrick
Bernice May Flemming
Louise Morse
Jessie Adelaide Newcomb
Zoe O'Leary
Zella Kouns Smith

#### Division of General Science

Eunice Miriam Anderson
Dahy Basket Barnett
Verna Breese
Mary Penelope Burtis
Floyd Charles Butel
Marie Correll
Elizabeth Lida Curry
Leonora Katherine Doll
Milton Stover Eisenhower

# SENIOR HONORS

(1924)

## Division of Agriculture

*Walter Wisnicny
*Marvel Leon Baker
*Max Manley Hoover
Earl Milo Litwiller
Ralph William Sherman
Jack Wilbur Dunlap
Dan Matthew Braum
Fred Franklin Lampton
Raymond Luther Stover
Charles Orville Dirks

## Division of Veterinary Medicine

*Edward Raymond Frank
William Taylor Miller

## Division of Engineering

*La Motte Grover
*Thelbert Leroy Weybrew
*John Camp Wilkins
Robert Theodore Shideler
Robert Franklin Blanks
Guy Emerson Buck
George Vernon Mueller
Ralph Leonel Smith
Claude Raymond Butcher
Ira David Sankey Kelley

## Division of Home Economics

*Louise Morse
*Grace Marie Currin
Mildred Faye Emrick
Irene Antoinette Etzold
Zella Kouns Smith
Zoe O'Leary
Veneta Frances Goff
Bernice May Flemming

## Division of General Science

*Mary Penelope Burtis
*Marie Correll
*Verna Breese
Eunice Merian Anderson
Floyd Charles Butel
Milton Stover Eisenhower
Dahy Baskett Barnett
Eleanor Hannah Davis
Leonora Katherine Doll

# JUNIOR HONORS

## Division of Agriculture

Walter Jones Daly
Glen Ivan Wood
Alfred Harold Noyce
Glen McKinley Reed

## Division of Veterinary Medicine

Floyd Edgar Hull

## Division of Engineering

Wayne McKibben
Willis Ewart Garrett
George Addison Plank
Christian William Scheum
Harry Wilton Uhlrig
Fred John Sheel
Theodore McKinley Berry

## Division of Home Economics

Phyllis Winifred Burtis
Sarah Hilda Black
Stella Constance Munger
Evelyn Charlotte Colburn
Ruth Marion Kell

## Division of General Science

Roy Clinton Langford
Helen Grosvenor Norton
Helen Elizabeth Correll
Hilda Frost Dunlap
Alice Louise Paddleford
Lona Gertrude Hoag

* Awarded high honors.

## SOPHOMORE HONORS

### Division of Agriculture

Adolph George Jensen
Merritt Paul Brooks
Leon Holm
Robert Whitsel Fort

### Division of Veterinary Medicine

Wayne Santie O'Neal

### Division of Engineering

Ralph Louis Beach
Bennie Albert Rose
Raymond Johnson
George Joseph Fiedler
Calvin Steward Lyon

### Division of Home Economics

Mildred Bertha Thurow
Dorothy Genevieve Waters
Josephine Elizabeth Brooks
Alice Josephine Englund
Constance Emma Hoefer
Emma Katherine Scott
Gladys Viola Renfro

### Division of General Science

Anna Eleanor Nohlen
Jessie Ellen Bogue
Thelma O'Dell Carter
Albert Heslip Bachelor
Rida Floy Duckwall
Ralph Henry Eaton
Meriam Louise McGaw
Jessie Viola Bergin
Ruth Lora Houchuli
Mildred Vivian Reasoner
Elma Leon Hendrickson
Dorothy Louise Sanders
Geneva Fern Faley

# List of Students

## STUDENTS PURSUING GRADUATE WORK

### I. Graduate Students

†Margaret Ahlborn, A. B. 1906 (University of Kansas), *Food Economics and Nutrition*
Manhattan

†Harriet Wright Allard, B. S., 1923 (Kansas State Agricultural College), *Household Management*
Manhattan

†Harold Allen, B. S. in C. E. 1920 (University of Colorado), *Applied Mechanics*
Manhattan

†Bernard Martin Anderson, B. S. 1923 (Kansas State Agricultural College), *Animal Husbandry*
Manhattan

Gail Tatman Apitz, B. S. 1914 (Kansas State Agricultural College), *Household Economics*
Manhattan

†Cliff Errett Aubel, B. S. 1915 (Pennsylvania State College). M. S., 1917 (Kansas State Agricultural College), *Animal Husbandry*
Manhattan

†Madalyn Avery, B. S. 1924 (Kansas State Agricultural College), *Clothing and Textiles*
Wakefield

†Walter Buswell Balch, B. S. 1919 (Cornell University), *Horticulture*
Manhattan

†Edna Florence Bangs, B. S. 1923 (Kansas State Agricultural College), *Bacteriology*
Madison

†Floyd Wayne Bell, B. S. A. 1911 (Cornell University), *Animal Husbandry*
Manhattan

†Ada Grace Billings, B. S. 1916 (Kansas State Agricultural College), *History*
Manhattan

†Boyd Bertrand Brainard, B. S. in M. E. 1922 (University of Colorado), *Mechanical Engineering*
Manhattan

*Duke Daniel Brown, B. S. 1921 (Kansas State Agricultural College), *Soils*
Manhattan

†Harold William Brown, A. B. 1924 (Kalamazoo College), *Zoölogy*
Manhattan

†Esther Bruner, B. S. 1920, M. S. 1921 (Kansas State Agricultural College), *Chemistry*
Manhattan

†Harry Ray Bryson, B. S. 1917, M. S. 1924 (Kansas State Agricultural College), *Entomology*
Manhattan

†John Flower Bullard, D. V. M. 1922 (Cornell University), *Bacteriology*
Manhattan

†Osceola Hall Burr, B. S. 1923 (Kansas State Agricultural College), *Education*
Manhattan

†James Henry Burt, D. V. M. 1905 (Ohio State University), *Anatomy and Physiology*
Manhattan

†Dorothy Cashen, B. S. 1917 (Carthage College), M. S. 1920 (Kansas State Agricultural College), *Botany and Plant Pathology*
Manhattan

†Ernest Knight Chapin, A. B. 1918, M. S. 1923 (University of Michigan), *Physics*
Manhattan

†Elmer Philip Cheatum, A. B. 1924 (Southwestern College), *Zoölogy*
Langdon

†Florence Roberta Clarke, A. B. 1916 (University of Washington), *Clothing and Textiles*
Manhattan

†Frank Harold Collins, B. S. 1920 (Kansas State Agricultural College), *Chemistry*
Manhattan

†Commodore Foote Cool, A. B., B. O. 1897 (Kansas Normal College), *Shop Practice*
Manhattan

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* Under auspices of the U. S. Veterans' Bureau.

† Member of K. S. A. C. faculty.

†Nelson Antrim Crawford, B. A. 1910 (State University of Iowa), M. A. 1914 (University of Kansas), *Industrial Journalism and Printing*
Manhattan

†William Wesley Crawford, A. B. 1912 (State University of Iowa), B. A. in C. E. 1917 (Iowa State College), *Mechanical Engineering*
Manhattan

Pearl Artena Cross, B. S. 1915 (Kansas State Agricultural College), *Household Economics*
Wichita

†Bertha Lewis Danheim, B. S. 1920, M. S. 1923 (Kansas State Agricultural College), *Zoölogy*
Blue Rapids

†Allan Park Davidson, B. S. 1921 (Kansas State Agricultural College), *Education*
Manhattan

†Charles Deforest Davis, B. S. 1921 (Kansas State Agricultural College), *Agronomy*
Manhattan

Edgar William Davis, B. S. 1924 (Kansas State Agricultural College), *Entomology*
Lyons

†Earle Reed Dawley, B. S. in C. E. 1919 (University of Illinois), *Civil Engineering*
Manhattan

†Howard Robert De Rose, A. B. 1918 (University of Colorado), *Chemistry*
Manhattan

†Florence Lillian Dial, B. S. 1919 (Kansas State Agricultural Colloge), *English*
Manhattan

Susan Grace Dickman, B. S. 1918 (Kansas State Agricultural College), *English*
Fostoria

†Jean Swift Dobbs, B. S. 1923 (Northwestern University), *Household Economics*
Manhattan

Leonora Katherine Doll, B. S. 1924 (Kansas State Agricultural College), *Zoölogy*
Manhattan

†Rudolph Henry Driftmier, B. S. in A. E. 1920 (Iowa State College), *Agricultural Engineering*
Manhattan

Jack Wilbur Dunlap, B. S. 1924 (Kansas State Agricultural College), *Education*
Manhattan

†Merrill Augustus Durland, B. S. 1918 (Kansas State Agricultural College), *Machine Design*
Manhattan

†Eric Englund, B. S. 1918 (Oregon Agricultural College), A. B. 1919 (University of Oregon), M. S. 1920 (University of Wisconsin), *Agricultural Economics*
Manhattan

†Charles Ranger Enlow, B. S. 1920 (Kansas State Agricultural College), *Farm Crops*
Manhattan

†Morris Evans, B. S. 1920 (Kansas State Agricultural College), *Agricultural Economics*
Manhattan

Nellie Evans, A. B. 1914, B. S. 1917 (Oklahoma Agricultural and Mechanical College), *Institutional Management*
Manhattan

†Arthur Cecil Fay, B. S. 1920 (University of Missouri), M. S. 1921 (University of Wisconsin), *Bacteriology*
Manhattan

†George Albert Filinger, B. S. 1924 (Kansas State Agricultural College), *Horticulture*
Cuba

†James Burgess Fitch, B. S. 1910 (Purdue University), *Dairy Husbandry*
Manhattan

†Ray Flagg, B. S. in E. E. 1905 (Purdue University), *Mechanical Engineering*
Manhattan

†Beatty Hope Fleenor, B. S. 1919, M. S. 1923 (Kansas State Agricultural College), *Education*
Manhattan

Bernice May Flemming, B. S. 1924 (Kansas State Agricultural College), *Household Economics*
Manhattan

Nelle Dwyer Flinn, B. S. 1916 (Kansas State Agricultural College), *Household Economics*
Admire

†Martha Elizabeth Foster, A. B. 1924 (Southwestern College), *Zoölogy*
Leon

†Ralph Leonidas Foster, B. S. 1922 (Kansas State Agricultural College), *Industrial Journalism*
Manhattan

†Forrest Faye Frazier, C. E. 1910 (Ohio State University), *Civil Engineering*
Manhattan

†Martin Frederick Fritz, B. S. 1924 (Kansas State Agricultural College), *Education*
Manhattan

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† Member of K. S. A. C. faculty.

†Manford Furr, B. S. in C. E. 1913 (Purdue University), *Civil Engineering*
Manhattan

†Hazel Irene Gardner, B. S. 1923 (Kansas State Agricultural College), *Education*
Hutchinson

†Beatrice Gates, B. A. 1923 (State University of Iowa), *Household Economics*
Pierre, S. Dak.

†George Gemmell, B. S. 1920, M. S. 1922 (Kansas State Agricultural College), *Education*
Manhattan

†Laura Rosalind Gifford, *Household Management*
Manhattan

†Randolph Forney Gingrich, B. S. C. E. 1923 (University of Nebraska) *Civil Engineering*
Manhattan

†Roy Monroe Green, B. S. 1914 (University of Missouri), *Modern Languages*
Manhattan

Arthur Jerome Groesbeck, A. B. 1909 (University of Kansas), *Mechanical Engineering*
Manhattan

Floriano Fernando Guimaraes, B. S. A. 1922 (Escola de Agronomia e Veterinaria Petotos), *Agricultural Economics*
Rio Grande, Brazil

†Willard Bryant Hafford, B. S. M. E. 1920 (Ohio State University), M. S. 1924 (Purdue University), *Mechanical Engineering*
Manhattan

John Wendell Harnly, B. S. 1924 (McPherson College), *Chemistry*
Waukegan, Ill.

†Stella Maude Harriss, B. S. 1917, M. S. 1919 (Kansas State Agricultural College), *Chemistry*
Manhattan

†Lawrence William Hartel, A. B. 1911 (Central Wesleyan College), B. S. 1915 (University of Missouri), M. S. 1924 (Kansas State Agricultural College), *Physics*
Manhattan

†Nathan Daniel Harwood, D. V. M. 1918 (Kansas State Agricultural College), *Veterinary Medicine*
Manhattan

†Irwin Lloyd Hathaway, B. S. 1924 (Kansas State Agricultural College), *Bacteriology*
Manhattan

†Harold Hedges, B. S. 1921, A. M. 1924 (University of Nebraska), *Agricultural Economics*
Manhattan

†Chester Albern Herrick, B. S. 1921, M. S. 1923 (Kansas State Agricultural College), *Zoölogy*
Colony

Katharine Jane Hess, B. S. 1900 (Kansas State Agricultural College), *Clothing and Textiles*
Manhattan

†Grace Roberta Hesse, A. B. 1917 (University of Michigan), *English*
Manhattan

†Verne Hillman, B. S. in A. E. 1920 (Iowa State College), *Agricultural Engineering*
Manhattan

†Alene Therea Hinn, A. M. 1925 (Columbia University), *Architecture*
Manhattan

†William Russell Hinshaw, D. V. M. 1923 (Michigan Agricultural College), *Bacteriology*
Manhattan

†Julian Adair Hodges, B. S. A. 1917, M. S. 1923 (University of Kentucky), *Agricultural Economics*
Manhattan

†Ina Emma Holroyd, B. S. 1916 (Kansas State Teachers College, Emporia), *Mathematics*
Manhattan

†Max Manley Hoover, B. S. 1923 (Kansas State Agricultural College), *Agronomy*
Burlingame

Charles Bannus Hudson, B. S. 1924 (Kansas State Agricultural College), *Bacteriology*
Fort Scott

†Orville Don Hunt, B. S. E. E. 1923 (State College of Washington), *Electrical Engineering*
Manhattan

†Stanley Paul Hunt, B. S. 1919 (Kansas State Agricultural College), *Architecture*
Manhattan

†John Jerry Inskeep, B. S. A. 1921 (Purdue University), *Agricultural Economics*
Wellington

Hal Francis Irwin, B. S. 1924 (Kansas State Agricultural College), *Agricultural Economics*
Manhattan

† Member of K. S. A. C. faculty.

†William Charles Janes, B. S. 1919 (Northwestern University), A. M. 1922 (University of Nebraska), *Mathematics*
Manhattan

Edward John Jelden, D. V. M. 1922 (Kansas State Agricultural College), *General Science*
Whitewater

Elma Sage Jones, B. S. 1913 (Kansas State Agricultural College), *Household Economics*
Manhattan

†Glen Howe Joseph, B. S. 1922, M. S. 1923 (University of Illinois), *Chemistry*
Manhattan

†Edward Guerrant Kelly, B. S. 1903, M. S. 1904 (University of Kentucky), *Entomology*
Manhattan

†Russell Marion Kerchner, B. S. 1922 (University of Illinois), *Electrical Engineering*
Manhattan

†Charles Howard Kitselman, D. V. M. 1918 (University of Pennsylvania), *Pathology*
Manhattan

†Royce Gerald Kloeffler, B. S. in E. E. 1913 (University of Michigan), *Architecture*
Manhattan

†Arthur William Knott, B. S. A. 1918 (University of Wisconsin), *Dairy Husbandry*
Manhattan

†Martha Morrison Kramer, B. S. 1916 (University of Chicago), A. M. 1920, Ph. D. 1922 (Columbia University), *Food Economics and Nutrition*
Manhattan

†Benjamin William Lafene, B. S. 1923 (Michigan Agricultural College), *Bacteriology*
Manhattan

†Mendel Elmer Lash, B. A. 1920, M. S. 1922 (Ohio State University), *Chemistry*
Manhattan

†Edward Henry Leker, B. S. A. 1917 (University of Missouri), *Agronomy*
Leavenworth

†Clarence Flavius Lewis, A. B. 1913 (University of Denver), *Mathematics*
Manhattan

†Herbert Frederick Lienhardt, D. V. M. 1916 (University of Pennsylvania), *Pathology*
Manhattan

†Earl Milo Litwiller, B. S. 1924 (Kansas State Agricultural College), *Entomology*
Manhattan

†Eugene Sidney Lyons, B. S. 1921 (Kansas State Agricultural College), *Soils*
Manhattan

†Carrick Lin McColloch, B. S. A. 1924 (University of Kansas), *Animal Husbandry*
Manhattan

Neva Colville McDonnall, B. S. 1913 (Kansas State Agricultural College), *Food Economics and Nutrition*
Wichita

†William Max McLeod, D. V. M. 1917 (Iowa State College), *Anatomy*
Manhattan

George Edwin Manzer, B. S. 1918 (Kansas State Agricultural College), *Animal Husbandry*
Manhattan

†Lawson Francis Marcy, A. B. 1924 (Evanville College), *Chemistry*
Manhattan

Edith Alice Marsh, A. B. 1924 (Washburn College), *Dietetics*
Topeka

†Ethel Justin Marshall, B. S. 1910 (Kansas State Agricultural College), *Household Economics*
Manhattan

†Henry White Marston, B. S. A. 1919 (Delaware State College), M. S. 1922 (Kansas State Agricultural College), *Animal Husbandry*
Manhattan

†Charles Walton Matthews, B. S. 1918 (Kansas State Teachers College of Pittsburg), *Modern Languages*
Manhattan

Keith Walter Miller, B. S. 1923 (Kansas State Agricultural College), *Economics and Sociology*
Manhattan

†Pierre Alphonse Miller, B. S. 1924 (Oregon Agricultural College), *Botany and Plant Pathology*
Manhattan

Fred Weymouth Milner, B. S. 1915 (Kansas State Agricultural College), *Dairy Husbandry*
Salina

†John McKay Moore, B. S. A. 1923 (Ontario Agricultural College), *Poultry Husbandry*
Manhattan

Effie May Morrow, B. S. 1909 (Kansas State Agricultural College), *Education*
Waterville

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†Member of K. S. A. C. faculty.

†Reed Franklin Morse, B. A. 1921 (Cornell College), B. S. 1923 (Iowa State College), *Civil Engineering*
Manhattan

†Thirza Adaline Mossman, A. B. 1915 (University of Nebraska), M. A. 1922 (University of Chicago), *Mathematics*
Manhattan

George Vernon Mueller, B. S. 1924 (Kansas State Agricultural College), *Electrical Engineering*
Sawyer

†Jonothan Alexander Munro, B. S. A. 1922 (Ontario Agricultural College), *Entomology*
Manhattan

†Charles Nitcher, B. S. 1921 (Kansas State Agricultural College), *Agricultural Economics*
Manhattan

Fay Powell Nitcher, B. S. 1921 (Kansas State Agricultural College), *Clothing and Textiles*
Manhattan

†John Huntington Parker, B. S. 1913 (University of Minnesota), *Industrial Journalism*
Manhattan

†Floyd Pattison, B. S. 1912 (Kansas State Agricultural College), *Poultry Husbandry*
Manhattan

†Loyal Frederick Payne, B. S. 1912 (Oklahoma Agricultural and Mechanical College), *Zoölogy*
Manhattan

†Clinton Elliott Pearce, A. B. 1913 (Massachusetts Institute of Technology), *Mechanical Engineering*
Manhattan

†Arthur Frederick Peine, A. M. 1913 (University of Illinois), *Agricultural Economics*
Manhattan

Lester Boyd Pollom, B. S. 1913 (Kansas State Agricultural College), *Education*
Topeka

†Mary Elizabeth Polson, B. S 1916 (Kansas State Agricultural College), *Architecture*
Manhattan

†Carrie Isabel Potter, B. S. 1922 (Ottawa University), M. S. 1924 (State University of Iowa), *Animal Husbandry*
Manhattan

†Leslie Ray Putnam, B. S. 1910 (Cornell College), *Education*
Manhattan

Harry Elijah Ratcliffe, B. S. 1923 (Kansas State Agricultural College), *Agricultural Economics*
Gaylord

†Harry Ernest Reed, B. S. 1914 (University of Missouri), *Animal Husbandry*
Manhattan

†Kenneth Miller Renner, B. S. 1921 (Iowa State College), *Dairy Husbandry*
Manhattan

Henry Irving Richards, B. S. 1922 (Kansas State Agricultural College), *Agricultural Economics*
Howard

†William Hugh Riddell, B. S. A 1922 (University of British Columbia), *Animal Husbandry*
Manhattan

†Charles Elkins Rogers, B. A. 1914 (University of Oklahoma), *Industrial Journalism*
Manhattan

†Frank Pletcher Root, B. S. 1914, M. S. 1924 (Kansas State Agricultural College), *Mathematics*
Manhattan

†William Hobson Rowe, A. B. 1922 (University of Michigan), *Agricultural Economics*
Manhattan

†Frank Daniels Ruppert, B. S. 1923 (State College of Washington), *Agronomy*
Manhattan

†Lucile Osborn Rust, B. S. 1921 (Kansas State Teachers College of Pittsburg), *Household Economics*
Manhattan

†Paul Baldwin Sawin, B. S. 1924 (Cornell University), *Animal Husbandry*
Manhattan

†Chaunsey Elias Sawyer, D. V. M. 1914 (Kansas State Agricultural College), *Pathology*
Manhattan

†Henry William Schmitz, B. S. 1922 (Kansas State Agricultural College), *Horticulture*
Manhattan

Hazel Iola Schrack, A. B. 1924 (Nebraska State Teachers College), *Institutional Management*
Elm Creek, Nebraska

†Everett Morrill Schreck, B. S. 1923 (Kansas Wesleyan University), *Botany and Plant Pathology*
Manhattan

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†Member of K. S. A. C. faculty.

†Joseph Prestwich Scott, D. V. M. 1914 (Ohio State University), M. S. 1924 (Kansas State Agricultural College), *Pathology,*
Manhattan

†Gabe Alfred Sellers, B. S. 1917 (Kansas State Agricultural College), *Mechanical Engineering*
Manhattan

†Mary Margaret Shaw, A. B. 1918 (Fairmount College), *Food Economics and Nutrition*
Manhattan

Frank Howard Shirck, B. S. 1923 (Kansas State Agricultural College), *Entomology*
Waterville

Deal Six, B. S. 1922 (Kansas State Agricultural College), *Shop Practice*
Versailles, Ill.

†Georgiana Hope Smurthwaite, B. S. 1911 (Utah Agricultural College)
*Food Economics and Nutrition*
Manhattan

†Howard Harold Steup, B. S. 1919) Purdue University), *Poultry Husbandry*
Manhattan

†Elma Ruth Stewart, B. S. 1921 (Kansas State Agricultural College), *Household Economics*
Manhattan

†Ellis Adolph Stokdyk, B. S. 1920 (University of Wisconsin), M. S. 1924 (Kansas State Agricultural College), *Agricultural Economics*
Manhattan

†Robert Edward Summers, B. S. in M. E. 1924 (Oregon State Agricultural College)
*Mechanical Engineering*
Manhattan

†Jason Richard Swallen, B. A. 1924 (Ohio Wesleyan University), *Botany*
Manhattan

Lewis Walker Taylor, B. S. 1922 (University of Wisconsin), *Poultry Husbandry*
Manhattan

Ruby Thomas, B. S. 1923 (Kansas State Agricultural College), *Education*
Argonia

†Rolla William Titus, A. B. 1909 (Washburn College), A. M. 1914 (University of Kansas), *Chemistry*
Manhattan

Daniel Jacobus Van den Berg, B. S. 1924 (University of Illinois),
*Botany and Plant Pathology*
Transvaal, South Africa

†Lola Beatrice Vincent, B. S. 1924 (Kansas State Agricultural College), *Zoölogy*
Manhattan

†Roy Wilson Wampler, A. B. 1920 (McPherson College), *Chemistry*
Manhattan

Govind Wazalwer, B. A. 1922 (Government Agricultural College), *Agronomy*
Nagpur, India

†Arthur Weber, B. S. 1922 (Kansas State Agricultural College), *Animal Husbandry*
Manhattan

Florence Rilla Whipple, B. S. 1912 (Kansas State Agricultural College),
*Clothing and Textiles*
Manhattan

†Leon Vincent White, B. S. 1918 (Kansas State Agricultural College), *Civil Engineering*
Manhattan

†Ray Wick, B. S. 1910 (University of Kansas), *Landscape Architecture*
Manhattan

†Cyrus Vance Williams, A. M. 1910 (University of Nebraska), *Education*
Manhattan

†Louis Coleman Williams, B. S. 1922 (Kansas State Agricultural College), *Horticulture*
Manhattan

†Phillip Anton Willis, B. S. M. E 1922 (Montana State College), *Mechanical Engineering*
Manhattan

†John Peter Willman, B. S. 1924 (Pennsylvania State Agricultural College), *Animal Husbandry*
Manhattan

Karl Marx Wilson, B. S. 1924 (Kansas State Agricultural College), *Education*
Concordia

†Murray Addison Wilson, B. S. 1922 (Kansas State Agricultural College), *Civil Engineering*
Manhattan

†Ignatius Albert Wojtaszak, B. S. 1920 (University of Michigan), *Mechanical Engineering*
Manhattan

Homer Carlton Wood, B. S. 1920 (Kansas State Agricultural College), *Agronomy*
Manhattan

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† Member of K. S. A. C. faculty.

†Floyd Maxwell Wright, B. S. 1923 (South Dakota State College), *Dairy Husbandry*
Manhattan

Wilbur William Wright, B. S. 1917 (Kansas State Agricultural College), *Education*
Winfield

†James Walter Zahnley, B. S. 1918 (Kansas State Agricultural College), *Agronomy*
Manhattan

†Naomi Bertha Zimmerman, B. S. 1919, M. S. 1921 (University of Nebraska), *Zoölogy*
Manhattan

## II. Seniors Pursuing Graduate Work

*Fred Denman Allison, *Agriculture*
Hazelton

Theodore McKinley Berry, *Engineering*
Manhattan

Grace Elizabeth Bressler, *General Science*
Manhattan

Estaban Aquilar Cabacungan, *Engineering*
Mercedes, P. I.

*Aura Melvin Carkuff, *Agriculture*
Miltonvale

*Sherman Harold Carter, *Engineering*
LeRoy

Eugene Arthur Cleavinger, *Agriculture*
Lowemont

May Danheim, *Home Economics*
Blue Rapids

Dorothy Davies, *General Science*
Manhattan

Mary Sisson Dey, *Home Economics*
Wellington

Gertrude Fulton, *Home Economics*
Harper

*Harry Ludwig Gui, *Agriculture*
St. Louis, Mo.

*Jennie Horner, *Home Economics*
Grainfield

*Carl Grant Iles, *Agriculture*
Manhattan

Everett Harold Ingersoll, *General Science*
Overbrook

Roy Clinton Langford, *General Science*
Galena

*Smith Herman Lapsley, *Engineering*
Belleville

Willard Larson, *General Science*
Manhattan

Myrtle Agnes Lenau, *Home Economics*
Hobart, Okla.

John Clyde Lentz, *Engineering*
Holton

Archie Ricklefs Loyd, *Engineering*
Hiawatha

Betty McCoin, *General Science*
Wichita

George Montgomery, Jr., *Agriculture*
Sabetha

Stella Constance Munger, *Home Economics*
Manhattan

Margaret Alice Newcombe, *General Science*
Garnett

Onie Lindsey Norton, *Agriculture*
La Cygne

Glen Bradshaw Railsback, *Agriculture*
Langdon

Glenn McKinley Reed, *Agriculture*
Galesburg

Alexander Frederick Rehberg, *Engineering*
Niles

Cecil Reed Ryan, *General Science*
Gooding, Idaho

Christian William Schemm, *Engineering*
Wakeeney

Lester John Schmutz, *Agriculture*
Junction City

Jennetta Frildo Shields, *Home Economics*
Lost Springs

Katie Grace Smith, *Home Economics*
Kingsdown

Robert Burns Smith, *Agriculture*
Brilliant, N. Mex.

Lloyd Raymond Swin, *General Science*
Newton

Harry William Uhlrig, *Engineering*
St. Marys

Anna Jean Unruh, *Home Economics*
Pawnee Rock

Glenn Ivan Wood, *Agriculture*
Milan

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*Under auspices of the United States Veterans' Bureau.

† Member of K. S. A. C. faculty.

# 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; ArE, architectural engineering; CE, civil engineering; ChE, chemical engineering; EE, electrical engineering; FME, flour-mill engineering; GS, general science; HE, home economics; IC, industrial chemistry; IJ, industrial journalism; LA, landscape architecture; M, music; ME, mechanical engineering; PSM, public school music; RC, rural commerce; and VM, veterinary medicine.

## SENIORS

Emily Adams (IJ); Maplehill
Ralph Adams (RC); Norton
Waldo Emerson Aikins (Ag); Valley Falls
Gulalesuig Amarsing Ajwani (VM); Shikarpur, India
Alfred George Aldridge (CE); Topeka
Fred Russell Allerton (VM); Hamlin
Frances Myrtle Allison (M); Florence
†*Fred Denman Allison (Ag); Hazelton
Robert Louis Anderes (Ag); Kansas City, Mo.
Cora Christine Anderson (HE); Belleville
Mae Anderson (HE); Belleville
Jules Louis Arnandez (VM); Manhattan
Leah Ellen Arnold (HE); Manhattan
Ruth Bachelder (IJ); Fredonia
George Myron Baker (CE); Wichita
August Irwin Balzer (Ag); Inman
Nora Elizabeth Bare (HE); Protection
Florence Barnhisel (HE); Wichita
Marjorie Fern Barth (GS); Manhattan
Paul Baum Bascom (RC); Wichita
Capitola Belle Bassett (HE); Okmulgee, Okla.
William Neff Batdorf (IJ); Burlington
Ralph William Bell (EE); Kinsley
Howard Orville Bennett (EE); Wamego
Catherine Hope Bernheisel (HE); Hartford
Blanche Lorraine Berry (M); Jewell City
†Theodore McKinley Berry (EE); Manhattan
Aubrey Ellsworth Bilger (GS); Hunter
Sarah Hilda Black (HE); Lewis
Mary Elizabeth Boid (GS); Culbertson, Mont.
Emogene Bowen (HE); Manhattan
Carl William Bower (Ag); Manhattan
Kenneth Karl Bowman (EE); Manhattan
Maurice Bradley (CE); Winfield
†Grace Elizabeth Bressler (GS 1; Grad 2); Manhattan
Amelia Blanche Brooks (HE); Manhattan
Chester Leroy Browning (Ag); Kingsville, Mo.
M. Russell Buck (ME); Topeka
Kerney Richardson Bunker (ME); Kansas City, Mo.
Phyllis Winifred Burtis (HE); Manhattan
Lottie May Butts (GS); Manhattan
†Esteban Aquilar Cabacungan (EE 1; Grad. 2); Mercedes, P. I.
George Henry Callis (GS); Chase
Harold Callis (GS); Chase
Arden Griffith Campbell (GS); Wilsey
Jessie Campbell (HE); Attica
Lamar Perkins Caraway (VM); Manhattan
†*Aura Melvin Carkuff (Ag 1; Grad 2); Miltonvale
Herbert Harold Carnahan (Ag); Garrison
Doyle Henry Carter (Ag); Trenton, Mo.
John Carter, Jr. (Ag); Elkhart
†*Sherman Harold Carter (EE 1; Grad 2); Le Roy
Thelma O'Dell Carter (RC); Le Roy
Arnold Bernard Cash (EE); Manhattan
*Norris Doddsworth Cash (VM); Manhattan
Helen Edythe Cass (HE); Orion
Margaret Elma Chandley (GS); Kansas City
Kenneth Chappell (IJ); Manhattan
Nathan Goodman Chilcott (EE); Mankato
Louis Edward Childers (IJ); Wamego
Harold Lincoln Church (VM); Manhattan
Helen Thompson Clark (HE); Valley Center
Charles Warren Claybaugh (IJ); Pretty Prairie
†Eugene Arthur Cleavinger (Ag 1; Grad 2); Lowemont
Evelyn Charlotte Colburn (HE); Manhattan
Edgar Elwood Coleman (GS); Alma
Evelyn Marilda Colwell (HE); Manhattan
John Herbert Coolidge (Ag); Greensburg
Mary Ellen Cormany (GS); Tulsa, Okla.
Helen Elizabeth Correll (IJ); Manhattan
Gavin Merle Crawford (EE); Leon
Elmer Remington Crooks (Ag); Topeka
Miles Ellsworth Crouse (Ag); Harlan
Edward Cunningham (Ag); Manhattan
Ruby Curl (HE); Olsburg
Erma Evangeline Currin (RC); Manhattan
William Alsop Dalton (GS); St. George
Walter Jones Daly (Ag); Manhattan
†May Danheim (HE); Blue Rapids
Ethyl Adeline Danielson (HE); Concordia
†Dorothy Davies (GS); Manhattan
Grace Lavine Davison (HE); Michigan Valley
Virginia Deal (HE); Kansas City, Mo.
Helen Sarah Deely (HE); Norton
Orville Marshall Deibler (EE); Manhattan
Eleanor Elizabeth Dempsey (GS); Manhattan
Rowland Leeds Dennen (GS); Manhattan
†Mary Sisson Dey (HE); Wellington
*Gerald Roderick Dowd (VM); San Francisco, Cal.
Alberta Edelblute (GS); Manhattan
Alfred Douglas Edgar (AE); Manhattan
Harold Chester Elder (AE); Mankato
Blanche Elliott (HE); Caney
George Forbes Ellis (Ag); East Las Vegas, N. Mex.
Delbert Frederick Emery (GS); Parsons

* Under auspices of the U. S. Veterans' Bureau.
† Also pursuing graduate study.

SENIORS—*Continued*

Lyle Wayne Ernst (Ag); Manhattan
Clifford Wayne Eshbaugh (CE); Manhattan
Raymond Philip Farquhar (ME); Manhattan
Alice Fisher (IJ); Manhattan
Daisy Boswell Floyd (GS); Manhattan
Eugene Stevenson Floyd (RC); Salina
Harvey Dwight Franklin (ME); Horton
Ella Amy Franz (HE); Emporia
Neosho Louise Fredenburg (HE); Council Grove
Audrey Genevieve Freeman (GS); Junction City
Hilma Marie Freeman (GS); Courtland
John Charles Frey (Ag); Manhattan
Willis Frudden (ArE); Charles City, Iowa
†Gertrude Fulton (HE); Harper
Frances Opal Gaddie (GS); Bazaar
Margaret Ruth Gallemore (HE); Arkansas City
Willis Ewart Garrat (HE); Lawrence
Leo Emerson Garrison (CE); Lincolnville
John French Gartner (IJ); Manhattan
*Hugh Alexander Garvie (FME); Abilene
Lorena Esther Gathers (GS); Miltonvale
George William Givin (GS); Manhattan
Herbert Albert Goering (RC); Moundridge
Wallace Chester Goodell (RC); Independence
Arthur Ernest Goodwin (IJ); Concordia
Mary Lois Gorton (HE); Manhattan
*Joseph Emerson Greer (VM); Manhattan
†*Harry Ludwig Gui (Ag); St. Louis, Mo.
Frank Alexander Hagans (Ag); Manhattan
John Prentiss Hale (GS); Hill City
Florence Ina Haines (HE); Haven
Albert Alexander Haltom (Ag); Alden
Gertrude Claire Hamilton (HE); Wichita
Wilbur Henry Hanson (GS); Concordia
Marian Hardman (GS); Downs
Florence Harris (HE); Manhattan
William Gerald Harris (GS); Rose Hill
Bernard Cecil Harter (IJ); El Dorado
Richard Michael Hartigan (EE); Manhattan
Vera Doolittle Hedges (GS); Blue Mound
Walter Dedrick Hemker (AE); Great Bend
Alda Henning (HE); Burlington
Mabel May Herr (HE); Medicine Lodge
Mary Adelia Higinbotham (GS); Manhattan
Raymond Meridith Hill (EE); Burrton
Verne Clifford Hill (VM); Manhattan
Lona Gertrude Hoag (GS); Manhattan
Ruth Laura Hochuli (GS); Holton
Lois Holderbaum (HE); Kansas City
Clifford Andrew Hollis (RC); Fredonia
Chester Elmer Hommon (CE); Smith Center
James Wing Honeywell (GS); Manhattan
†*Jennie Horner (HE); Grainfield
George Christopher Horning (CE); Hunter
Frank Valburg Houska (CE); Washington
Ezra Edison Howard (CE); Garnett
Margaret Joye Howe (GS); Manhattan
Orrin Kem Howe (AE); Manhattan
Marjorie Hubner (PSM); Newton
Walter Henry Hukriede (Ag); Cleburne
*Floyd Edgar Hull (VM); Downs
Colbert Clinton Huntington (Ag); Eureka
Susie Katharon Huston (HE); Manhattan
Bertha May Hyde (GS); Altoona
†Carl Grant Iles (Ag); Manhattan
†*Everett Harold Ingersoll (GS); Overbrook
Charles Frank Irwin (CE); Le Roy
Bernice Georgia Issitt (GS); Navarre
Erna Vandella Johnsmeyer (HE); Manhattan
Conrad Hastings Johnson (EE); Latimer
Earl Gladstone Johnson (AE); Manhattan
John Arthur Johnson (CE); Manhattan
Milo Herbert Johnson (GS); Chanute
Robert Bruce Johnson (Ag); Salina
Walton Alfred Johnson (ME); Manhattan
Harry Ernest Jung (ME); Salina
Della Matilda Justice (HE); Olathe
Grace Josephine Justin (IJ); Manhattan
Herbert Lee Kammeyer (IJ); Manhattan
John Clower Keas (Ag); Chanute
Ruth Marian Kell (HE); Manhattan
Cecil Earl Kielborn (Ag); Cambridge
Ruth King (HE); Windom
Irvin Bernell Kirkwood (CE); Marysville
Forrest William Kitch (Ag); Nekoma
Winifred Ellen Knight (GS); Medicine Lodge
Ida Frances Koenig (HE); Kansas City, Mo.
Snoda Grace Krider (HE); Wellston, Okla.
Olympia Ethel Kubik (HE); Caldwell
†Roy Clinton Langford (GS); Manhattan
†*Smith Herman Lapsley (EE); Belleville
†Willard Larson (GS); Manhattan
Hallie Alice Laughlin (HE); La Crosse
Louis Lauritson (Ag); Kansas City
†Myrtle Agnes Lenau (HE); Hobart, Okla.
†*John Clyde Lentz (EE); Holton
James Michael Leonard (EE); Newton
George Gray LeVitt (RC); Wilson
Charles Alden Logan (AE); Eskridge
Carl Walter Londerholm (RC); Manhattan
Charles Elbert Long (RC); Hutchinson
E. R. Lord (RC); Hutchinson
†Archie Ricklefs Loyd (AE); Hiawatha
Harry Francis Lutz (RC); Sharon Springs
†Betty McCoin (GS); Wichita
Mabel McComb (HE); Wichita
Hazel Bea McConnell (HE); Russell
Randall Birdell McIlvain (EE); Smith Center
Wayne Edwin McKibben (EE); Wichita
Donald Craig McMillin (Ag); Manhattan
Mildred Cecelia Mast (GS); Goff
William Joseph Matthias (Ag); Perry
Rolla Daniel Mayden (CE); Manhattan
Earl Ernest Meils (GS); Conway Springs
Ernest Miller (ME); Coffeyville
Louis Cunningham Miller (GS); Norton
Julia Melvina Moehlman (GS); Manhattan
†George Montgomery, Jr. (Ag); Sabetha
Lena Josephine Moore (HE); Wakarusa
Rael Fisher Morris (CE); Oswego
Sarah Sylvania Morris (HE); Manhattan
Harry Forest Moxley (Ag); Osage City
Iva Manilla Mullen (HE); Labette
†Stella Constance Munger (HE); Manhattan
Lyle Smith Munn (RC); Colby
Vincent Werner Nass (EE); Atchison
*Francis Joseph Nettleton (CE); Lenora
†Margaret Alice Newcombe (GS); Garnett
Bernice Rae Noble (HE); Manhattan
Dorothy Esther Noble (HE); Wichita
Floyd Orlando Northrop (IJ); Lawton, Okla.
Helen Frances Northup (HE); Washington
Helen Grosvenor Norton (RC); Chanute
John Evans Norton (Ag); Grainfield
†Onie Lindsey Norton (Ag); La Cygne
Keith Parsons Nowell (EE); Reeds, Mo.
*Harold Alfred Noyce (Ag); Manhattan
*Wilmer Lee Oakes (ArE); Manhattan
*Floyd Robert Oliver (CE); Stillwater, Okla.
Arthur O'Toole (VM); Arnold
Alice Louise Paddleford (IJ); Cedarvale
Alice Patterson (HE); Manhattan
Irvin Leslie Peffley (CE); Manhattan
Wendell Woody Perham (RC); Iola
Elizabeth Perry (HE); Pleasanton
Clifford Waybright Phares (EE); Wakeeney
Helen Sarah Pickens (HE); Lake City
Myrna Elizabeth Pilley (HE); Kansas City, Mo.
George Addison Plank (EE); Kansas City, Mo.
*Armer Porter (VM); Manhattan

* Under auspices of the U. S. Veterans' Bureau.

† Also pursuing graduate study.

SENIORS—*Concluded*

Theodore Cuyler Potter (RC); Natoma
Mildred Elvira Pound (IJ); Glen Elder
Josephine Bowen Powers (HE); Junction City
Bruce Pratt (ME); Herington
Iru Paul Price (GS); Syracuse
Virgil Dale Proctor (RC); Norton
Cecil Ray Prose (RC); Macksville
Richard Lawrence Pycha (IC); Salina
Elizabeth Quail (HE); Topeka
Harry Charles Quantic (GS); Riley
†Glen Bradshaw Railsback (Ag); Langdon
William Rankin (CE); Manhattan
Maxine Ransom (IJ); Downs
Gladwin Adolph Read (Ag); Manhattan
†Glenn McKinley Reed (Ag); Galesburg
Hervey Omer Reed (CE); Manhattan
Virginia Louise Reeder (HE); Troy
†Alexander Fredrick Rehberg (EE); Niles
Lois Evelyn Richardson (HE); Manhattan
Arthur Howard Riley (VM); Manhattan
Alvin Verne Ritts (GS); Topeka
Glenn Alvin Rixon (Ag); Cimarron
Charles Wesley Roberts (IJ); Oskaloosa
Norman Losey Roberts, Jr. (Ar); Manhattan
John Imile Rogers (Ag); Manhattan
Herbert Arthur Rose (ME); Waldron
Inga Ann Ross (HE); Amarillo, Tex.
Perie Pitts Rumold (FME); Manhattan
Laura Faye Russell (PSM); Manhattan
Ralph William Russell (Ag); Jewell City
†Cecil Reed Ryan (GS); Gooding, Idaho
Gladys LeVille Sandford (GS); Kansas City
Alfred Raymond Sargent (Ag); Manhattan
James Fred Savage (VM); Wright
†Christian William Schemm (EE); Wakeeney
†Lester John Schmutz (Ag); Junction City
Raymond Louis Scholz (Ag); Frankfort
Herbert Henry Schwardt (GS); Manhattan
Ethel Scott (HE); Burlington
Robert Ewing Sears (Ag); Eureka
Elnora Wanamaker Seaton (GS); Manhattan
Ruby Lavisa Seward (HE); Leon
Muriel Shaver (IJ); Cedarvale
Fred John Sheel (ME); Earlton
Donald Angus Shields (RC); Burlington
†Jennetta Frildo Shields (HE); Lost Springs
Byron Elbridge Short (IJ); Fredonia
Myrna Maude Smale (GS); Manhattan
Dean Olin Smith (CE); Russell
Earl Smith (Ag); Pratt
Julia Smith (GS); Junction City
†Katie Grace Smith (HE); Kingsdown
Linus Burr Smith (Ar); Hutchinson
†Robert Burns Smith (Ag); Brilliant, N. Mex.
Samuel Lewis Smith (ME); Mount Hope
William Scott Speer (Ag); Olathe
Glenn Wesley Spring (GS); Manhattan
Grace Ann Steininger (HE); Clay Center
Theodore Rosevelt Still (IC); Tonganoxie
Sheldon Batcheldor Storer (EE); Osborne
Clark Oliver Stratford (CE); El Dorado
Fred David Strickler (Ag); Hutchinson
Homer Lewis Sumners (Ag); Manhattan
James Kenneth Swales (EE); Kansas City
Milan Burdette Swartz (IJ); Hiawatha
†Floyd Raymond Swim (IC); Newton
Harry Alcid Swim (EE); Severance
*Fred James Sykes (Ag); Brewster
Delos Clifton Taylor (CE); Harveyville
Samuel Isaac Thackrey (GS); Manhattan
Harold Hetherington Theiss (CE); Hutchinson
Esther Margaret Thomas (HE); Ogden
Laureda Thompson (HE); Manhattan
Melville Samuel Thompson (GS); Manhattan
Eva Timmons (HE); Riley
George Edward Truby (Ag); Anthony
Charles Turnipseed (CE); Arkansas City
†Harry William Uhlrig (ME); St. Marys
†Anna Jean Unruh (HE); Pawnee Rock
Ferdinand Voiland (RC); Topeka
Emil von Riesen (IJ); Marysville
*Isom Raymond Ward (EE); Manhattan
Eugene Albertice Waters (GS); Wellsville
Emory Newton Watkins (Ag); Manhattan
Raymond Howard Watson (ME); Kansas City, Mo.
Jewell Kimball Watt (Ag); Topeka.
Curtis Crenshaw Watts (GS); Winfield
George Wheeler (GS); Denver, Colo.
Lewis Rexford Williams (EE); Topeka
Hugh Willis (Ag); Eureka
Dorothy Jean Willits (GS); Topeka
Claude Leonard Wilson (ME); Ottawa
Jessie Helen Winder (HE); Covert
Clell Burns Wisecup (GS); Manhattan
*Walter Wisnicky (Ag); Green Bay, Wis.
†Glenn Ivan Wood (Ag); Milan
Jay Roy Wood (Ag); Manhattan
Oscar Griffith Woody (Ar); Lincoln.
Henry Amos Wright (AE); Welsh, La.
*Claude Newton Yaple (Ag); Rago
Elmer William Young (VM); Manhattan.
Amanda June Zirkle (GS); Berryton

## JUNIORS

Grant Ackerman (VM); Weller, Neb.
Neil Adams (Ag); Humboldt
Robert Paul Aikman (EE); Anness
Vera Ethel Alderman (HE); Arrington
John Franklin Allen (RC); Galena
Glyde Anderson (HE); Manhattan
Carol Esther Ankeny (M); Manhattan
Walter Henry Atzenweiler (Ag); Huron
Dustin Avery (IC); Wakefield
Margaret Avery (HE); Wakefield
Esther Mary Babcock (HE); Hiawatha
Albert Heslip Bachelor (RC); Belleville
Roy Bainer (AE); Manhattan
John William Ballard (CE); Almena
Howard David Banta (RC); Oberlin
Harlan Barnes (ME); Bartlesville, Okla.
Gerald Dunnell Barton (EE); Oxford
Vincent Edward Bates (Ag); Kansas City, Mo.
Laurence Edwin Baty (EE); Manhattan
Paul Everette Bays (EE); Arkansas City
Ralph Louis Beach (ME); Chanute
Rhein Benninghoven (ME); Strong
*Glen Dennice Beougher (Ag); Oakley
Paul Eugene Berger (RC); Salina
Junnis Berthelson (VM); Manhattan
Marjorie Elizabeth Bettes (IJ); Independence
Fred Goff Billings (Ar); Manhattan
Jessie Ellen Bogue (PSM); Junction City
Walter Henry Bohnenblust (RC); Riley
Roxie Marguerite Bolinger (HE); Washington
Hazel Bowers (HE); Great Bend
Leslie Bowman (ME); Lebo
Allen Ward Boyce (RC); Minneapolis
Eugene Loyal Brady (EE); Manhattan
Mary Elizabeth Brandly (HE); Manhattan
Paul Talbott Brantingham (ME); Toledo, Ohio

* Under auspices of the U. S. Veterans' Bureau.

† Also pursuing graduate study.

JUNIORS—*Continued*

Halworth Thomas Brazier (ME); Kansas City
Horace Austin Brockway (Ag); Olathe
Harold James Brodrick (Ag); Osborne
Josephine Elizabeth Brooks (HE); Manhattan
Merritt Paul Brooks (Ag); Columbus
Gerald George Brown (ME); Junction City
Harold Eugene Brown (RC); Longford
Lucile Marguerite Brown (PSM); Hutchinson
Frank Brownlee (GS); Stafford
Fred August Brunkau (EE); Ellinwood
Cula Myriel Buker (HE); Kansas City, Mo.
Louis Burlie (EE); Anthony
Ruth Elizabeth Burns (HE); White Cloud
Charles Earle Burt (GS); Haddam
Edgar Davis Bush (EE); Liberal
Archie William Butcher (RC); Solomon
Roy Raymond Cameron (Ag); St. George
Benjamin Augustine Campbell (Ag); Dension, Texas
Virginia Elizabeth Carney (HE); Manhattan
Mott Titus Carroll (CE); Wichita
Harold Benjamin Carter (EE); Vinita, Okla.
Philip Ray Carter (VM); Bradford
Harold Nelson Cary (Ag); Ogden
Stanley Caton (Ag); Manhattan
Alice Winifred Chaney (HE); Kansas City, Mo.
Edward Jost Chapman (CE); Leavenworth
Clarence Hart Chase (Ag); Junction City
Esther Olive Chase (HE); Protection
Mary Chilcott (HE); Manhattan
Ralph Bennett Chilcott (ME); Mankato
Vera Mabel Chubb (HE); Topeka
Charles Samuel Clapper (GS); Minneola
Jessie Julia Clary (GS); Manhattan
Orem Richard Clency (RC); Elkhart
Charles Robert Clothier (ME); Manhattan
Thelma Elizabeth Coffin (GS); Le Roy
Leila Belle Colwell (HE); Manhattan
Leslie Roy Combs (IJ); Manhattan
Ida Augusta Conrow (HE); Manhattan
Bernard John Conroy (Ag); Manhattan
Esther Margaret Cormany (HE); Tulsa, Okla.
Orin Keith Correll (GS); Manhattan
Jack Coulson (IC); Abilene
Hazel Imogene Craft (GS); Blue Rapids
Judith Briggs Craig (HE); Manhattan
Frances Harriet Cunningham (HE); Hazelton
Beth Suzanne Currie (GS); Manhattan
Russell Dwight Dade (RC); Hutchinson
Bruce Oliver Dallam (GS); Faucett, Mo.
Imogene Carolyn Daniels (HE); Caney
Harry Linsday Davidson (EE); Topeka
Jessie Hedden Davis (M); Manhattan
Ruth Louise Davison (HE); Kansas City, Mo.
Anna Mae Davy (HE); Manhattan
Earl Edgar Dawson (GS); Manhattan
Lloyd Alvin Deniston (RC); Manhattan
Miriam Lenore Dexter (IJ); Manhattan
Viola Lula Dicus (HE); Hutchinson
Charles Edward Dominy (Ag); Atwood
*David Neill Donaldson (Ag); Fort Collins, Colo.
*Herbert Ivan Durham (EE); Manhattan
Paul Maynard Durland (RC); Irving
Helen Elsie Eakin (GS); Manhattan
Ralph Henry Eaton (GS); Wilson
Homer Lee Edgell (CE); Leavenworth
Bertha Mattie Egger (HE); Ellis
Orin Ellis (GS); Phillipsburg
David Franklin Engle (VM); Abilene
Alice Josephine Englund (HE); Falun
Fred Page Eshbaugh (Ag); Manhattan
Harold Waldo Evans (CE); Manhattan
Lucile Marguerite Evans (M); Manhattan
Orrell Corrinne Ewbank (GS); Topeka
Geneva Fern Faley (GS); Manhattan
Tom Faris (AG); Manhattan
Clayton Farrar (GS); Abilene
Earl Vern Farrar (ME); Burlingame
Guy Hubert Faulconer (Ag); El Dorado
Laura Catherine Fayman (GS); Manhattan
Harry Felton (RC); Hays
George Joseph Fiedler (EE); Bushton
Delbert Alonzo Finney (RC); Topeka
Ronald Dale Finney (CE); Topeka
Jennie LaRue Fisk (GS); Manhattan
Ernest Lowell Florea (CE); Rosalia
Blanche Evans Forrester (IJ); Manhattan
Robert Whitsel Fort (Ag); St. John
Margaret Lansden Foster (IJ); Manhattan
Ralph Lloyd Foster (ME); Los Angeles, Cal.
Ben Wade Friedel (Ar); Fort Scott
Louis Edwin Fry (Ar); Bastrop, Tex.
Karleen Garloch (HE); Kansas City, Mo.
Forrest Garner (GS); Hiawatha
Lloyd Albert Gates (EE); Downs
Bessie Geffert (GS); Manhattan
Susie Charlotte Geiger (HE); Brookville
Bernice Irene Gilkerson (HE); Seneca
Josephine Gill (HE); Attica
Harold Luton Gillman (CE); Salina
Dorothy Edith Girton (HE); Minneapolis
Emmett Stanley Graham (RC); Manhattan
Lola Jane Graham (HE); Manhattan
Frank Perry Gross (Ar); Abilene
Harold Donovan Grothusen (CE); Ellsworth
*William Wallace Gunselman (Ag); Holton
Chester Walton Haas (GS); Larned
Ferdinand Daniel Haberkorn (RC); Hutchinson
Mary Elizabeth Haise (Ag); Manhattan
Helen Bertine Hale (GS); Kansas City, Mo.
Mary Olive Hall (IJ); New Albany
Jamal Hassan Hammad (Ag); Nablus, Palestine
Wesley Richmond Hansen (EE); Wichita
Floyd Vivian Hanson (ME); Assaria
Leonard Harden (Ag); Centralia
Clarence Leslie Harder (Ag); Minneapolis
George Thomas Harkins (CE); Ottawa
James Bruce Harris (EE); Kansas City
Jerry Milton Harris (Ag); Eudora
Lowell Newell Harter (GS); Herington
Nelle Alice Hartwig (GS); Goodland
Emma Kate Hassler (HE); Chapman
Glenn Cecil Hatfield (CE); Wichita
Louise Susan Hattery (HE); Manhattan
Everett Haukenberry (GS); Manhattan
Gerald Patterson Hays (EE); Ozark, Mo.
Lucile Beatrice Heath (M); Wakefield
Senn Hunter Heath (RC); Enterprise
Frank Paul Henderson (ChE); Anthony
Elma Leon Hendrickson (GS); Kansas City
Christie Cynthia Hepler (HE); Manhattan
Rachel Nancy Herley (GS); Topeka
Francis Floyd Herr (Ag); Medicine Lodge
Earl Howard Herrick (GS); Colony
Mary Jane Herthel (HE); Claflin
Theron Hicks (GS); Norton
Floyd Franklin Higbee (Ag); Manhattan
Earl Lomas Hinden (GS); Strong City
Foster Asher Hinshaw (EE); Lyons
Marshall Kitch Hoag (RC); Manhattan
Allen Hodshire (ME); Coffeyville
Constance Erma Hoefer (HE); Kaw City, Okla.
Carl Fred Hoelzel (Ar); Manhattan

* Under auspices of U. S. Veterans' Bureau.

JUNIORS—*Continued*

Austin Clair Hoffman (Ag); Abilene
Claude Gale Holden (Ag); Kansas City
Lionel Holm (Ag); Denmark
Vida Marie Holt (HE); Quinton, Okla.
Earl Robert Honeywell (Ag); Manhattan
*James Ralph Hoover (EE); Manhattan
William Nelson Hornish (CE); Pratt
Agnes Marie Horton (HE); Geuda Springs
Allen Gerald Hotchkiss (EE); Manhattan
Virgil Earl Hougland (EE); Beloit
Ralph Taft Howard (RC); Mount Hope
William Taylor Howard (ME); Garnett
William Lewis Howell (EE); Garnett
Howard Frederick Huber (LA); Leonardville
Irma Jean Huckstead (IJ); Junction City
Rex Ronald Huey (RC); Louisville
Dorothy Louise Hulett (HE);
Kansas City, Mo.
Adda Hunter (HE 1; GS 2); Eureka
Victor Carl Hurtig (VM); Delphos
Ozeta Alice Hutchison (HE); Canton
Vance Lavcic Hybskmann (EE); Corning
Fred Irwin (GS); Manhattan
Harry Isham (ChE); Coffeyville
Anna Alice Jacobs (GS); McCune
Mary Pinkerton Janes (GS); Olathe
Julia Aurelia Jennings (HE); Little River
Lula Ruth Jennings (HE); Greenwood, Mo.
*Adolph George Jensen (Ag); Manhattan
Achsa Johnson (HE); Aurora, Neb.
George Allan Johnson (CE); Simpson
Lillie Marie Johnson (HE); Walsburg
Ramond Julian Johnson (EE); Manhattan
*George Frederick Johnston (GS); Topeka
John Johnston (GS); Cedar
William Archie Johnston (CE); Concordia
Dwight Clovis Jones (IC); Turon
Esther Geneva Jones (HE); Keats
Eunice Ethel Jones (GS); Keats
Jesse Allen Jones (VM); Camden Point, Mo.
Zardus Jones (RC); Manhattan
Ralph Marion Karns (Ag); Ada
Garnet Elizabeth Kastner (HE); Manhattan
Frank Keller (ME); Humboldt
Marian Kendall (GS); Manhattan
Lily Kerns (HE); Hays
Nilie Charlotte Kneeland (GS); Liberal
Earl Martin Knepp (Ag); Frankfort
Frances Irene Knerr (GS); Manhattan
Ruby Bishop Knorp (GS); Hazelton
Kenneth Knouse (Ag); Valley Falls
Fritz Koch (RC); Burlington
Schuyler Franklin Kollar (Ag); Manhattan
Wilfred Jonathan Kraus (Ag); Hays
Leona Gertrude Krehbiel (GS); Moundridge
Charles Krone (VM); Delphos
Elmer Carl Kuhlman (EE); Pratt
Charles Glenn Kuykendall (RC); Manhattan
Venda Faith Laman (HE); Portis
Fremont Lange (VM); Carthage, Mo.
James Waggoner Lansing (RC); Chase
Ruth May Larsen (HE); Courtland
Ralph Gerald Larson (CE); Leonardville
Donald Earl Lathrop (Ag); La Harpe
Mary Isabel Laughbaum (HE);
Oklahoma City, Okla.
Julian Everett Lenau (ME); Hobart, Okla.
LaVange Lucile LeVitt (HE); Wilson
Ruth Agnes Limbocker (HE); Manhattan
Fred Wallace Lipps (CE); Abilene
Henry Lewis Lobenstein (Ag);
Bonner Springs
Ruth Engel Long (HE); Manhattan
Thomas Herman Long (EE); Wakeeney
Thomas Edward Lorson (RC); Chapman
Mary Euphrasia Lowe (HE); Manhattan
Ernest Lyness (Ag); Walnut
Calvin Stewart Lyon (EE); Faulkner
Etna Lyon (GS); Manhattan
James Roy McCague (EE); Wichita
Russell Emery McConkey (CE);
Lawton, Okla.
John McCoy (GS); Miltonvale
Harry Loyd McGee (EE); Ramona
George Raymon McGinn (EE); Winfield
Helen Bea McIver (HE); Abbyville
John David McKean (AE); Scott City
Ethel Iles McKeeman (HE); Manhattan
George John McKimens (EE);
Westmoreland
Florence McKinney (HE); Great Bend
Roberto Victor Macias (Ag);
Zacatecas, Mexico
Donald Elson MacQueen (IC); Salina
Lawrence Edward Maddox (EE); Hazelton
Harry Leroy Madsen (EE); Natoma
Miriam Louise Magaw (GS); Topeka
Robert Raymond Marshall (GS); Clifton
Paul Gordon Martin (CE); Manhattan
Fred Charles Mason (CE); Lincoln
Bernard Isaac Melia (Ag); Ford
Mildred LaVina Michener (M); Mulvane
Glenn Thomas Miller (GS); Winchester
John Miller (ME); Coffeyville
*Thomas Adolphus Mitchell (GS); Manhattan
Cornelius Henry Mobiley (VM);
Kansas City
Harry Allyson Moore (IJ); Manhattan
*Leo Albert Moore (GS); Manhattan
Mildred Moore (HE); Carthage, Mo.
Don Motter (RC); Wichita
Kenneth Berkley Mudge (EE); Salina
Cecil Madison Murphy (Ag); Talmage
Dorothy Joyce Myers (HE); Sylvia
Eleanor Ann Nelson (HE); Nettleton, Mo.
William Harold Newhard (RC); Peabody
Harry Dale Nichols (EE); Liberal
Mildred Mary Nickles (HE); Abilene
Clifford Oliver Nielson (CE); Independence
Philip Myron Noble (CE); Manhattan
Anna Eleanor Nohlen (GS); Cleburne
Edith Marie Norris (HE); Whitewater
Vernon Martin Norrish (EE); Manhattan
Alton Brooks Nuss (CE); Abilene
Loren Manuel Nuzman (GS); Manhattan
Einer Dow Nygren (EE); Manhattan
Max O'Brien (RC); Humboldt
Rex Okeson (ME 1; GS 2); Fairview
Letha Bernice Olson (HE); Oakley
Trena Matilda Olson (HE); Lincoln, Neb.
*Wayne Santee O'Neal (VM); Tarkio, Mo.
Esther Gladys Otto (HE); Riley
Lillian Frances Oyster (RC); Paola
Lowell Henry Paddock (AE) Lakin
Norman Edward Palmquist (Ar); Manhattan
Walter Parrott (VM); Atchison
Mabel Dora Patton (HE); Chase
Richard Donald Patton (Ag); Newton
Zurlinden Lafayette Pearson (GS);
Manhattan
Robert Perkins (RC); Oswego
Robert Harlan Perrill (Ag); Bridgeport
Margaret Frances Pickett (HE); Galena
Peter Piper (ME); Manhattan
Thomas George Pizinger (ME); Hoisington
Margaret Ploughe (IJ); Hutchinson
Genevieve Pogue (HE); Gallatin, Mo.
Harold Morgan Porter (EE); Topeka
William Shepard Price (EE); Topeka
Frank Oliver Randall (ME); Manhattan
Velma Estella Randall (HE); Manhattan

* Under auspices of the U. S. Veterans' Bureau.

JUNIORS—*Concluded*

Leverne Raynesford (EE); Salina
Victor Eugene Reef (ChE); Merriam
Mary Adele Rees (GS); Leoti
*George Ambrose Reid (RC); Manhattan
Harold George Rethmeyer (EE); Topeka
Harold Clifton Rhine (GS); Wamego
Mabel Rhine (IJ); Wamego
Wilda Aileen Rhodes (M); Manhattan
John William Richards (Ag); Madison
Lewis Jones Richards (GS); Manhattan
Ralph Ricklefs (Ag); Troy
Roy Lee Roberts (ME); Garden City
Charles Victor Robison (EE) Topeka
Elizabeth Sarah Rodewald (HE); Randolph
Harold William Roebke (Ag); Clifton
Arthur Lincoln Rogers (EE); Stratton, Colo.
Samuel Nicholas Rogers (AE); Manhattan
Harvey Wayne Rogler (Ag); Matfield Green
Helen Leone Rogler (HE); Matfield Green
Bennie Albert Rose (ME); Waldron
Dorothy Neleh Rosebrough (GS); Topeka
Annalou Turner Rucker (HE); Manhattan
Christian Elmer Rugh (EE); Topeka
Davida Jane Russell (IJ) Manhattan
Lawrence Oscar Russell (AE); Manhattan
Dorothy Sanders (M); Manhattan
Harold Davis Sappenfield (IJ); Abilene
William Merle Savage (EE); Durham
Goldie Inez Scarborough (HE); Watson, Mo.
Cornelia Margaretha Schaaf (PSM); Hope
Clarence Schmidt (CE); Wichita
Ella Louise Schrumpf (HE); Cottonwood Falls
Grace Dorothy Schultz (HE); Manhattan
Richard Schultz (EE); Wichita
Leo Schutte (EE); Wamego
Glen Owen Schwandt (EE); Manhattan
Emma Katherine Scott (HE); Kirwin
Irene Seiple (HE); Quinter
Lester William Servis (CE); Rock
Thelma Irene Sharp (HE); El Dorado
Jack William Sheetz (CE); Harveyville
Harold Maurice Shepard (RC); Hutchinson
Paul Arthur Shepherd (EE); Burlingame
Ralph Harley Sherman (Ar); Iola
Francis Marlin Sherwood (RC); Grenola
John Shirkey (Ag); Madison
Bahindar Singh (Ag); India
Clarence Slater (Ar); Arkansas City
Alice Geneva Smith (IJ); Agenda
Corinne Alice Smith (HE); Topeka
Mabel Rachel Smith (HE); Eskridge
Esther Olivia Snodgrass (HE); Talmage, Neb.
Charles Edward Snyder (Ag); Soldier
Sarah Elizabeth Southwick (HE); Hoisington
Dorothy Speer (GS); Wichita
Lloyd Ancil Spindler (GS); Garnett
Dorothy May Stahl (HE); Manhattan
Mildred Stahlman (HE); Potwin
John Roger Stebbins (ME); Ellis
Lydia Stebbins (HE); Kansas City
Arlo Stewart (Ag); Topeka
Ferol Avalon Stickel (HE); Manhattan
Dorothy Mildred Stiles (M); Kansas City
Edmund Lewis Stone (EE); Roswell, N. Mex.
Gladys Mirriam Stover (GS); Manhattan
Charles William Stratton (M); Manhattan
Clifford Harry Strom (EE); Junction City
Paul Loyd Stuenkel (CE); Lenora
William Fred Stuenkel (Ar); Lenora
Carl Eugene Sturdevant (ME); Chanute
Ruben Bernard Sundgren (GS); Sitka
Zaven Surmelian (Ag); Armenia
Charlotte Huntington Swanson (GS); Manhattan
Francis Howe Talbott (EE); Emporia
Clarence John Tangeman (RC); Newton
Carman Carl Tate (EE); Lockney, Tex.
Gordon Taylor (EE); Junction City
Ward Wesley Taylor, (Ag); Smith Center
Harley Albert Teall (EE); El Dorado
Eric Tebow (RC); Scandia
Gilbert King Terpening (Ag); Manhattan
Rebecca Louise Thacher (IJ); Waterville
Glen Edwin Thomas (CE); Topeka
Walter Iven Thomas (CE); Canton
Norris Ray Thomasson (EE); Independence
Helen Narissa Thompson (HE); Herington
George Marcus Thorpe (RC); Paola
Simon Jona Tombaugh (EE); Kansas City
Dean Willard Towner (EE); Solomon
Esther Irene Tracy (HE); Manhattan
Genevieve Thelma Tracy (IJ); Manhattan
Josephine Lee Trindle (GS); Hugoton
Erma Veta Tucker (HE); Gravette, Ark.
William Duncan Turner (GS); Lyndon
Harry Edwin Tuthill (EE); Salina
Ralph Leo Tweedy (GS); Iola
Edna Mae Unruh (PSM); Haddam
Manuel Valdez (CE); Santiago, Chile
Rollo Evans Venn (ME); Neodesha
George Arthur Venneberg (IJ); Havensville
Richard Louis von Trebra (Ag); Oswego
Alton Homer Walker (Ag); Kansas City, Mo.
Ida Jane Walker (GS); Manhattan
Gilmore Wann (RC); Hays
Louise Wann (GS); Hays
Earl Dawson Ward (ME); Elmdale
Vera Wasson (HE); Neosho, Mo.
Ethel Faye Watson (HE); Minneapolis
Virginia Elizabeth Watson (HE); Ash Grove, Mo.
Howard Gilbert Webber (RC); Dodge City
Aubrey Joseph Weber (EE); Manhattan
Norman Nathaniel Weberg (Ag); Salina
*Everett John Weeks (EE); Manhattan
Harry Richard Wege (EE); Great Bend
Glen Weidenbach (EE); Wichita
Lloyd Sherman Weikal (CE); El Dorado
Marie Weinheimer (HE); Ottawa
Florence Wells (IJ); Meriden
Wilma Emeline Wentz (HE); Ames
Ermine Mildred Werts (HE); Republic
Kathryn Whitten (HE); Wakarusa
Edward Warner Wichman (EE); Lawrence
Avis Wickham (HE); Manhattan
Francis Eugene Wiebrecht (EE); Strong City
Mary Edith Wilkins (GS); Lawrence
Mary Lois Williamson (HE); Independence, Mo.
Leo Kenneth Willis (EE); Galesburg
Earl Sanford Wilson (EE 1; GS 2); Jetmore
Harry Robert Wilson (M); Wichita
Corrinne Margaret Wiltrout (HE); Logan
Loyal Venice Wimer (EE); Le Roy
*Claude Winterscheid (EE); Gridley
Paul Raymond Wise (CE); Clearwater
Lorene Janice Wolfe (HE); Johnson
Lawrence Ewalt Woodman (EE); Manhattan
Bertha Gertrude Worster (IJ); Manhattan
Lillian Worster (HE); Manhattan
Franklin Neal Wray (CE); Manhattan
Esther Margaretta Wylie (HE); Quinter
Kenneth Elwood Yandell (RC); Wilson
David Yerkes (Ar); Hill City
Nora Yoder (GS); Newton

* Under auspices of the U. S. Veterans' Bureau.

## SOPHOMORES

Alice Abbott (PSM); Gretna
Ramon Alverez Acevedo (VM); Calivo, P. I.
George Acree (CE); Manhattan
Margaret Adams (GS); Long Island
Ray Adams (CE); Topeka
Marjorie Eloise Ainsworth (IJ); St. John
Kenneth Owen Alberti (EE); Kansas City
Curtis Carpenter Alexander (RC); Hutchinson
Henry Wright Allard (GS); Manhattan
George Max Allen (EE); Topeka
William Hurlbut Allen (EE); Rock Creek
Blanche Irene Allison (HE); Great Bend
Tyra Foley Alvis (EE); Yates Center
Earl Beverly Amos (EE 1; GS 2); Burlingame
Elizabeth Helen Anderson (PSM); Topeka
Fern Francis Anderson (IJ); Manhattan
Gladys Marie Anderson (HE); Neosho Falls
Hazel Lillian Anderson (HE); Bronson
Howard Melancthon Anderson (EE); Kansas City
Joseph McDaniel Anderson (GS); Salina
Paul Levere Anderson (CE); Soldier
Everett Harlan Andreson (CE); Abilene
Herbert Gregory Applebaugh (EE); Culver
Dorothea Pearl Arbuthnot (HE); Bennington
Orris Fair Armantrout (GS); Wichita
Frank Newell Atkin (EE); Manhattan
Irvin Milburn Atkins (Ag); Manhattan
Charles Beatty Ault (CE); Brownell
Irene Winifred Austin (IJ); Salina
Paul Axtell (Ag); Argonia
Harry Babbett (EE); Larned
Mattie Cecelia Babcock (HE); Hiawatha
Guy Norveil Baker (Ag); Syracuse
Mildred Mae Baker (GS); Syracuse
Stella Iva Baker (GS); Haviland
Esther Letha Bales (IJ); Manhattan
Carlton McCrary Barber (CE); Concordia
Irene Bridget Barner (HE); Wellington
Thomas Ralph Barner (CE); Belle Plaine
Mansel Barnes (RC); Protection
Lovell Barr (Ag); Manhattan
Lowell Barr (Ag); Manhattan
Janice Mary Barry (IJ); Manhattan
Harold Ralph Batchelor (EE); Manhattan
Helen Joy Batchelor (HE); Manhattan
Clarence Bayles (Ag); Garrison
Ignacio Becerra (Ag); San Nicolas, Argentina
Fred Beck (Ar); Inka
Alice Elizabeth Beeler (IJ); Jewell City
Marcia Alice Beggs (IJ); Washington
Paulam Anne Bellinger (GS); Manhattan
Jack Dale Bennett (RC); Concordia
Elsie Kathryn Bergstrom (PSM); Green
Loren Richard Berner (GS); Clifton
Christina Leola Bertsch (HE); Mayetta
Lawrence Best (AE); Pattonsburg, Mo.
Guy Cecil Bigelow (Ag); Potwin
Wilbur Herbert Binford (Ar); El Dorado
Robert Stuart Bishop (VM); Manhattan
Harris Franklin Blackburn (EE); Malta Bend, Mo.
Ralph Blackledge (IJ); Manhattan
Everett Lewis Blankenbeker (EE); Topeka
Merle Willard Bloom (AE); Liberal
Irma Marie Boettcher (HE); Holton
Clarence Edwin Bohnenblust (EE); Leonardville
Pearl Eugenia Boid (GS); Culbertson, Mont.
George Timothy Bond (CE); Topeka
Bessie Naomi Booth (IJ); Fairview
Lawrence Arthur Bosworth (ME 1; GS 2); Wichita
Richard Roscoe Bourne (RC); Delphos
Hilda Rees Bower (HE); Minneapolis
Dee Bowyer (EE); Potwin
Verne Wendell Boyd (RC); Irving
Lynn Harvey Bradford (IC); Topeka
Chris Ray Bradley (Ag); Mayetta
Edward Brainard (Ag); Canadian, Tex.
Lillie Pauline Brandly (IJ); Manhattan
Mildred Neilson Brantingham (HE); Concordia
Miriam Elizabeth Brenner (HE); Waterville
Christian Norman Bressler (RC); Manhattan
Clay Willard Brian (RC); Ada
Myrle Violet Broberg (IJ); Manhattan
John Thomas Brooks (GS); Columbus
Paul Orville Brooks (Ag); Horton
Hale Brown (EE); Onaga
Hale Brown (Ag); Edmond
Naomi Mabel Brown (HE); Junction City
Ralph Elmore Brown (CE); Salina
Aloysius Max Brumbaugh (RC); Home
Forest Brumm (RC); Manhattan
Robert Austin Buchanan (RC); Dwight
Howard Cornell Bugbee (GS); Manhattan
Herman Charles Bunte (EE); Hutchinson
Kenneth Allen Burge (IC); Fort Scott
Melvena Emma Burris (HE); Solomon
Sue Margaret Burris (HE); Chanute
Margaret Kirby Burtis (HE); Manhattan
Augustus Wells Burton (ME); Moran
James Edward Burton (Ar.); Hollis
Raymond Earl Burton (EE); Haddam
Clifton Andrew Byers (CE); Abilene
Orville Ray Caldwell (Ag); Emporia
Jesse Clair Campbell (EE); Wakeeney
Elmer Le Roy Canary (Ag); Lawrence
Carl Milton Carlson (Ag); Lindsborg
Earl Francis Carr (Ag); Byers
Lillian Iva Carver (PSM); Manhattan
Charles Loyd Cassel (GS); Long Island
George Kenneth Chew (RC); Manhattan
Ernest Iden Chilcott (Ag); Manhattan
Arthur Eugene Churchill (EE); Osage City
Thayer Cleaver (AE); Iola
Clyde Cless (Ar); Rossville
Owen Cochrane (IJ); Manhattan
Ernest Benjamin Coffman (Ag); Morrill
Paul Southworth Colby (EE); Abilene
George Collier (EE); Colwich
Mary Ellen Collins (HE); Wellsville
Morris Shellenbarger Coman (EE); Emporia
Earl Leighton Combest (GS); Ransom
Etta Marie Conroy (PSM); Manhattan
George Curtis Cooksey (IC); Manhattan
Josephine Bradford Copeland (HE); Salina
Rushton Gardner Cortelyou (CE); Manhattan
Lester Ellis Covert (CE); Topeka
John Henry Cox (RC); Assaria
Mary Louise Cox (HE); Downs
Max Edwin Crannell (Ag); Manhattan
Aletha Crawford (GS); Stafford
Ruth Cress (GS); Clements
Lena Lillian Crider (HE); Phillipsburg
Arthur Harry Croft (IJ); Anthony
Bert Andrew Crowder (ME); Topeka
Willis Harold Cuddy (RC); Manhattan
Ola Antoinette Curtis (HE); Lincoln
Lyle Cushing (CE); Downs
Eunice Ora Dalrymple (GS); Bennington
Eugene Dalrymple (GS); Simpson
Joseph Isaac Dalrymple (CE); Simpson
Hazel Flossie Dalton (RC); Kansas City
Fred Herbert Daniel (Ag); Kansas City, Mo.
Edgar Dannevik (EE); Troy
Keith Burnett Davidson (CE); Glasco
Carrie Elvard Davis (HE); Delavan
Daisy Davis (HE); Glen Elder
Helen Elizabeth Davis (HE); Kansas City
Howard Preston Davis (CE); Manhattan
James Frank Davis (GS); Kansas City
Loren Le Roy Davis (Ag); Effingham
Marion Bradford Davis (VM); Manhattan

SOPHOMORES—*Continued*

Raymond Howard Davis (Ag); Effingham
Claude Leroy Davison (Ag); Greensburg
Daisy Deane Davison (GS); Michigan Valley
Harold John Dayhoff (RC); Abilene
Edwin Debo (Ag 1; AE 2); Marshall, Okla.
Floyd Archie Decker (EE); Troy
David Deines (CE); Bazine
Clara Farmer Denison (GS); Hazelton
Harold Meade Denison (EE); Berryton
Glenn Scott Derby (EE); Axtell
Ira Gerhart Dettmer (CE 1; RC 2); Bushong
Margaret DeVinney (GS); Manhattan
John Dill (EE); Augusta
Helen Estelle Diller (HE); Morrowville
Herbert Dimmitt (EE); Manhattan
Bonnie Luella Dittmar (PSM); Manhattan
Leo Arthur Dixon (CE); Columbus
Esther Eulalia Dizmang (HE 1; PSM 2); Manhattan
Lowell Charles Domoney (EE); Downs
Arthur Doolen (Ag); Manhattan
Albert William Dooley (EE); Burns
Howard Earl Dorst (RC); Gardner
Mildred Kathryn Doyle (HE); Clay Center
Oswald Benton Dryden (IJ); Hoisington
Glen LeRoy Dunlap (VM); Lincoln, Neb.
Pansy Elmina Dunlap (HE); Berryton
Joseph Edgar Durham (GS); Manhattan
Glenn Albert Durland (RC); Irving
Doris Irene Dwelly (HE); Manhattan
John DeWitt Edwards (GS); Athol
Martin Arthur Edwards (EE); Manhattan
Mildred Clara Edwards (HE); Athol
Wallace Albert Eldred (RC); Lebanon
Betty Esther Elkins (HE); Wakefield
Opal Marion Endsley (PSM); Manhattan
Martha Vera Engle (HE); Abilene
Wilbur Gunter Enns (IC); LaPorte, Ind.
Duard Enock (FME); Abilene
Charles Leslie Erickson (IC); Fort Scott
Harry Emanuel Erickson (PSM); Manhattan
Darrel Lee Evans (M); Manhattan
Hobert Beals Evans (CE); Wellington
Hobart Leslie Evans (Ag); San Antonio, Tex.
James Glenn Evans (IC); Chanute
Orval Denton Evans (Ag); Lyons
Ralph Emerson Ewing (RC); Manhattan
Waldron DeWitt Fair (RC); Medicine Lodge
Herman Farley (VM); Manhattan
Alvin Farmer (ME); St. Joseph, Mo.
Lawrence Stewart Farrell (IC); Manhattan
Ruth Marie Faulconer (M); Manhattan
Elwin Elton Feather (RC); Assaria
Gerald Ferris (IJ); Chapman
Francis Aileene Fields (PSM); Manhattan
Marjorie Minnette Fleming (PSM); Manhattan
Olive Mae Flippo (HE); Abilene
Nels Philip Florell (GS); Jamestown
Vernon Daniel Foltz (GS); Belle Plaine
Stanley Malcolm Fraser (EE); Talmage
Paul Freeburg (GS); McPherson
Wilbert Garold Fritz (RC); Manhattan
Irma Rosetta Fulhage (GS); Yates Center
Hilliond Lafayette Gamble (EE); Halstead
Howard William Garbe (ME); Valley Falls
Joseph Homer Garrison (ChE); Lincolnville
Evelyn Alberta Garvin (PSM); Lawrence
Charles Gates (EE); Kingman
Ray Geddes (IC); Wellington
Harriet Geffert (RC); Manhattan
Esther Marie George (GS); Manhattan
Charles Raymond Gilbert (RC); Manhattan
Ralph Raymond Gillette (CE); Ottawa
Earl Todd Goodfellow (GS); Wells
Helen Elizabeth Graham (GS); Manhattan
Ruth Emma Graham (HE); Lovington, N. Mex.
Earl Francis Graves (VM); Manhattan
Clara Belle Gray (GS); Aurora
Helen Jeanette Greene (HE); Beverly
James Smith Griffes (GS); Manhattan
Martha Elizabeth Griffin (IJ); Girard
Emery Grove (CE); Bigelow
Claribel Florence Grover (GS); Iola
Welthalee Grover (HE); Iola
Lawrence Steanson Guthrie (AE); Saffordville
Theodore Fowler Guthrie, Jr. (Ag); Saffordville
Lydia Alma Haag (GS); Holton
James Michael Hacker (IJ); Manhattan
Joe Douglas Haines (RC); Manhattan
Kenneth Waldo Halbower (Ag); Anthony
Dorothy Hall (PSM); Sullivan, Ill.
Mamie LaClede Hall (HE); Augusta
Florence June Hanna (PSM); Clay Center
Sarah Elizabeth Hanna (PSM); Courtland
Leona Marie Hanson (HE); Randolph
Chester Llewellyn Harrington (ME); Parsons
Mabel Enola Harris (GS); Woodward, Okla.
Marian Brackett Harrison (HE); Jewell City
Acsa Margaret Hart (HE); Overbrook
Benjamin Franklin Hartman (EE); Salina
Virgil Hines Harwood (CE); Hutchinson
Chester Havley (GS); Frankfort
Gladys Iola Hawkins (HE); Tampa
Ferne Audrey Haymond (HE); Burdett
John Vance Hays (GS); Manhattan
Oscar Willard Hays (CE); Sylvia
Josephine Senn Heath (IJ); Enterprise
Robert Erwin Hedberg (RC); Kansas City
Adolph Helm (EE); Chanute
Ralph Louis Helmreich (ME); Kansas City
Mable Marie Henkell (IJ); Hiawatha
Mary Henry (PSM); St. Francis
Ralph Theron Herman (EE); Bazine
Stella May Heywood (HE); Bennington
Alfred Herman Hiesterman (Ar); Greenleaf
Harold Herbert Higginbottom (EE); Manhattan
George Lee Hill (RC); Gardner
Maurice Hill (RC); Manhattan
Emma Hilton (HE); Caney
Lora Valentine Hilyard (HE); Reece
Thomas Hinton (ChE); Kansas City
Erma Frances Hinz (GS); Abilene
Charles Frank Hirsch (RC); Ellinwood
Willard McIntire Hixon (EE); Berryton
Alma Louise Hochuli (GS); Holton
Russell Arthur Hoffman (RC); Cherryvale
Edith Josephine Holsinger (RC); Kansas City
William Milton Holt (CE); Augusta
Ruth Louise Holton (IJ); Manhattan
Frances Taylor Hooper (HE); Lincoln
Mabel Winifred Horlacher (HE); Colby
Mignon Corwin House (IJ); Manhattan
Raymond Edgar House (GS); Brookville
Dwight Hout (Ar); Formoso
Florence Inez Howard (GS); Burrton
Vera Frances Howard (HE); Mount Hope
Harold Hixson Howe (Ag); Wakeeney
Norman Hamilton Howell (VM); Kansas City
Ruth Geneva Hubbard (GS); Barnes
Guy Raymond Huey (RC); Louisville
Gilbert Lawrence Hug (GS); Scranton
Josephine Rose Hull (PSM); Manhattan
Helen Lois Humphrey (HE); Manhattan
Ernest Huscher (RC); Concordia
John Hyer (EE); Coffeyville
Marie Insley (HE); Junction City
Frances Catherine Iserman (HE); Topeka
Arthur Amos Jackson (Ag); Manhattan
Mary Clara Jackson (M); Manhattan
Elsie Mae Jarvis (HE); Kansas City
Maggie Lorene Jeffrey (HE); Elmdale
Mary Helen Jerard (PSM); Manhattan
Beryl LaVerne Johnson (HE); Olsburg
Carl Victor Johnson (EE); McPherson

SOPHOMORES—*Continued*

Glenn Irvin Johnson (AE); Greeley
Harvey Johnson (CE); Manhattan
Helen Lillian Johnson (HE); Manhattan
Henry William Johnson (EE); Leavenworth
John Harold Johnson (Ag); Norton
John Oscar Johnson (EE); Wakarusa
Mary Hannah Johnson (PSM); Alta Vista
Ruth Johnson (HE); Manhattan
Alice Johnston (HE); Irving
Eri John Joines (Ag); Clyde
Arnold Jones (RC); Haddam
Inez Jones (RC); Kansas City
Carrie Ida Justice (HE); Olathe
Lillian Kammeyer (IJ); Manhattan
Melvin Karns (EE); Bucklin
Mary Lee Keath (GS); Chillicothe, Mo.
Chester Keck (GS); Auburn
Leland Edward Keefer (CE); Salina
Frederick Leroy Kelley (RC); Quinter
Milton Joseph Kennedy (RC); Wichita
Virgil Oswald Kennedy (Ag); Winfield
Virgil Fletcher Kent (RC); Manhattan
Albert Harrison Kerns (EE); Manhattan
Dorothy Carlene Kiddoo (HE); Neodesha
Mary Marcene Kimball (IJ); Manhattan
Ruth Maurice Kimball (HE); Manhattan
Doris Kimport (HE); Norton
Ralph Emerson Kimport (Ag); Norton
Everett Kenneth Kindig (GS); Olathe
Benjamin King (GS); Nickerson
Kathryn Elizabeth King (GS); Manhattan
Glenn Albert Kirk (ME); Fort Scott
Stanley Jay Kirk (ME); Iola
Kenneth Walden Knechtel (Ag); Larned
Velma Tiera Krause (PSM); Logan
Walter Fred Kuiken (GS); Glen Elder
Archie Rhynaldo Kyle (EE); Ellsworth
Oswald Joseph Lacerte (EE); Collyer
Carlton Frederick Lalicker (RC); South Haven
*Paul Griffith Lamerson (Ag); McPherson
Harold Cecil Lantis (Ag); Newton
Oscar Dewey Lantz (Ar); Chapman
Bertha Harriet Lapham (M); Manhattan
Blanche Lapham (M); Manhattan
Florence Mildred Larmer (HE); Webber
Emil Larson (EE); Agenda
Agnes Mildred Lauchland (HE); Wichita
Howard Eugene Leach (Ar); Kansas City, Mo.
Mary Elizabeth Leaman (HE); Manhattan
Harlan Adelmer Lee (RC); Fort Scott
Mildred Inette Leech (PSM); Fredonia
Warren Shinkle Lemen (RC); Fontana
Louis Wirt Lemert (EE); Cedarvale
Laveda Florence Lilly (HE); Roxbury
Albert William Lindlar (EE); Manhattan
Emily Jean Loewen (HE); Hillsboro
Harold Verne Lucas (RC); Pratt
Clarence Ludeman (EE); Wichita
Forrest Nathan Luthey (CE); Carbondale
Walter Lutz (RC); Sharon Springs
James Theodore McBurney (ME); Manhattan
Ralph Waldo McBurney (Ag); Sterling
Wilma Irene McCord (HE); Manhattan
John Bush McCormick (AE); Oatville
Roy McCoy (EE); Kansas City
Winfield McCracken (CE); Manhattan
Francis William McDade (EE); Salina
James Julius McDonald (CE); Manhattan
Allan Edward McGrath (Ag); Paola
John Joseph McGrath (EE); Holton
John Duncan McGregor (Ag); Columbus
John Norris McIlnay (Ag); Omaha, Neb.
Ralph McKay (EE); Penalosa
Bernice Alice McKee (HE); Rexford
Ellis Buford McKnight (GS); Eskridge
Margaret McLean (HE); Salina
Earl Ira McMillan (AE); Miltonvale
Wilmer Johnston McMillin (Ag); Manhattan
Harold Matthew McNiff (EE); Manhattan
Paul Edmund McReynolds (ME); Plainville
Wilber Merlyn Mann (Ag); Quinter
Laurel Armstrong March (EE); Bucklin
Leslie Louis Marsh (Ar); Chanute
Charles Leroy Marshall (Ar); Atchison
George Edward Marshall (Ag); Bonner Springs
Lee Webster Marshall (Ag); Manhattan
Carlton Beeler Martin (Ag); Manhattan
Elmer August Martin (IJ); Stockton
Fred Edward Masek (EE); Norton
Robert Beaumont Mason (Ag); Kansas City
Meda Rea Masterson (HE); Riley
Lola Lorraine Matter (PSM); Manhattan
Dwight Lowry Maxwell (CE); Ottawa
Josephine June May (HE); Holton
Mildred Enola Mayden (HE); Manhattan
Lyle Mayfield (Ag); Alton
Francis Kendall Means (ChE); Everest
Daniel Verne Meiller (ME); Minneapolis
Jerome Jacob Meisenheimer (CE); Hiawatha
John Harry Merridith (GS); Kansas City
James Bailey Merryfield (FME); Salina
Victor Harold Meseke (CE); Manhattan
William Cleo Meseke (EE); Manhattan
Manie Herbert Meyer (EE); Mulvane
Mildred Dorothy Meyer (HE); Kansas City
Jean Frances Middleton (RC); Manhattan
Alice Elizabeth Miller (HE); Muscotah
Ansel Dwight Miller (EE); Belle Plaine
Elvas Miller (IJ); Manhattan
Harold Eugene Miller (CE); Lincoln
Lucille Eunice Miller (PSM); Logan
Phyllis Taevs Miller (HE); Meade
Silas Milbern Miller (GS); Meade
Theodore Harry Miller (EE); Kansas City
Wilbur Rupert Miller (GS); Lincoln
Elizabeth Mills (HE); Lake City
Horace Arthur Mills (VM); Ainsley, Neb.
Edwin Moburg (VM); Manhattan
Marjorie Lucille Moody (PSM); Riley
Chalmer Walter Moore (RC); Liberal
Hazel Lee Moore (HE); Protection
Herbert Arthur Moore (RC); Wichita
Robert McKenery Franklin Moore (AE); Wells
Claude Herbert Moreland (LA); Topeka
Archie Le Roy Morgan (EE); Emporia
Elmer Thomas Morgan (IJ); Wakefield
Herschel Oden Morris (RC); Mount Hope
Margaret Morris (PSM); Coffeyville
Velma Neeva Morris (PSM); Manhattan
Frank Brenner Morrison (GS); Manhattan
Major Floyd Mueller (AE); Sawyer
Harold Lewis Murphey (Ag); Protection
James Frederick Murphy (EE); El Dorado
Marie Sara Muxlow (GS); Manhattan
Harriet Helen Myers (Ag); Americus
Robert William Myers (ChE); Salina
Floyd Serene Naugle (EE); Highland
Donald Kenneth Nelson (EE); St. Joseph, Mo.
Merle May Nelson (HE); Jamestown
William Anthony Nelson (EE); Dwight
Alice Cecelia Nichols (IJ); Liberal
Karl William Niemann (Ag); Muskogee, Okla.
Loren Carlton Nordeen (RC); Dwight
Mary Norrish (HE); Manhattan
Will Nyhart (EE); Atchison

* Under auspices of the U. S. Veterans' Bureau.

SOPHOMORES—*Continued*

Bernice Ruth O'Brien (RC); Manhattan
Bernice O'Daniel (M); Westmoreland
Willis Frank O'Daniel (Ag); Westmoreland
Clarella Odell (HE); Manhattan
Merle Augustus Ogden (RC); Herington
Noel Olmstead (EE); Concordia
Archie John Pargett (Ag); Cawker City
Homer Leroy Parshall (RC); Manhattan
Agnes Patterson (HE); Manhattan
Ira Lloyd Patterson (Ar); Manhattan
Ruth Jeannetta Peck (HE); Beatrice, Neb.
Evelyn Stella Peffley (IJ); Manhattan
Mary Penner (HE); Potwin
Georgia Gwen Persons (GS); Manhattan
Charles Aaron Peterson (Ag); Caney
Edwin Peterson (GS); Marquette
Glenn Gordon Peterson (RC); Delavan
Vernon Stanley Peterson (ME); Gypsum
Loren Winfield Pew (IC); Greensburg
Austin Harold Pfeiffer (EE); Manhattan
Mary Kathryn Pfeiffer (GS); Manhattan
Bernice Josephine Phippenney (GS); Manhattan
Mary Frances Piatt (PSM); Hamilton
Elven Theodore Plowman (GS); Jewell City
Hazel Rebecca Popham (HE); Chillicothe, Mo.
Lucile Elizabeth Potter (IJ); Larned
Albert Wesley Pressgrove (Ag); Topeka
James Francis Price (RC); Manhattan
Claude Priest (CE); Towanda
Cecille May Protzman (GS); Rexford
Corintha Ruth Quinlan (HE); Linwood
Henry Patrick Quinn (IJ); Manhattan
Addie Alice Radebaugh (HE); Frankfort
Stephen Martin Raleigh (Ag); Clyde
Clyde Lamb Randall (GS); Kansas City
Jean Florence Rankin (PSM); Wakefield
Jeanie Green Rankin (RC); Manhattan
Joseph Earl Rankin (Ag); Mound City
Ezra Guy Rasmussen (RC); Cleburne
Harold Vernon Rathbun (EE); Manhattan
Lyle Cheadle Read (EE); Clay Center
Geraldine Buenta Reboul (GS); Phillipsburg
Kenneth Edward Rector (CE); Scott City
Mildred Marie Redd (HE); Norton
Myron Wesley Reed (GS); Norton
Selmar Arthur Reed (EE); Marysville.
William Benedict Reed (Ar); Glasco
Anna Dorothy Rehberg (HE); Bennington
Russell Reitz (Ag); Belle Plaine
Agnes Jeanette Remick (IJ); Manhattan
Chester Remsburg (ME); Iola
Frances Marie Richards (IJ); Manhattan
Lois Thomas Richards (ME); Manhattan
Madge Ricky (PSM); Norton
Viola Bell Ridge (HE); Iola
Veda Roach (IJ); Salina
James Truman Roberts (LA); Manhattan
Bella Catherine Robertson (HE); Manhattan
Esther Joanna Rodewald (HE); Randolph
Owen Rogers (EE); Bronson
Leonard Root (IJ); Independence
Richard Roper (EE); Manhattan
Frances Converse Rose (GS); Manhattan
Franklin Thomas Rose (GS); Rosedale
Eber Vernon Roush (GS); Lebanon
Kathryn Elizabeth Rumold (M); Manhattan
Ferne Russell (HE); Manhattan
Lorene Russell (HE); Manhattan
Mary Dillon Russell (M); Manhattan
Mildred Russell (GS); Fredonia
Harry Alfred Rust (Ag); Washington
Elwin Rutherford (EE); Manhattan
Russell Scott Sage (EE); Maplehill
Myron Loyd Sallee (GS); Long Island
Grace Samson (IJ); Topeka
Ellmore Franklin Sanders (VM); Erie
Waldron Gates Sanders (RC); Courtland
Aldene Scantlin (HE); Pratt
William Henry Schindler (Ag); Valley Falls
Oliver Delmar Schmidt (EE); Lorraine
Helen Schneider (IJ); Manhattan
Fred Schopp (Ag); Abilene
Ralph Schopp (GS); Abilene
Freda Amelia Schroeder (HE); Kiowa
Derald Henry Schultz (Ag); Miller
Ernest Othello Scott (CE); Elgin
Henry Charles Seekamp (Ag); Mulvane
Sheridan Settler (Ag); Council Grove
Frank William Shaw (EE); McPherson
Dorothy Sheetz (HE); Harveyville
Ralph Reel Shewmaker (CE); Chanute
Fred Merle Shidler (IJ); Girard
Waldo Richard Shuff (EE); Plevna
Beulah LeVerne Siddens (HE); Manhattan
Ernest Roosevelt Siefkin (EE); Wichita
Lonnie Joseph Simmons (Ag); Manhattan
Mildred Caroline Sims (GS); St. Joseph, Mo.
Veda Rozella Skillin (HE); Frankfort
Maurice Bailey Skinner (RC); Medicine Lodge
Lawrence Davis Slocombe (RC); Peabody
Bessie Henrietta Smith (HE); Frankfort
George Waite Smith (Ar); Hutchinson
Lorraine Elizabeth Smith (GS); Manhattan
Opal Ellen Smith (HE); Beloit
Raymond Edward Smith (GS); Manhattan
James Frederick Snyder (CE); Monrovia
Doris Amy Soper (HE); Manhattan
Elizabeth Katherine Sorenson (HE); Kansas City
Harold Mahlon Souders (Ar); Eureka
Paul Speer (ME); Olathe
Leonore Elizabeth Spence (RC); Randolph
Dorothy DeWolf Spindler (HE); Garnett
Clyde Leslie Spring (RC); Manhattan
Web Sproul (EE); Manhattan
Clarence Sprout (Ag); Mullenville
Jack Harvey Spurlock (VM); Burlingame
Firman Robert Staib (RC); Turon
Clinton Leonard Stalker (GS); Rossville
Lucile Bessie Stalker (PSM); Manhattan
Ross George Stapp (CE); Norcatur
Richard Blaine Stauffer (GS); Delphos
Dorothy Jean Stevenson (IJ); Oberlin
George Stewart (Ag); Morganville
Newton Stewart (CE); Vermillion
Ruth Stewart (PSM); Eureka
Maud Elizabeth Stitt (HE); Coats
Herbert Andrew Stocking (ME); Hiawatha
Glen Harold Stoffer (FME); Abilene
Joseph William Stout (GS); Emporia
Harold Earl Stover (EE); Colwich
Floyd Dewey Strong (GS); Manhattan
Carl Loren Studer (Ag); Manhattan
Edna Marie Suiter (RC); Macksville
Paul Swan, Jr. (EE); Washington
Joseph Gaines Swartz (EE); Atchison
Oliver Ellsworth Taintor (ME); Wichita
John William Taul (CE); Waynoka, Okla.
Gerald Leslie Taylor (EE); Marion
Jared Frederick Taylor (Ag); Wichita
Lee Thackrey (GS); Manhattan
Russell Ira Thackrey (IJ); Manhattan
Collins Walter Thole (Ag); Stafford
Ernest Raymond Thomas (Ar); Manhattan
Wesley Alexander Thompson (EE); Agenda
Arlie Irene Thresher (HE); Jetmore
Ralph Thurow (RC); Moscow
Jesse Harold Tindall (CE); Minneola
Milton Henry Toburen (GS); Cleburne
Ivan Keith Tompkins (Ag); Byers
Charles Horace Towle (RC); Wakefield
Mildred Edyth Troutfetter (PSM); Colby
John Willard Truax (ME); Peabody

SOPHOMORES—*Concluded*

Azel Oscar Turner (Ag); Valley Falls
Elizabeth Van Ness (PSM); Topeka
Pauline Alice Van Osdol (HE); Junction City
Leland Stanford Van Scoyoc (GS); Manhattan
Jack Vasey, Jr. (ME); Arkansas City
Van Victor Venables (Ag); Bellaire
Howard Victor Vernon (Ag); Oberlin
Belle Margaret Viers (HE); Manhattan
Helena Mary Viers (M); Manhattan
Forrest Barber Volkel (EE); Lenora
Crystal Louise Wagner (GS); Manhattan
John Corning Wagner (Ar); Manhattan
Oliver Walgren (VM); Denver, Colo.
Adelia Lavonne Walker (IJ); Manhattan
Diantha Walker (HE); Manhattan
Ralph DeForest Walker (EE); Junction City
Elsie Gertrude Wall (PSM); Cawker City
Cecil Albert Walt (EE); Gove
Elmer Oscar Wangerin (EE); Kensington
Edward Loyal Ward (ME); Ellinwood
Ralph Wareham (RC); Manhattan
Samuel Blake Wareham (RC); Manhattan
Arthur Wasson (EE); Peru
Albert Miles Watson (Ag); Osage City
Cloyce Herbert Watters (GS); Brookville
Harold Mansfield Weddle (CE); Lindsborg
David Martin Weisser (IJ); Paxico
Katherine Welker (HE); Coffeyville
James Ralph Wells (Ag); Manhattan
Leonice Pearl Wells (HE); Meriden
Robert Emmit Welsh (Ar); Manhattan
Ruth Violet Welsh (GS); Blackwell, Okla.
June Marguerite West (GS); Manhattan
Vesta Marguerite West (HE); Manhattan
Frank Loy Westerman (EE); Talmage
Earle Whitney Westgate (GS); Manhattan
Forest Livings Whan (RC); Manhattan
John Tanton Whetzel (Ag); Manhattan
Kathryn Marie White (HE); Oswego
Kerr Whitfield (CE); Ness City
George Wiedeman (ChE); Wichita
Hypatia Jeanne Wilcox (HE); Wichita
Alice Louise Williams (IJ); Conway Springs
*Archie Clay Williams (GS); Manhattan
Howard Charles Williams (EE); Cleburne
Paul Wesley Williams (RC); Olivet
Harold Arthur Williamson (GS); Manhattan
Earle Jennings Wilson (GS); Assaria
*Glen Wilson (EE); Neodesha
Otis Harold Wilson (GS); Jennings
Ruth Elizabeth Wilson (IJ); Goddard
Ruth Wise (HE); Clearwater
Halbert George Wishart (GS); Mankato
Marian Quisenberry Wolf (HE); Marion
Sebie Belle Wolfe (PSM); Johnson
Waldo Deen Wollam (CE); Protection
Duane Everett Wollner (EE); Nowata, Okla.
Roscoe Daniel Womer (RC); Manhattan
William Ray Woodring (EE); Manhattan
Genevieve Marguerite Woodruff (RC); Manhattan
*Harold Edwin Woolheater (IJ); Marion
Irvin Day Wright (ME); Stockton
Irwin Ira Wright (ME); Stockton
John Yost (EE); La Crosse
Gerald Martin Young (ME); El Dorado
Lawrence Warner Youngman (IJ); Harveyville
Richard Louis Youngman (IJ); Kansas City
Helen Alice Zeidler (GS); Manhattan
Dorothy Evelyn Zeller (HE); Manhattan
Emily Adeline Zerby (HE); Manhattan
Elsie Theresa Zohner (HE); Penokee

## FRESHMEN

Emily Maud Abel (HE); Silver Lake
Velma Ellen Abernathey (HE); Manhattan
Reinold Herman Abmeyer (Ag); Grantville
Forrest Adams (GS); Blue Rapids
Robert Frank Adams (EE); Wilsey
Harvey John Addams (RC); Blue Rapids
Ralph Emerson Ahlstrom (EE); Topeka
Ralph Edwin Ainsworth (EE); St. John
Dorothy Marguerite Akin (GS); Manhattan
Anna Elizabeth Allen (PSM); Galena
Charles Alfred Allen (GS); Maplehill
Guy Linza Allen (RC); Norton
William Jesse Allen (CE); Lebo
Lillian Dora Alley (HE); Oxford
Melvin Keith Allison (RC); Seneca
Arthur Fredric Alman (Ar); Salina
Vernon Carl Almquist (Ag); Great Bend
Wayne O'Daniel Amos (IJ); Manhattan
Eula May Celeste Anderson (HE); Scandia
Glen Thomas Anderson (RC); Iola
Gottfred Emanuel Anderson, Jr. (AG); Scott City
Helen Margeret Anderson (HE); Chanute
Paul Claude Anderson (GS); Alton
Robert Anderson (GS); Axtell
Rubie Alice Anderson (PSM); Axtell
Vinton Horace Anderson (EE); Joplin, Mo.
Harold Duane Arnold (GS); Manhattan
Noel Grant Artman (EE); Denison
Raymond Bayard Ashby (Ag); Stafford
Jessie Atkins (IJ); Manhattan
Edith Lillian Axcell (RC); Chanute
Milburne Clinton Axelton (Ag); Manhattan
John Henry Ayars (Ag); Keats
Edgar Dunard Backman (RC); Manhattan
Frances Backstrom (HE); Kansas City, Mo.
Lloyd Badesheim (RC); Seneca
Charlotte Leah Bailey (M); Topeka
Martha Ruth Bainer (PSM); Manhattan
Otis Bair (GS); Minneola
Ruth Eunyce Baker (GS); Syracuse
Roslyn Francis Bales (EE); Pratt
Marion Ellsworth Ballard (CE); Hazelton
Lewis Elbert Barber (GS 1; Ar 2); Augusta
Marion Crawford Barkley (GS); Manhattan
Mary Elvena Barkley (GS); Manhattan
Claude Lawrence Barnett (EE); Manhattan
Jesse Glenn Barnhart (ME); Independence
John Frazer Barr (RC); Manhattan
Robert Anderson Barr (RC); Manhattan
Hannah Helena Barre (HE); Tampa
Thelma Lorraine Barrick (HE); Parsons
Leon Bartholomew (RC); Mulvane
Orville Oscar Barton (GS); Junction City
Bert Bass (GS); El Dorado
Carl Bauer (EE); Highland
Arthur Ralph Bauerfind (GS); Minneapolis
John Alton Bayless (IJ); Lebo
Kay Haines Beach (Ag); Kansas City, Mo.
Verna Beardmore (PSM); Glasco
Clarence Elmer Beaty (RC); Linn
Edward Major Becton (Ag); Palmyra, N. J.
Alice Hannah Beil (HE); Bavaria
Phyllis Aileen Belknap (IJ); Abilene
Ruth Leanora Bell (HE); Lebanon
Scott Roe Bellamy (Ag); Meade
Margaret Thelma Benfield (GS); Waterville
Margaret Mary Beninga (HE); Riley
Erwin John Benne (GS); Washington
Lawrence Charles Benne (EE); Washington
Helen Bennett (PSM); Lenora
Maurice Orley Bennett (EE); Webster
Ruth Carolyn Bennett (PSM); Manhattan
Arthur Wallace Benson (Ag); Clay Center
Wilmer Gordon Beougher (RC); Oakley
Dorothy Myrle Bergsten (GS); Randolph

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FRESHMEN—*Continued*

Cora Cynthia Bernstorff (HE); Chase
John Carpenter Bertsch (Ag); Mayetta
Rosa Catherine Best (GS); Manhattan
Mary Leola Beyer (GS); Arrington
Theodore Albert Bickel (CE); Kansas City
James William Bickle (EE); Gypsum
Walter Bell Bigelow (CE); Buffalo
Gladys Audrey Bilger (HE); Hunter
Ralph Bilson (Ag); Eureka
Julia Biltz (HE); Manhattan
Loyle William Bishop (ME); Manhattan
Raleigh Marion Bishop (ME); Manhattan
Elsie Madge Bitler (HE); Eureka
Bernice Black (HE); Lawrence
Leslie Black (GS); Sterling
Philip Carl Blackburn (IC); Herington
William Earl Blackburn (EE);
Malta Bend, Mo.
James Lyle Blackledge (Ag); Sheridan, Wyo.
Hazel Nadine Blair (GS); Manhattan
Lee Ella Blake (GS); Kansas City
Stella Faye Blanks (IJ); Soldier
James Russell Blanton (CE); Shawnee
Hobart Patterson Blasdel (Ag); Sylvia
Floyd Albert Blauer (Ag); Stockton
David William Bletscher (GS); Leonardville
Walter Edwin Block (GS); Beverly
William Kenneth Bloomberg (RC); Cleburne
Weston Blunt (RC); Charles City, Iowa.
Kenneth Ralph Boardman (GS); Bennington
Alfrada Frances Bock (GS); Dillwyn
Henry Bock (IC); Cawker City
Louis Hamilton Bock (GS); Pratt
Helen Edith Boehm (HE); Stanley
Trobby Boles (IC); Enid, Okla.
Marie Mercedes Boller (PSM); Manhattan
Waldo LeRoy Bone (CE); Longton
Edgar Ewell Boone (EE); Kansas City
Mary Adda Boone (PSM); Manhattan
Winfred Halson Boorn (FME); Anthony
Gilbert Richard Borgman (EE); Enterprise
Carl Botsford (FME); Salina
Kate Marie Bowen (HE); Chillicothe, Mo.
Leo Charles Bower (RC); Goodland
Fannie Fern Bowman (GS); Harper
Ruth Linnette Bowman (HE); Manhattan
Evelyn Frances Boyce (GS); Minneapolis
Kenneth Arthur Boyd (GS); Irving
Ivan LeRoy Bozarth (Ar); Lenora
Blanche Brabec (GS); Narka
Richard Donald Bradley (EE); Dover
Carroll Parker Brady (EE); Manhattan
Raytie Louise Brake (IJ); Wichita
Edward Clement Bramlage (ChE);
Junction City
Carrie Brandejsky (GS); Severy
Rufus Milton Brawner (EE); Converse, Mo.
John Eberth Brink (Ar); Piper
Beulah Lorene Brinker (PSM); Goodland
Lola Gladys Brinker (PSM); Goodland
Gilbert Fred Brinkman (RC); Stafford
Earle Lloyd Brock (IJ); Jennings
Frank Brokesh (Ag); Munden
Harry Carter Brookhart (ME);; Columbus
Mary Shelton Brookover (GS); Eureka
Dorothy Brooks (HE); Manhattan
Maurice Vincent Brooks (GS); Beloit
Bruce Keach Brown (EE); Delphos
Crea Gene Brown (GS); Greensburg
Frank Benson Brown (Ag); Manhattan
Howard Donald Brown (M); Manhattan
Lena Evangeline Brown (HE); Manhattan
Rilda Maxine Brown (M); Manhattan
Rowena Luella Brown (IJ); Alta Vista
Gordon Brown (IJ); Topeka
Thelma Florence Brown (M); Manhattan
William Arthur Browne (VM); Burdett
Eva Anna Brownlee (HE); Zenith
Leonard Hathaway Brubaker (Ag 1; GS 2);
Manhattan
James Christy Bruce (CE); Junction City
Robert Ambrose Brunson (VM); Corona, Cal.
Doris Isabelle Bryan (HE); Greensburg
Lillian Josephine Brychta (HE); Blue Rapids
Nellie Matilda Burk (M); Courtland
Merel Melvin Burkholder (EE); Burr Oak
Daryl Burson (HE); Manhattan
Maurine Burson (GS); Manhattan
Sterling DeVere Burwell (CE); Liberal
Clair Butler (ChE 1; VM 2); Glasco
Ward Walter Butler (Ar); Glasco
Vail Howard Butterfield (EE); Manhattan
Winnivere Grace Button (HE); Topeka
Rubye Ethelyn Byrd (GS); El Dorado
Arthur Victor Cain (EE); Chanute
Verna Roselle Calkins (HE); Cortez, Colo.
George Dale Call (EE); Moline
Frank Howard Callahan (VM); Abilene
Alex Byron Campbell (RC); Marysville
Lewis Marvin Campbell (EE); Kirwin
Oren Emery Campbell (Ag); Cimarron
Edith Caraway (M); Shreveport, La.
Edith Anna Carnahan (GS); Garrison
Henry Carothers (Ag); Topeka
Floyd Eugene Carroll (VM);
Fredericktown, Mo.
William Edward Carroll (RC); Coffeyville
Lloyd Edward Carson (EE); Clifton
Maurice Marcellus Casey (Ag); Dorrance
George Harry Cash (CE); Independence
George John Caspar, Jr. (Ag); Alida
Grace Caswell (HE); Republican City, Neb.
Edward Chalk (CE); Frankfort
Cecil Chance (EE); Inka
Aileon Buhrer Chandler (HE); Enterprise
Paul Eugene Chandler (Ar 1; IJ 2);
Cottonwood Falls
Paul Eugene Chappell (EE); Manhattan
Herbert Chase (RC); Enterprise
Leda Irene Chayer (HE); Clay Center
Harold Lee Chilcott (ME); Mankato
Freda Couzetta Childress (HE); Galena
Helen Chrislip (HE); Hutchinson
Joseph Huston Church (CE); Austin, Minn.
Edna Ellen Circle (HE); Kiowa
Avice Belvah Clanin (HE); Jewell City
Paul Fredrick Clark (ME); Kansas City, Mo.
Ralph Oscar Clark (RC); Junction City
Winifred Clark (GS); Republic
Mary Louise Clarke (IJ); Paola
Lawrence Mervin Clausen (Ag); Alton
Vera Irene Clothier (HE); St. Marys
Helen Marie Clydesdale (HE); Gaylord
Roscoe Coberly (Ag); Gove
Donald Fairchild Coburn (GS); Kansas City
Clarence Lyle Coe (RC); Wichita
Melvin Cooper Coffman (EE); Wakefield
Kenneth Devore Cole (EE); Wetmore
Paul Buchanan Cole (RC); Abilene
Erma Mildred Coleman (GS); Mayetta
Ernest Coleman (CE); Topeka
Marion Alonzo Coleman (GS); Centralia
Edith Luella Collins (RC); Belleville
Neil Wright Collins (IJ); Washington
Floy Alpha Coltharp (GS); Leonardville
Guy Hess Condit (ChE); Pratt
John Paine Cone (AE); Rozel
Atlas Conley (EE); Manhattan
Charles Michael Conley (EE); Seibert, Colo.
William Sherman Conner, Jr. (EE); Clayton
Nelle Isabelle Conroy (PSM); Manhattan
Charles Edward Converse (GS); Manhattan
Mina Neola Conwell (M); Manhattan
Albert Edwin Cook (GS); Haddam
Bessie Cook (HE); Bucklin
Kenneth Harold Cook (EE);
Independence, Mo.
Ida Corinne Cool (PSM); Manhattan
Paul Cooley (Ar); Neodesha

FRESHMEN—*Continued*

Russel Sage Cooper (EE); Mankato
Harold Richard Corle (CE); Caney
Anna Grace Cornelssen (HE); Bazine
Ruth Correll (GS); Manhattan
Louis Alfredo Cortes (Ar); Bogota, Colombia
John Francis Costello (RC); Junction City
Claire Evangeline Cox (HE); Elsmore
Mary Josephine Cox (HE); Manhattan
Robert Eastman Cox (EE); Kinsley
Herman Alexander Cramer (EE); Macksville
Edward Crawford (Ag); Stafford
Goldie Mildred Crawford (HE); Leon
Joseph Earl Cress (EE); Manhattan
Clarence Crews (Ag); Elk Falls
Velma Virginia Criner (HE); Wamego
Roberta Gladys Cromwell (HE); Topeka
Earl Franklin Cross (FME); Wichita
Newton Cross (IJ); Manhattan
Walter McConnell Crossen (Ag); Turner
Robert Marshall Crouse (GS 1; ChE 2); Beattie
Allen Baxter Crow (GS); Harper
Mary Louise Crowder (HE); Manhattan
Catherine Crowley (HE); Manhattan
John Frank Crum (EE); Junction City
Gladys Hattie Crumbaker (PSM); Manhattan
Albert Matthew Cunningham (GS); Manhattan
Fern Elaine Cunningham (M); Junction City
Mary Elizabeth Helen Cunningham (HE); Manhattan
Raymond Samuel Currey (Ag); North Topeka
Eula Mae Currie (IJ); Manhattan
Charles Raymond Curtis (GS 1; Ag 2); St. John
Geraldeane Jeanette Cutler (GS); Manhattan
Edwin James Cutshaw (GS); Phillipsburg
Elmer LaSelle Cyphers (GS); Harper
Margaret May Dacy (HE); Kiowa
June Marguerite Daily (PSM); Ashland
Eldon Lyle Dale (GS); Manhattan
Percy Lee Dale (EE); Coldwater
Forrest Everett Dallas (RC); Harveyville
Elinor Marian Dalton (GS); St. George
Allen Elmore Davidson (ChE); Kansas City, Mo.
Francis Davidson (RC); Manhattan
George Jackson Davidson (Ar); Kansas City, Mo.
Gordon Davies (IJ); Manhattan
Loyal Hendrickson Davies (GS); Manhattan
Ruth Davies (GS); Manhattan
Elmer Davis (RC); Glen Elder
Frank Marshall Davis (IJ); Arkansas City
Leslie Sylvester Davis (EE); Delavan
Lester Eugene Davis (GS); Manhattan
Marion Davis (CE); Solomon
Paul Alvin Davis (ChE); Manhattan
Rex Kraus Davis (EE); Madison
Roy Edward Davis (EE); Morrill
Catherine Elizabeth Dawdy (GS); Jewell City
John Travis Dawe (RC); Hiawatha
Edward Glen Dawson (Ag); Manhattan
Kendall Walter Day (CE); Holton
Charles Dean (GS); Manhattan
Clara Frances Dean (PSM); Agra
George Everet Dean (RC); Blue Rapids
Helen Elizabeth Dean (HE); Manhattan
Howard Archie Dean (Ar); Edgerton
Lyle Daily DeBusk (RC); Macksville
Frank David Delp (ME); Iola
Willie Calvin Denton (EE); Denton
Evelyn DeRigne (HE); Kansas City
Robert Franklin Dice (EE); Wichita
Charles Ross Dickens (Ag); Manhattan
William Dickens (IJ); Manhattan
Marion George Dickson (CE); Manhattan
Robert Leland Dickinson (EE); Hays
George Byron Dicus (RC); Hutchinson
Clarence Byron Diefendorf (EE); Fairmont
Frederick Niles Dillman (Ar); Independence
Lawrence Masters Dilts (CE); Kaw City, Okla.
Paul Lawrence Dittemore (GS); Manhattan
Oscar Kirk Dizmang (Ag); Manhattan
Janet Doctor (PSM); Manhattan
Marion Milford Donoho (RC); Kansas City
Pauline Dooley (PSM); Burns
Dave Dorr (CE); Osage City
Robert Ellis Dorr (CE); Osage City
Dale Everet Dorst (EE); Gardner
George Norton Doudna (Ag); Manhattan
James McNair Douglass (RC); Burlington
Myles Delwin Dovel (Ag); Delphos
Wilkins Edgar Downing (GS); Pratt
Henrietta Drake (HE); Huron, S. Dak.
Raymond Rodney Drake (AE); Nekoma
Allen Drew (EE); Rolla
Dorothy Drummond (PSM); Norton
Rebecca Dubbs (GS); Ransom
Dorris Moyne Duckwall (IJ); Abilene
Vesta Fern Duckwall (IJ); Great Bend
Lynn Waite Dunlap (RC); Scott City
Norton Dunlap (EE); Berryton
James John Dunlop (Ar); Detroit
Leslie Crouch Dunnington (CE); Manhattan
Raymond Earl Dunnington (CE); Manhattan
Dean Lewis Dutton (EE); Alta Vista
Hazel Mae Dwelly (HE); Manhattan
John Clayton Dwelly (RC); Manhattan
Albert Thomas Dyal (RC); Topeka
Jack Richard Eakin (RC); Manhattan
Edwin Osborne Earl (EE); Nickerson
Ethel Verne Eastwood (HE); Independence, Mo.
Antoinette Edelblute (IJ); Manhattan
Albert Rowland Edwards (ME); Fort Scott
Miles William Edwards (IC); Perryton, Tex.
Philip Joseph Edwards (EE); Athol
Daniel Peter Ehlers (VM); Omaha, Neb.
Albert Ehrlich (GS); Marion
Herbert Jacob Ehrsam (ME); Enterprise
Hortense Elsbeth Ehrsam (HE); Enterprise
Blanchette Alberta Eisminger (HE); Partridge
Frances Eugenia Ekdahl (HE); Manhattan
Frederick Tomas Elder (Ag); Buneos Aires, Argentina
Robert Elder (Ag); Linwood
Irene Elliott (HE 1; GS 2); Meriden
Jack Elliot (Ag); Morrill
Robert Lovell Elsea (VM); Sweet Springs, Mo.
John Raymond Emel (GS); Winona
Reva Emley (HE); Pleasanton
Ralph Erwin Engel (ChE); Hope
Kermit Vernon Engle (Ag); Abilene
Harlow Cheney Enns (IJ); Inman
Karl Cornelius Enns (GS); Inman
Willis Clyde Epperson (RC); Hutchinson
Nora Blanche Eshbaugh (IJ); Manhattan
Milo Melvin Etrich (IJ); Dodge City
Fern Evans (HE); Chanute
Kennis Evans (EE); Soldier
Ralph Wilson Evans (CE); Washington
William Evans (CE); Barnard
Ray Hunter Ewalt (RC); Manhattan
Mabel Vivian Ewing (RC); Great Bend
Virgil Monroe Fairchild (GS); South Haven
Sidney Lanier Falin (GS); Irving
Elmer Fankhauser (EE 1; RC 2); Madison
Lewis Lee Fankhauser (EE); Madison
Ruby Merle Faris (HE); Kansas City
Marie Ruth Farmer (HE); Kansas City
Carl Faulconer (RC); Manhattan

FRESHMEN—*Continued*

John Virgil Faulconer (CE); El Dorado
Glenn Faulkner (CE); Meriden
Lynn Grey Fayman (LA); Manhattan
Everett Emerson Fear (RC); Bala
Frank Leroy Fear, Jr. (EE); Bala
Thelma Christine Feeser (HE); South Haven
Carl Ralph Feldman (IJ); Sabetha
William Bonsfeild Fenn (Ar); Salina
William Fink (IC); Porterville, Cal.
Firmin Mason Fiolle (EE); Thomas, Okla.
Cecil Fisher (Ag); Fellsburg
Clarence Fisher (Ag); Fellsburg
Harold Kenneth Fisher (GS); Beverly
Charles Russell Fisk (Ar); Broughton
Helen Mary Fitzsimons (PSM); Norton
Marion McKee Flack (CE); Eskridge
Hayden Adelbert Fleck (EE); Maplehill
Theodore Allen Fleck (RC); Wamego
Mary Louise Fleming (HE); Garfield
Allen Carlton Flesch (RC); South Haven
Mark Hays Flick (FME); Manhattan
William Flipse (EE 1; Ag 2); Manhattan
Gwendolyn Flora (IJ); Topeka
Harry Thomas Floyd (RC); Salina
William Boswell Floyd (EE); Manhattan
Glen Robert Fockele (IJ); Le Roy
Frederick Lavern Ford (ME); Marysville
Wesley Turner Ford (RC); Lawton, Okla.
Agnes Forman (IJ); Alton
Alice Etelka Forman (GS); Alton
Amelia Amanda Fosha (HE); Riley
Clarence William Foster (CE);
Muskogee, Okla.
Harry Foster (VM); Valley Falls
James Vernon Fowler (CE); Arcadia
Robert Noll Francis (ME); Cherryvale
Harold Earl Frank (CE); Frankfort
Maurice Benjamin Franklin (EE); Topeka
Lester Raymond Frey (IJ); Manhattan
Wayne Everett Frey (Ag); Manhattan
George Dark Frisbie (ME); Kingman
Ben Fritzemeyer (RC); Stafford
Clarence Chester Fritzemeier (GS); Stafford
Amelia Marie Frohn (HE); White City
Ruth Frost (GS); Blue Rapids
Ervil Scott Fry (Ag); Porterville, Cal.
Joseph Isaac Fry (Ag); Eureka
Dorothy Belle Fulton (HE);
Oklahoma City, Okla.
Zelma Jane Fulton (HE); Argonia
Ralph Dana Gage (RC); Minneapolis
Velmer Edward Gagelman (RC); Great Bend
Anna Sullivant Galbraith (HE); White City
Alfred Byron Gangwer (Ar); Kansas City
Norval Haywood Garinger (AE); Harveyville
Frank Edward Garrett (RC); Overbrook
Paul William Gartner (IJ); Manhattan
Helen Margaret Gates (M); Kansas City
Lester Charles Gates (EE); Seward
Adeline Geffert (GS); Humboldt
Ferol Preston Gehring (Ar);
Bartlesville, Okla.
William Charles Gehrke (Ag); Council Grove
Howard Geitgey (Ag); Anthony
Henry Isely Germann (GS); Fairview
Earle Clayton Gibbs (EE); Peabody
Leland Noble Gibson (IJ); Whitewater
Henry Wilbur Gilbert (CE 1; RC 2);
Manhattan
Gertrude Giles (HE); Hutchinson
Frank Gillard (EE); Girard
Dorothy Lee Gillaspie (HE); Colby
Lloyd Douglas Gillispie (Ag); Jennings
Willard Le Roy Gillmore (GS); Manhattan
Eugene Warren Gilman (EE); Council Grove
Howard Wetmore Gilmore (AE); Oneida
Harold Vern Ginder (FME); Marysville
Malaeska Milton Ginter (EE); Manhattan
Gordon Gillam Gladson (EE); Chanute
Muriel Glasson (HE); Almena
Grace Cecelia Glenn (HE); Manhattan
Arleen Pearl Glick (GS); Jewell
Frank Ziegler Glick (RC); Junction City
Louise Charlotte Glick (HE); Jewell
Clarence Dewain Godfrey (IJ); Concordia
William Wade Gosney (AE); Goddard
Coryell Charles Gove (RC); Junction City
Glenn Huff Graham (ME); Coffeyville
Rollin Robert Graham (ME); Manhattan
Harvey Strack Grammer (RC); Junction City
Donald Milton Grant (GS); Green
Dwight William Grant (EE); Almena
Lois Grasty (GS); Blue Mound
Jerome Harold Greathouse (GS); Coyville
Agnes Betty Greene (RC); Bonner Springs
Harvey Charles Green (Ar); Marysville
Frank Theodore Greene (GS); Kansas City
Howard McLain Greer (LA); Kansas City
Donald Bruce Gregg (PSM); Manhattan
Mariam Virginia Gregg (HE); Topeka
William Ellsworth Gregory (Ag); Walnut
Gerald George Griffin (IJ); Enid, Okla.
Mary Elizabeth Griffiths (GS); Manhattan
James Linsey Grimes (Ag); Burlington
Roderic Grubb (GS); Kanopolis
Lawrence Howard Gunn (Ag); Pratt
Fred Gunselman (GS); Holton
Warren William Guthrie (AE 1; RC 2);
Saffordville
Raymond Collier Haas (EE); Herington
Forest Hills Hagenbuch (Ag); Troy
Louis Henry Hahn (EE); Minneapolis
Dale Evart Halbert (Ag); Abilene
Bryant McIntyre Hale (RC); Hill City
Wesley Halferty (EE); Caldwell
Tiera Lenica Hall (HE); Manhattan
Harold Charles Hamill (RC); Mayfield
Alvin Willis Hamilton (EE); Wichita
Matthew Edgar Hamilton (ME); Argonia
Richard Edward Hamler (Ag); Mulvane
Alice Hammett (PSM); Manhattan
Cecil Edgar Hammett (EE); Manhattan
Roland Harvey Hammond (RC); Kansas City
John Lewis Hancock (EE); Beverly
Leota Christina Hansen (PSM); Willis
Chester Wilford Hanson (EE); Morganville
Arthur Hardesty (CE); Hazelton
Nellie Hardin (HE); Hardtner
Howard Freeman Harmon (ME); Girard
Raymond Thomas Harper (Ag); Frankfort
Ralph Harrell (Ag); Wamego
Fern Amber Harris (HE); Bloomington
Harry Monroe Harris (GS 1; Ar 2); Marion
Ivan Harold Harris (EE); Manhattan
Muriel Margaret Harris (IJ); Herington
Louise Harrop (PSM); Manhattan
Robert Charles Harry (GS); Beattie
Fern Elizabeth Harsh (GS); Cassoday
Maynard Hart (RC); Fredonia
Carl Hartman (GS); Manhattan
Frank Merle Hartman (Ar); Dodge City
Karl Newton Hartzog (IC); Humboldt
Richard Elmer Haskard (RC); Hutchinson
Chester Calvin Hassler (EE); Chapman
Burritt Pingrey Hann (EE); McFall, Mo.
William Thomas Havens (IJ); Manhattan
Roy Harold Hawk (GS); Florence
Frank Hawkins (EE); Manhattan
Marowyn Hawthorne (HE); Gypsum
Dorothy Louise Hax (IJ); Council Grove
Elsie Marguerite Hayden (IJ); Manhattan
Thomas Hunter Hayes (EE); Woodward,
Okla.
Bernard Hays (Ag); Manhattan
James Theodore Hayslip (CE); Manhattan
Harry Sylvester Hazel (Ag); Indianapolis,
Ind.

FRESHMEN—*Continued*

Harry Irwin Hazzard (ME); Coffeyville
Minnie Helen Heath (HE); Manhattan
Fredrik Hedstrom (Ag); Manhattan
Herbert Paul Heidel (GS); Council Grove
Carl Heinrick (Ag); Durham
Janet Hellworth (M); Dodge City
Walter Rudolph Helm (CE); Chanute
Chesley Merril Heltzel (GS); Beloit
Helen Louise Hemenway (IJ); Junction City
Helen Alberta Hemphill (GS); Clay Center
Aileen Elizabeth Henderson (HE); Auburn
Earl William Henderson (GS); Beloit
June Aleen Henderson (HE); Olathe
Leonard Louis Henderson (EE); Ordway, Colo.
Evert Merle Hendrickson (CE); Manhattan
Era Elmira Hendrix (HE); Colorado Springs, Colo.
John Maurice Henry (Ag); St. Francis
Harry Herzer, Jr. (RC); Dodge City
Howard William Higbee (Ag); Fall River
Herman Francis Higgins (RC); Gardner
David John Hill (VM); Hazelton, Pa.
Elmer Louis Hill (CE); Toronto
Emmet Leonard Hill (LA); Jennings
Fairy Mildred Hill (GS); Coffeyville
Kenneth Hill (RC); Manhattan
Clifford Hinkle (EE); Lucerne
Walter Henry Hinz (EE); Abilene
Blanche Hirt (GS); Parkerville
Sherman Stanley Hoar (Ag); Willis
Leland Hobson (EE); Kingman
Charles Robert Hoffman (ME); Independence
Herschel Leroy Hoffman (EE); Marysville
Gordon Sheffield Hohn (IJ) Marysville
Max August Hohnbaum (CE); Mayetta
Arlo Fayne Hollander (EE); Hamilton
Peter Kline Hollis (GS); Delphos
Lester Bardo Holmes (EE); Yoder, Colo.
Joseph Frank Holsinger (CE); Kansas City
Howard Louis Holt (ME); Sedan
Richel Helen Holt (HE); Marquette
Norma Lucile Hook (HE); Silver Lake
Arwin Hoop (ME); Fowler
John Lester Hooper (GS); Robinson
John Converse Hopkins (IC); Chapman
Carl Matthew Horn (GS); Miltonvale
Hazel Jaunita Hotchkiss (GS); Manhattan
Earl Hotchkiss (EE); Manhattan
Charles Burton Howard (Ag); Cottonwood Falls
Nina May Howard (IJ); Abilene
Elmer Fairbanks Hubbard (Ag); Linwood
Mildred Huddleston (HE); Fulton, Ky.
John Golden Huffman, Jr. (CE); Halstead
William Hughes (RC); Lawrence
Katherine Audrey Hugunin (HE); Kirwin
Vance LeRoy Hugunin (EE); Kirwin
Florence Hazel Hull (HE); Downs
Thelma Verdeen Hull (HE); Mankato
Frances Margaret Hunsicker (GS); Manhattan
James William Hunter (Ag); Westmoreland
James Lawrence Hurley (RC); Aurora
Myron Earl Huscher (IC); Concordia
Corwin Hutton (EE); Washington
Clara Betty Huxmann (HE); Arnold
Emma Lou Huxmann (HE); Arnold
Audrey Helen Hybskmann (RC); Corning
Ralph Olston Hobskman (CE); Seneca
Margaret Ingman (HE); Barnes
Marvin Ingram (RC); Wellington
Donald Calvin Inman (Ag); Americus
Joe Innis (CE); Woodward, Okla.
James Eugene Irwin (EE); Le Roy
Ralph Alexander Irwin (CE); Hutchinson
Ralph Raymond Irwin (CE); Le Roy
William Wesley Irwin (Ag); Manhattan
Julian Ellsworth Isenberg (RC); Manhattan
Floyd Edson Israel (EE); Le Roy
Leuvonia Jackson (HE); Lawrence
Alva Clement Jacobson (RC); Manhattan
Harold James (Ag); Macon, Mo.
Mary James (GS); Madison
William Nebeker Jardine (Ag 1; RC 2); Manhattan
George Henry Jenkins (EE); Carthage, Mo.
Harris Warren Jenkins (EE); Kinsley
Kenneth Will Jenkins (Ar); Salina
Harold Sandford Jennings (Ag); Manhattan
Vivian Shade Jewett (HE); Kansas City
Alice Hilda Johnson (GS); Manhattan
Arline Johnson (HE); Frankfort
Delbert Elmer Johnson (RC); Wamego
Dorothy Alice Johnson (HE); Lyons
Elston Johnson (ME); Randolph
Esther Louise Johnson (HE); Kansas City
Francis Johnson (EE); Burlington
George Bengt Johnson (CE); Altamont
Ivan Elmer Johnson (EE); Manhattan
James Foley Johnson (GS); Manhattan
Lois Mary Johnson (HE); Holton
Raymond Delbert Johnson (FME); Washington
Reuben Johnson (CE); Manhattan
Theodore Oliver Johnson (CE); Manhattan
Tracy ElDelle Johnson (GS); Olsburg
Alice Kathleen Johnston (GS); Manhattan
Dorothy Alice Joines (GS); Norwich
Amy Christine Jones (HE); Frankfort
Clifford William Jones (EE); Horton
Mildred Irwin Jones (IJ); Clay Center
Roice Ernest Jones (RC); Downs
James William Jordan (GS); St. John
Chris Jorgensen (VM); Viborg, S. Dak.
John Ralph Justice (EE 1; Ag 2); Manhattan
Mary Ellen Karns (HE); Bucklin
Merllan Kastner (RC); Manhattan
Franklin William Kaull (GS); Livingston, Mont.
Alberta Margotmari Kearnes (IJ); Auburn, Neb.
Ralph Emerson Keele (GS); Manhattan
Howard Laurence Keil (ME); Manhattan
John Oliver Keitch (ChE); Hope
Harry Howard Keller (RC); Hutchinson
Theodore Willard Keller (Ag 1; Ar 2); Manhattan
Robert Warren Kellogg (EE); Sedan
Viola Frances Kelsey (HE); Topeka
James Dillard Kennell (RC); Newton
Everett Raymond Kenyon (ME); Bogue
Milton Mathew Kerr (IJ); Manhattan
John Kesl, Jr. (RC); Cuba
William Kesl (RC); Cuba
Harry Kibler (CE); Sedan
Clarence Kirk Kiene (CE); Berryton
Charles Anthony Killgore (Ag); Nashua, Mo.
Lois Lucille Kimball (HE); Olathe
Kathryn Ann Kimble (M); Miltonvale
Jesse David Kimport (Ag); Norton
Bennie King (Ag); Manhattan
Benton King (IJ); Manhattan
Carl Willard King (GS); Burlington
Charles King (CE); Delia
Hubert Dwight King (IJ); Manhattan
Marion Malcolm King (GS); Manhattan
Philip Lee King (EE); Republic
Ida Lois Kingsley (GS); Inman
Albert Dent Kipfer (EE); Manhattan
Willis Francis Kipper (CE); Belleville
Herbert Henry Kirby (EE); Toronto
James Harold Kirk (Ag); Scott City
Melvin Kirkwood (Ag); Natoma
Joseph Donald Klahr (EE); Netawaka
Edwin Jacob Klein (GS); Clay Center
Kenneth Edwin Klein (RC); Wellington
Victor Jay Klinefelter (Ag); Manhattan
Vivian Fay Klinefelter (HE); Brookings, S. Dak.

FRESHMEN—*Continued*

Vernon Knapp (RC); Salina
Marion Lugene Knetchel (GS); Larned
George Earl Knisel (IC); Solomon
Norma Louise Knoch (HE); Lincoln
Virgil Harley Knorp (EE); Hazelton
Ruth Magdalene Knudson (Ag); Barnes
Keith Louree Kocher (IJ); Glasco
Harry Adolph Koenig (Ar); Chanute
Margaret Annabel Koenig (HE); Nortonville
John William Koerner (GS); Manhattan
Walter Koerner (CE); Manhattan
Lorie Konantz (HE); Olathe
Ruth Louise Kopke (HE); Hutchinson
Merriel Chester Kountz (EE); Topeka
Clona Victoria Krider (HE); Manhattan
Clifton Bryan Kruse (GS); Manhattan
Jerry Charles Krysl (Ag); Lucas
Dorothy Beryl Kuhnle (HE); Concordia
George Kunc (RC); Glasco
Charles William Labadie (Ag); Pawhuska, Okla.
Robert Eddie Labadie (Ag); Pawhuska, Okla.
Mohamed Labib (Ag); Barada, Egypt
Delbert Linelle Lacey (CE); Moran
Ray Godfred Lagerquist (RC); Leonardville
Charles Epps Lagerstrom, Jr. (RC); Topeka
Erma Marie Lala (HE); Kirwin
Theodore Franklin Lala (ME); Kirwin
John Wesley Lamb (GS); St. George
William Arthur Lamb (EE); Bird City
Donald John Lamme (CE); Whiting
Luella Louise Lancaster (IJ); Junction City
Ruth Lancaster (RC); Strong City
William Everett Landon (RC); Mayetta
Alice Luella Lane (IJ); Bucklin
Ralph Richard Lashbrook (GS); Almena
Merlin James LaShelle (RC); Manhattan
William Myers Lathrop (EE); Norton
Reese Edward Laughlin (EE); Pleasanton
Albert Ernest Lauts (VM); Spencer, Neb.
Verna Meryl Lawrence (IJ); Manhattan
Paula Beatrice Leach (HE); Caney
Ralph Orville Learned (Ag); Zenith
Harry Lee Leavell (GS); Allen
Alva Paul Lee (GS); Bonner Springs
Glen Lee (GS); Solomon
Mary Lee (HE); Lawrence
Waldo Haymond Lee (Ag); Keats
Otho Glenn Lehman (Ar); Cleveland, Okla.
Grover Alexander Lemon (EE); Melvern
Philo Hansen Leonard (IJ); Peabody
Nile Smith Lepley (GS); Miltonvale
Murray Lesher (ME); Dodge City
Dorothy Lewis (HE); Waterville
Iris Lewis (PSM); Otego
Alison Thomson Lhotak (ME); Irving
Poy Yueu Lim (RC); Canton, China
Joe Limes (ME); La Harpe
Harold Carl Lindberg (EE); Courtland
Ragnar Nathaniel Lindburg (Ag); Osage City
Donald Jerome Lindsay (EE); Madison
Shepard Keene Linscott (Ag); Farmington
Aubrey Erskine Lippincott (CE); Fort Riley
Guy Edward Lobaugh (GS); Greenleaf
Loren Lobaugh (IJ); Washington
Doris Elsie Logan (HE); Eskridge
Clara Candace Long (GS); Idana
Theodore Walstein Long (EE); Tullahassee, Okla.
Helen Lucile Loomis (HE); Augusta
Catharine Lorimer (HE); Kansas City, Mo.
Ralph Martin Louis (ME); Florence
William Robert Love (EE 1; Ag 2); Bronson
Austin Lovett (Ag); Larned
Dawe Dallas LoVette (GS); Kinsley
Frances Georgia Lowe (HE); Manhattan
George William Lowenheimer (EE); Leavenworth
Ruth Mildred Lowrey (HE); Tribune
Harold Victor Luginbill (Ag); Greensburg
Wallace Eustace Lumb (GS); Wakefield
Forrest Wright Lund (ChE); Protection
Rubin Lundgrin (RC); Lucas
Victor Elmer Lundry (EE); Arlington
Dayton Kent Lutz (GS); Frankfort
Reva Helen Lyne (HE); Solomon
Agnes Ethellyn Lyon (GS); Manhattan
Guy Walker Lyon (ME); Dodge City
Harry Lytle (VM); Oberlin
Verl Ephriam McAdams (Ag); Clyde
Donald McAlister (EE); Hutchinson
Gail McAninch (HE); Stockdale
Gelene Eleanor McAninch (HE); Stockdale
Alice Alene McCammin (IJ); Mankato
June Chester McCamon (GS); Florence
Gerald Clair McClaskey (IJ); Manhattan
Arthur Jesse McCleery (EE); Mankato
Lowell Marvin McClenny (Ag); Valley Falls
Margaret Alice McClintock (HE); Wichita
Helen McClune (RC); Cawker City
Frances McCoin (GS); Wichita
Roy Lewis McConnell (VM); Manhattan
Cecil Ross McCormick (RC); Manhattan
Sallie Evelyn McCrocklin (IJ); Hutchinson
Gilford Edman McCullough (CE); Belleville
James Albert McCutcheon (EE); El Dorado
Arthur McDaniel (ME); Chanute
James Edward McFarland, Jr. (Ag); Girard
Velma Irene McGarvin (HE); Lake City
Clifford Lodell McGinnis (VM); Valley Falls
Darrell Ganash McGraw (Ar); Belleville
James Dan McGregor (ME); Columbus
Merle Kenneth McGregor (RC); South Haven
Jennings McGuire (Ar); Salina
Harry Lyons McIntire (GS); El Dorado
Robert Carlyle McIntire (EE); Belleville
Roswell James McIntosh (RC); Manhattan
Stella Ruth McIntosh (HE); Palmer
Joseph Ronold McKechnie (IJ); Kinsley
Martha Virginia McKee (PSM); Hiawatha
John McKibben (Ag); Preston
Pearl Loretto McKinley (HE); Humboldt
Richard Frank McKinney (CE); Manhattan
William James McLaughlin (CE); Centralia
Robert Dugald McMichael (Ag); Arkansas City
Hugh McNichols (Ar); Burr Oak
Jennie Ida McNish (HE); Morrowville
Sara Luella McNish (He); Morrowville
Lois Elizabeth McNitt (M); Washington
Elbert Machmer (IJ); Wakefield
Simon Thomas Madden (Ag); Auburn
Clifford Ragan Maddy (GS); Utica
Elden Samuel Magaw (GS); Ames
Fred Dale Mahan (IJ); Fort Scott
Hazel Mahon (HE); Silver Lake
Lois Harriet Manchester (GS); Paola
Margaret Helen Manley (HE); Junction City
Preston Leonard Manley (GS 1; Ag 2); Topeka
Charles Richard Mann (IJ); Osborne
Olive Margaret Manning (GS); Peabody
Lawrence Josephus Mardis (GS); Preston
Gerald Wayne Maris (RC 1; EE 2); Hoyt
Harold Charles Markley (RC); Carbondale
Elsie Lena Marshall (GS); Bonner Springs
Donald James Martin (Ag); Fellsburg
Everett Rowland Martin (ME); Dodge City
Garvin Martin (GS); Manhattan
Irene Grace Martin (HE); Hiawatha
Raymond Cecil Martin (EE); Manhattan
James Milton Mason (Ag 1; GS 2); Kansas City
Marian Jessica Mason (IJ); Kansas City
Paul Erastus Massey (EE); Yates Center
Vernor Ives Masters (Ag); Natoma

FRESHMEN—*Continued*

Mildred Maurine Matter (PSM); Manhattan
Alfred William Mausolf (EE); Great Bend
Walter Seamons Mayden (ME); Manhattan
Nora Elsie Mead (HE); Smith Center
Malcolm Tuley Means (RC); Everest
Don Meek (RC); Idana
Joseph Meek (RC); Hiawatha
Norris Meek (ME); Wellington
Charles Hubert Mehaffey (ME); Farmington
LeRoy Emerson Melia (Ag); Ford
Elmer Quentin Mell (CE); Wetmore
Charles Maurice Menard (GS); Paxico
Burr Everett Merrifield (EE); Agra
Elmer Harold Mertel (RC); Kansas City
Lloyd William Merten (AE); Great Bend
August Leroy Meseke (EE); Alta Vista
James Alvin Metz (EE); Kansas City
Lester Meyer (Ag); Linn
Seward Arthur Michelstetter (CE); Hutchinson
Genevieve Katherine Mickelson (HE); Leavenworth
John Louis Mildrexter (RC); Norton
Alfred Leo Miller (GS); Partridge
Clara Grace Miller (HE); Colby
Horace Gratiot Miller (EE); Lebanon
Irene Gertrude Miller (RC); Cottonwood Falls
Leo Miller (IJ); Liberal
Merle Miller (Ag); Takoma Park, D. C.
Victor Henry Miller (RC); Pawnee Rock
Eleanor Mims (M); Garden City
John Lensfred Minor (Ag); Syracuse
Marjorie Blanche Mirick (RC); Halstead
Ida Mae Mitchell (HE); Columbia, Mo.
John Henry Moehlman (EE); Manhattan
Ralph William Mohri (VM 1; GS 2); Kansas City, Mo.
Kenneth Emerson Monfore (EE); Waverly
Leslie Eugene Moody (GS); Ogden
Blanche Emmeline Moore (HE); Idana
Ferne Hilda Moore (GS); Blue Rapids
Muriel Kathleen Moore (HE); Partridge
Charles Vern Morain (RC); Minneola
John Joseph Moran (Ag); Claflin
William Nathaniel Moreland (GS); Manhattan
Glenn Moreton (EE); Wilmore
Clarence Elmer Morlan (ME); Rantoul
Katherine Dyllys Morris (RC); Manhattan
Tom Downing Morris (EE); Manhattan
Francis Wayne Morrison (LA); Ocheltree
Stanley Eaton Morse (Ar); Mancos, Colo.
Harold Edward Mountain (RC); Ada
John Ross Moyer (Ag); Hiawatha
Frederick Mueller (RC); Hanover
Quentin Mueller (RC); Hanover
Blanche Bonnie Muilenburg (HE); Palco
Helen Mae Mullarky (PSM); Glasco
Russell McAllan Munro (GS); Fort William, Canada
Diantha Murdock (GS); Manhattan
Hannah Bridget Murphy (HE); Perth
Walter Harold Murray (CE); Manhattan
Charlotte Cornelia Mutschler (IJ); Leonardville
Harold Edwin Myers (Ag); Bancroft
John Blake Myers (ME); Mound City
Lafe Myers (RC); Clay Center
Harold Orville Nanninga (RC); Leonardville
Jacob John Nanninga (GS); Leonardville
Leslie Levi Neff (EE); Winona
Robert Edward Nelson (GS); Westmoreland
Roma Lucile Nelson (PSM); Ellis
Howard Milton Nester (Ag); Scranton
Jennie Viola Nettrouer (HE); Manhattan
Theodore Newlin (VM); Lewis
Trice Hubert Newsom (RC); Medicine Lodge
Hervey Whitney Nichols (FME); Hutchinson
Lillian Adeline Nicholson (HE); Martin City, Mo.
Orville James Nicholson (ChE 1; Ag 2); Martin City, Mo.
Ralph Elmer Nitcher (CE); Pomona
George Kirkland Nixon (RC); Downs
John Comer Noble (EE); Newton
Gustave Noren (CE); Jamestown
Lawrence Harold Norton (EE 1; GS 2); Kalvesto
Mina Tess Novak (GS); Manhattan
Ivy Beatrix Nudson (HE); Topeka
James Robert Nuttle (AE); El Dorado
Ethel Evelyn Oatman (HE); Lawrence
Rufus Gardiner Obrecht (EE); Topeka
Geraldine Julia O'Daniel (PSM); Manhattan
Oliver Milton Okerlund (Ag); Galva
Loren William Olmstead (Ar); Great Bend
Nels Peter Olson (Ar); Brookville
Kathryn Osborn (HE); Clifton
Robert Richard Osborne (Ar); Kansas City
Albert Horace Ottaway (Ag); Oswego
Robert Leroy Owens (RC); Chapman
Roberta Owens (HE); Russellville, Ark.
Beulah Ozbun (GS); Manhattan
Newell Page (Ag); Detroit
William Hockworth Painter (GS); Meade
Howard Benton Palmer (CE); Aulne
Keith Hillese Parker (EE); Hutchinson
Lucille Louise Parker (IJ); Leavenworth
Velma Edna Parker (HE); Manhattan
Frank Nellis Parshall (RC); Manhattan
Olodine Nina Parshall (HE); Manhattan
Pearl Pauline Parsons (HE); Clearwater
Zella Mae Parsons (IJ); Topeka
Irene Mae Patchen (GS); Jetmore
Gerald Robert Patterson (Ag); Harper
Guy Harold Patterson (GS); Rozel
Milton Alfred Patterson (CE); Ford
Ray Patterson (EE); Goodland
Helen Elizabeth Pattison (HE); Topeka
Horace Jacob Paul (EE); Eskridge
Clara Katherine Paulsen (HE); Stafford
Henry Clayton Paulsen (ChE); Atchison
Harold Hammond Peal (EE); Augusta
Frederick Wilson Pearson (CE); Hutchinson
Walter Culbertson Pierce, Jr. (Ag 1; GS 2); Parlow
Ralph Alfred Pelton (ME); Medicine Lodge
William Harold Penix (EE); Salina
Carrie Dora Penner (GS); Potwin
Lewis Sylvanus Perkins (Ag); Argonia
Paul Chadwick Perry (GS); Fredonia
Kenneth Orval Peters (EE); Utica
Earl Raymond Peterson (Ag); Marquette
Frans Hugo Peterson (CE); Bridgeport
Iver Eugene Ellsworth Peterson (GS); Concordia
Knute Everett Peterson (ME); Enterprise
Mildred Peterson (PSM); Manhattan
Richard Henry Peterson (EE); Marquette
Edmund Lesley Petterson (ME); Topeka
Richard Peyton (EE); Topeka
Mina Pfeiffley (GS); Green
Paul Eugene Pfuetze (GS); Manhattan
Ruth Annie Phillips (GS); Junction City
Eugene Arthur Phinney (EE); Larned
Frances Louise Pickens (HE); Lake City
Jesse Clayton Pickering (Ag); Langdon
Durward Kenneth Pierce (EE); Shade, Ohio
Floyd Parker Pierce (ME); Shade, Ohio
Francis Kinsly Pierce (Ag); Minneapolis
Leonard Milton Pike (Ag); Goddard
Myrul Pike (EE); Goddard
Mary Margaret Pile (HE); Liberal

FRESHMEN—*Continued*

Robert Edward Pirtle (CE 1; GS 2); Council Grove
Conrad Windell Platner (RC); Ellis
Arlene Bishop Pooler (HE); Chapman
Elmer Eugene Porter (EE); St. John
Floy Gracia Porter (HE); Hill City
James LeRoy Potter (EE); Carthage, Mo.
Grace Elizabeth Powell (RC); Macksville
Delbert Fae Preedy (GS); Leoti
Mae Irene Pride (HE); Paxico
John Jesse Province (ME); Stafford
Lumir Stephen Pucelik (VM); Spencer, Neb.
Russell Pugh (RC); Eureka
Frank Hoyt Purcell, Jr. (GS); Manhattan
Robert Hartley Pyle (Ag); Manhattan
George Edward Queen (Ag); Mankato
Ernest Francis Quick (GS); Bellefort
Lawrence Maloy Quinn (CE); Junction City
Clarence Edward Radcliff (CE); Carbondale
Delmas Radia (EE); Rose Hill
Arthur Leo Randel (RC); Manhattan
Marjorie Wilma Rasher (HE); Abilene
Bernice Marie Read (M); Manhattan
Mildred Read (PSM); Coffeyville
Elwood Effenger Reber (EE); Hiawatha
Ross Daniel Reber (ME); Morrill
Lawrence Vincent Rector (EE); Manhattan
Lloyd Claire Reece (EE); Oxford
Esther Reed (HE); Stockton
Marion Joseph Reed (GS 1; FME 2); Turon
Mary Frances Reed (IJ); Holton
Rillia Reed (HE); Manhattan
Robert Louis Reed (GS); Glasco
Thelma Frances Reed (PSM); Concordia
William Symns Reeder (CE); Troy
Edith Teresa Reel (M); Manhattan
John Wayne Rees (EE); Milo
Margaret Frances Rees (PSM); Leoti
Ethel Louise Reicherter (HE); Silver Lake
Leo Reid (ME); Kanopolis
Ray Lewis Remsberg (GS); La Harpe
Ralph Wayne Remy (EE); Strong City
Ethel Retz (GS); Wamego
Joseph Aloysus Rezac (EE); Emmett
Gardiner Roland Rhoades (IJ); Manhattan
Harold Rhodes (ME); Clifton
Floyd Edgar Rice (IJ); Marysville
Charlotte Mae Richards (HE); Madison
Marjorie Anna Richards (GS); Delphos
Ruth Josephine Richards (HE); Manhattan
Marjorie Mae Riner (IJ); Protection
Lyle Emerson Rinker (ME); Great Bend
Charles Philip Riordan (EE); Solomon
Oral Leland Roberts (Ar); Manhattan
Frances Genevieve Robinson (GS); Bucklin
Alfred Ellet Robison (RC); Towanda
Matthew Charles Rodney (RC); Abilene
Martin Roepke (IC); Barnes
Edward Victor Rogers (IC); Louisburg
Laree Leotta Rolph (HE); Delphos
William Alfred Romary (VM); Olivet
Pauline Rob Roper (IJ); Manhattan
Lucille Alice Rose (HE); Agra
Vilo Throant Rose (VM); Ionia
Russell Loyd Rosene (RC); Scandia
Ina Phyllis Clarice Ross (HE); Norway
Dorothy Oden Ross (M); St. John
Jesse Mulvane Ross (EE); St. John
Marshall Ross (GS); Lawrence
Lillian Mae Roush (HE); Manhattan
Edith Juanita Routt (HE); Paola
George Vernon Rowland (ME); Bartlesville, Okla.
James Gordon Royal (RC); Oatville
Vance Mather Rucker (Ag); Manhattan
Marian Rude (GS); Great Bend
Albert Leroy Ruggles (Ar); Salina
Gerna Maude Rundle (PSM); Clay Center
Jean Rundle (HE); Clay Center
Marie Pearl Rush (GS); Marysville
Clare Marie Russel (HE); Manhattan
Elmer Charles Russell (Ag); Manhattan
Harvey Russell (Ag); Topeka
Laureston Russell (VM); Evans Landing, Ind.
Paul Wilfred Russell (Ag); Jewell City
Adrian Leroy Ruth (RC); Scott City
Olga Barbara Saffry (GS); Alma
Martha Mary Sandeen (GS); Stillwater, Minn.
Marjorie Maude Sanders (HE); Clay Center
Wilmar Walton Sanders (Ar); Clay Center
Lillian Sands (HE); Kansas City
Clare Sapp (RC); Hugoton
Marion Cecil Sappenfield (RC); Scranton
Cecil Wilbur Sargent (GS); Riley
Paul Wendell Sargent (Ag); Manhattan
Oren Waren Satterlee (EE); Macksville
Thomas DeWitt Saxe (RC); Wichita
Carl Tracy Schaible (RC); Oakley
Warren Ellsworth Schaules (Ag); Wakefield
Dale Alvord Scheel (Ag); Emporia
Frances Mary Schepp (Ar); Manhattan
Margaret Mary Schippert (GS); Manhattan
Dayton Schmalzried (Ag); Dighton
Marjorie Lenore Schmidler (IJ); Marysville
Albert Irving Schmidt (VM); Kansas City
Leo Schmidt (Ag); Humboldt
Edward William Schneberger (GS); Cuba
Emma Louse Schoonover (GS); Marietta, Ohio
Melvina Schrader (HE); Bavaria
James Clyde Schraeder (RC); Dodge City
Lydia Emily Schulz (GS); Holton
Reginald Hammond Schultze (ME); Natoma
Galen Schwandt (EE); Manhattan
Cleda Elizabeth Scott (GS); Westmoreland
Floyd Scott (RC); Independence
Dorothy Adelaide Scritchfield (GS); Manhattan
Sylvia Scritchfield (HE); Manhattan
William Edwin Sears (GS); Eureka
Esther Sebring (HE); Rossville
Lucile Meriott Sederburg (HE); Leavenworth
Lela Mae Segrist (HE); Manhattan
Joseph Fielding Selby (GS); Kipp
Walter Elsworth Selby (AE); Manhattan
Lucille Anita Sellers (HE); Manhattan
Harold Alfred Senior (EE); Independence
Thelma Shafer (M 1; HE 2); Fredonia
Ella Marie Shaw (PSM); Junction City
George Douglas Shea (CE); St. George
Lee Sheets (CE); Burlington
Elizabeth Spencer Sheetz (RC); Chillicothe, Mo.
Frank Spencer Sheetz (CE); Chillicothe, Mo.
James Arthur Sheldon (EE); McLouth
Charles Russell Shellenberger (RC); Ransom
Howard Ardworth Sherman (EE); Elk City
Jay Lester Sherwood (EE); Grenola
Christiana Marie Shields (HE); Lost Springs
Donald William Shields (CE); Hoxie
Leslie Marion Shields (EE); Leavenworth
Lester Le Roy Shields (CE); Selden
Paul Brown Shivel (ChE); Coffeyville
Kathleen Serena Shoffner (HE); Manhattan
Charles Shoyer (ME 1; GS 2); Soldier
Raymond Earl Shrader (IJ); Concordia
Harry Lawrence Shubert (GS); Frankfort
Robert Shumate (ME); Rush Center
Jesse Sidener (Ag); Ada
Ivan Orel Simmons (Ag); Americus
Vernon Dale Simmons (RC); Wamego
Ernest Harold Simpson (Ag); Conway Springs
Paul Maurice Simpson (GS); Harper
Howard Dean Skaggs (RC); Fredonia
Garnett Irene Skinner (HE); Mankato
Mildred Louise Skinner (HE); Mankato
Mildred Loveless Skinner (HE); Marion
Paul Alonzo Skinner (RC); Manhattan
Agnes Mary Slatten (HE); Rosedale

FRESHMEN—*Continued*

Josephine Frances Slattery (RC); Manhattan
Clarence Douglas Slaybaugh (CE); Abilene
Glenn Daniel Slaybaugh (EE);
St. Joseph, Mo.
Clarence Archibald Sloan (EE); Dalhart, Tex.
Claude Wilber Sloan (EE); Dalhart, Tex.
Frank Dudley Smalley, Jr. (RC);
Kansas City
John Frederick Smerchek (GS); Cleburne
Charles Francis Smith (EE); Beloit
Chester Smith (Ag 1; RC 2); Fellsburg
Clifford Smith (ChE); Hutchinson
Dwight Daniel Smith (EE); Udall
Gerald Anthony Smith (RC); Delphos
Howard Leaverne Smith (RC); Axtell
James Everett Smith (Ag); Woodward, Okla.
Louis Harrison Smith (VM); Lebo
Martha Agnes Smith (GS); Durham
Norman Courtland Smith (GS); Lane
Robert Clay Smith (GS); Cherryvale
William Holcomb Smith (EE);
Cottonwood Falls
Anna Mae Somerville (HE); Manhattan
James Milton Soper (Ag); Kansas City
Laura Cynthia Sorenson (HE); Gypsum
Bernice Elaine Souder (HE); Dodge City
Lois Eleanor Sourk (GS); Goff
Ellis Homer Spangler (EE); Newton
Albert Spealman (ME); Marysville
Inez Irene Spear (HE); Bushong
LaVerne Herbert Spears (RC); Manhattan
Glyn James Spena (EE); Collyer
Stanley Samuel Spencer (RC); Oakley
Marie Elizabeth Sperling (IJ);
Woodward, Okla.
Byron Lee Spray (ChE); Moline
Donald Alvin Springer (GS); Manhattan
Noble Jacob Springer (Ag); Garrison
Helen Sproul (M); Manhattan
Joe Otto Stalder (CE); Morrill
Meryl Carolyn Stark (HE); Manhattan
Need Stark (RC); Bonner Springs
Alta Mary Stephens (HE); Manhattan
Edward Albert Stephenson (Ag); Alton
Amy Viola Stewardson (HE); Colby
Edna Coral Stewart (HE); Morganville
George Doster Stewart (RC); Manhattan
Glenn Delbert Stewart (EE); Saffordville
Harvey Stewart (Ag); Americus
Hugh Leonard Stewart (CE); Vermillion
James Arlie Stewart (Ag); Abilene
Mary Anne Stewart (GS); Abilene
Samuel Roger Stewart (Ag); Vermillion
David Huston Stickley (Ag); Canadian, Tex.
Almeron Willis Stillwell (ME); Wichita
Mary Elizabeth Stitt (M); Topeka
Thelma Helen Stitt (HE); Liberal
Lee Randell St. John (CE); Morland
Ross Alonzo St. John (EE); Morland
Louise Stockwell (GS); Larned
Jay Lawrence Stoddard (GS); Manhattan
Jake Paul Stofer, Jr. (RC); Scandia
Clyde Arlie Stonestreet (GS); Cullison
Emerson Young Stott (GS); Winfield
Gladys Jaunita Stoops (GS); Manhattan
Stuart Stout (GS 1; Ar 2); Fort Scott
Paul Spencer Strand (IJ); Manhattan
Fern Lois Straw (PSM); Wichita
Mary Marjorie Streeter (HE); Hiawatha
William Streeter (LA 1; IJ 2); Manhattan
Louis Allen Street (EE); Topeka
George Henry Strickenfinger (RC); Horton
Ardyth Ethel Strine (GS); Monrovia
Leonard Strobel (RC); Pratt
Bennett Thorne Stryker (EE); Waterville
Evelyn Louise Sturgeon (HE); Cassoday
Flourine Stutz (HE); Manhattan
George Edward Stutz (GS); Manhattan
Mary Lena Stutz (HE); Manhattan
Emil McKee Sunley (GS); Paola
Graydon Houghton Sutherin (ME); Topeka
Wendell Holmes Swain (CE); Soldier
Obelia Edrena Swearingen (HE);
Edwardsville
Ruby Elen Swearingen (RC); Manhattan
Frances Sykes (HE); Barry, Ill.
Josephine Taggart (HE); Goodland
Margaret Elizabeth Tamm (HE); Downs
Carl Tanner (EE); Newton
Raymond Carson Tate GS); Oakley
Donald Noel Taylor (Ag); Topeka
Grace Elizabeth Taylor (HE); Manhattan
John Edward Taylor (Ag); Onaga
Paul Elwin Taylor (Ar); Chapman
Donald McCrea Telford (ChE); Manhattan
Juanita LaVern Telford (GS); Manhattan
Philip Langworthy Thacher (GS); Waterville
Allen Charles Theiss (VM); Hutchinson
Eugene Ware Theiss (VM); Hutchinson
Elwin Ernest Thoes (PSM); Alma
Cora Esther Thomas (HE); Narka
Perry Marsden Thomas (GS); Racine, Wis.
Frank Arnold Thompson (EE); Hoyt
Henry Warden Thornton (GS); Le Roy
Manford Preston Thornton (RC);
Cherryvale
Orville William Thurow (RC); Macksville
Raymond Jennison Tillotson (EE); Shields
Anna Lena Tinkler (HE); Gypsum
James Norwood Tobias (RC); Manhattan
Bernie Lorenzo Toliver (RC); Abilene
Ralph Tompkins (CE); Bernard
Harold Beach Tomson (Ag 1; IJ 2);
Wakarusa
Helen Louise Toothaker (GS); Phoenix, Ariz.
Willard Edwin Topping (RC); Overbrook
Joseph Emmett Torrance (Ag);
Council Grove
Blaine Allman Tull (RC); Manhattan
Bessie Eva Turner (HE); Milton
Tom James Turner (CE); Madison
Malcolm Earnest Twidale (RC);
Kansas City, Mo.
Agatha Neese Tyler (RC); Fredonia
Lorna Opha Tyner (HE); Overbrook
John William Tyson (Ag); Olathe
Alice Uglow (HE); Ames
Margaret Undine Uhl (HE); Holton
John Fred Umberger (RC); Elmdale
Daphna Pauline Underwod (IJ);
Cottonwood Falls
Loren Francis Ungehauer (Ag); Centerville
Ted Unruh (Ag); Pawnee Rock
George Leroy VanBuren (GS); Burrton
Carolyn Jean Vance (GS); Topeka
Clifford Herbert Vance (IJ); Mankato
Kenneth King Vanderbilt (Ar); Abilene
George Ruben Vanderpool (CE); Meade
Harry Lee Vanderwilt (EE); Solomon
Alexander Van Pelt (Ag); Carthage, Mo.
Samuel Alonzo Van Voorhis (Ar);
Yates Center
George Robert Varney (IJ); Jewell City
Theodore Roosevelt Varney (GS); Manhattan
Ralph Everett Varvel (ChE 1; RC 2);
Burlington
Beatrice Eleanor Veeh (HE); Logan
Archie Morgan Veitch (Ar); Kanopolis
Eleanor Marie Veroda (PSM); Cuba
Adrienne Marie Viergever (GS); Willard
Ralph Albert Vinson (EE); Larned
Margaret Elaine von Leonard (M);
Hutchinson
Leila Floretta Vosburgh (PSM); Macksville
Forrest Romaine Wade (PSM); Manhattan
George Wagner (Ag); Whiting
James Cecil Wagner (ME); Concordia

FRESHMEN—*Concluded*

Henry Castle Walbridge (Ag); Russell
Hayes Walker, Jr. (Ag); Kansas City, Mo.
Lewis Merritt Walker, Jr. (IJ); Abilene
Vernon Clair Walker (EE); Picher, Okla.
Walter Francis Walker (M); Kiowa
William Irving Walker (Ag); Manhattan
Dorothy Ellen Wallingford (HE); Horton
Ruby Walt (M); Manhattan
Max Winston Walton (IJ); Sterling
Letha Anna Wangerin (IJ); Kensington
Albert Noll Ward (EE); Highland
Vera Warnock (HE); Hutchinson
Edwin Otto Wartensleben (Ag); Sheridan, Wyo.
Vance Edgar Washington (Ag); Manhattan
Genevieve Wasson (PSM); Neosho, Mo.
Edgerton Lynn Watson (Ag); Beloit
Joseph Ardrey Watson (GS); Sedan
Elmer Lawrence Watters (RC); Marysville
Charles Webb (ME); Sedan
Gladys Nellie Webber (PSM); Logan
Edward Paul Weber (ME); Liberty
Charles Barnhardt Weeks (EE); Udall
Wilbur Alan Weimer (EE); Girard
Janet Wells (RC); Belleville
Jay Weaver Wells (IJ); Kansas City
Chester Enoch Werhan (GS); Bennington
George Burton Werts (GS); Beloit
Raymond Wescoat (GS); Formoso
Ramona Whealy (HE); Wellington
Harold Wheaton (EE); Phillipsburg
Louis Whirlwindhorse (Ag); Allen, S. Dak.
Bessie Elizabeth White (HE); Wetmore
Hays Vaughan White (Ag); Mankato
Hugh Erwin White (EE); Kingsdown
Mary Frances White (GS); Manhattan
Virgell John White (AE); Ada
Virginia Ellis White (HE); Quincy, Ill.
Walter James Whiteside (Ar); Spearville
Royden Keith Whitford, Jr. (EE); Washington, D. C.
Mary Whitten (HE); Wakarusa
Craig Wickham (Ag); Manhattan
Hazel Florence Wickham (HE); Manhattan
Louis George Wieneke (ChE); Manhattan
Leslie Earl Wilkie (Ar); Belleville
Frances Elizabeth Willhoite (PSM); Manhattan
Bertha Alice Williams (GS); Manhattan
Charles Kenneth Williams (Ar); Elgin
Esther Elizabeth Williams (GS); Manhattan
Joe Arthur Williams (CE); Hazelton
Juanita Marie Williams (GS); Guthrie, Okla.
Marvin Vernal Williams (EE); Scranton
Vera Willis (PSM); Manhattan
Helen Mildred Wilmore (HE); Sedgwick
Anna Zerita Wilson (HE); Council Grove
Deo Orval Wilson (RC); Burlington, Colo.
Francis Dale Wilson (Ag); Jennings
Francis Lesher Wilson (IJ); Abilene
Hal Spring Wilson (GS); Valencia
Inez Helen Wilson (IJ); Eskridge.
Mary Margaret Wilson (HE); Manhattan
Richard Sewell Wilson (GS); Beloit
Robert Lee Wilson (IJ); Kinsley
Ruth Wilson (HE); Kinsley
Helen Emma Winkler (HE); Rozel
Louis Fred Winkler (GS); Rozel
Claude Jennings Winslow (GS); Tonganoxie
Howard James Winters (EE); Oswego
Glen Franklin Wiswell (Ag); Ocheltree
Charles Walter Withey (GS); Home
Leslie Wolfe (Ag); Johnson
Floyd Arson Wolfenbarger (Ar); Manhattan
Arthur Wolgast (Ar); Alma
Lester LeRoy Wood (Ag); Bonner Springs
Ruth Esther Wood (HE); Overland Park
Ned Woodman (LA); Manhattan
Helen McCormick Woodward (HE); Yates Center
John Woodward (GS); Yates Center
William Fay Woodward (IJ); Yates Center
Ivan Woodworth (GS); Clyde
William Henry Woolman (GS); Simpson
John Howard Worley (GS); Formoso
Louis Albert Wray (GS); Courtland
Dorwin Clair Wright (Ag); Bronson
Joseph Harvey Wright (IJ); Minneapolis
Marion Wright (HE); Okarche, Okla.
Rachel Wright (HE); Welsh, La.
Walter Irvin Wright (EE); Larned
Wilma Gertrude Wylie (HE); Quinter
George Oren Yandell (RC); Wilson
Horace Fetzer Yoder (ME); Morrill
Kenneth Dale Yoder (Ar); Ellis
Alfred Henry Zeidler (RC); Manhattan
Maynard Eugene Zeller (Ag); Manhattan
Percy Lee Zibell (IJ 1; Ag 2); Holton
Roy Rudolph Zurbuchen (EE); Alta Vista

## SPECIAL STUDENTS

Joseph Omer Abbott (GS); Manhattan
Dana Hoffman Anderson (GS); Manhattan
Lottie Sybell Andrews (GS); Junction City
Robert Eugene Baehler (Ag 1; GS 2); Manhattan
Jack Michael Baney (GS); Pratt
Alta Elizabeth Barger (GS); Manhattan
Bessie Ethel Beougher (GS); Manhattan
Robert Walker Berry (Ag); Manhattan
Rachel Romans Biggs (GS); Fort Riley
Millard Bland (GS); Concordia
Thomas Bragg, Jr. (GS); Dodge City
Frank Brandejsky (Ag); Manhattan
Lois Margaret Burkhart (GS); El Dorado
Sigfrid Oscar Carlson (GS); Lasita
William Wright Carpenter (GS); Coffeyville
Charles Wayne Chase (Ag); Cleveland, Ohio
Frances Lee Clammer (GS); Manhattan
Maurice Knox Cleland (GS); Hoyt
James Eugene Conklin (GS); Hutchinson
Pearle Zelma Copenhafer (GS); Manhattan
Margaret Corby (HE); Manhattan
Ildefonso Ferruia Correia (Ag); Parana, Brazil
Harold Lee Crawford (Ag); Paola
Floyd Hunter Creighton (GS); Manhattan
Henry Mason Crocker (Ag); Matfield Green
Mary Elva Crockett (GS); Manhattan
Rubye Crowl (GS); St. Francis
Clifford Wilkin Currie (GS); Manhattan
Dorothy Mae Davis (GS); Delavan
Harry Ellsworth Day (GS); Kansas City
Milton David Dealy (GS); Topeka
Edgar Denny (GS); McLouth
Perushottam Yadeorao Deshmukh (Ag); Nagpur, India
Thomas Vincent Donoghue (GS); Hoisington
Glen Edward Eakin (GS); Manhattan
John Vance Eastwood (GS); Manhattan
Berenice Geraldine Elliot (GS); Manhattan
Glenn Vernon Ely (GS 1; Ag 2); Inman
Erma Lora Ensign (HE); Waterville
Ruth Pearl Faris (GS); Kansas City
Elsie Fielding (GS); Manhattan
Alice Fitch (HE); Manhattan
Willis Harold Flamm (GS); Amarillo, Tex.
Ernest Rixey Foltz (EE 1; GS 2); Belle Plaine
Cecil Paul Foote (Ag); Wichita
Monica Frances Gillgannon (HE); Delia

SPECIAL STUDENTS—*Concluded*

Kingsley Walton Given (GS); Manhattan
Russell Wayne Good (Ag 1; GS 2); Cherryvale
Harley Hooker Goodwin (GS); Manhattan
Dorothy Leon Gray (GS); Joplin, Mo.
Edward Maurice Gregg (GS); Frankfort
Earl Griffiths (GS); Coffeyville
Thomas Joseph Griffiths (GS); Manhattan
Lena Gertrude Grossman (GS); Manhattan
Don Haegert (GS); Manhattan
Lloyd Raymond Hansen (Ag); Willis
Wilita Daphne Harnly (GS); Manhattan
Mary Caroline Harrison (GS); Galena
Kenneth Charles Hawkinson (GS); Bigelow
Carl Hayes (Ag); Hutchinson
Winifred Haynes (GS); Grantville
Lawrence Noel Hedge (GS); Manhattan
Lucille Herr (GS); Hutchinson
Sherman Adison Herren (GS); Manhattan
James Waldo Hinshaw (Ag); Eureka
Oscar Thurmond Hobson (EE); Vernon, Tex.
John Paul Holt (GS); Abilene
Elmer Earl Hoover (EE); Manhattan
Mina Mae Hudson (HE); Ashland
Raymond Percy Hunsberger (GS); Mount Hope
William Alex Hunter, Jr. (GS); Manhattan
Ronald Vanten Hutton (GS); Manhattan
Lewis Threlkeld Igleheart (GS); Manhattan
Christine Dorothy Immer (GS); Hutchinson
Alice Camilla Jobes (HE); Merriam
Jake Charles Julien (Ag); Bartlesville, Okla.
Jessie Wright Keyes (HE); Manhattan
Marian Gibbonney Kirkpatrick (GS); Manhattan
Theunis Munnik Kleinenberg (Ag); Pietersburg, S. Africa
Avery Lesliee Leatherman (Ag 1; GS 2); Dunavant
Jack Harris Linscott (EE); Manhattan
Edward William Lutz (GS); Hutchinson
Mary Mildred McGirr (GS); Vinton, Ia.
*George Roy McMahon (Ag); Toronto
Martha Doris MacElvaine (GS); Topeka
Arthur Byrd Maxwell (GS); Clay Center
Frank Allen Meyers (GS); Topeka
A. Q. Miller, Jr. (GS); Salina
Minda Frances Milner (HE); Salina
Arthur Clifford Mittendorf (GS); Hutchinson
Em Elwell Moore (GS); Nowata, Okla.
Charles Roger Mosshart (GS); Manhattan
Gerald Irving Moyer (Ag); Manhattan
Dorothy Murphy (HE); Corbin
Channing George Myers (GS); Manhattan
Ruth Nettleton (GS); Lenora
Robert Bragan O'Bryan (GS); Fort Scott
Alice Eugenia Olson (GS); Manhattan
Fred Donald O'Malley (GS); Junction City
Eli Benjamin Packer (G S); Liberal
Lowell Parsons (GS); Manhattan
Mildred Content Peck (GS); Jewell
Ura Peirce (HE); Manhattan
Frank Albert Peterson (Ag); Olathe
Arthur DeVere Pollom (GS); Chehalis, Wash.
Thomas Allen Poole (CE); McDonald
Accacio Canimbra da Rocha (Ag); Rio Grande, Grazil
Mary Magdalene Rolfe (GS); Wetmore
Minnie Grace Ryan (GS); Manhattan
Mildred Sanders (HE); Leavenworth
Roy Daniel Scott (Ag); Diamond, Mo.
Richard Maurice Sears (Ag); Eureka
Theodore Oliver Sederquist (GS); Herington
Randall Joel Shaw (GS); Medicine Lodge
Edwin Denison Shields (GS); Manhattan
Orville Theodore Shurtz (EE); Logan
Leonidas Alexander Siamy (Ag); Cherbine, Egypt
Opal Lucile Simons (HE); Agra
Anne Sisson (HE); Manhattan
Sister Mary Nicholas Arnoldy (GS); Manhattan
Sister Cresentia Giersch (GS); Concordia
Sister Stanislous Kelly (GS); Manhattan
Helen Jane Sparks (GS); Manhattan
Norman Flett Spear (GS); Bushong
Leona Stillwagon (GS); Kansas City
Helen Esther Vanquist (GS); Randolph
Birdie Von Trebra (GS); Oswego
Clarence Dale Walker (Ag); Yewed, Okla.
Philip Henry Weidlein (GS); Manhattan
Lois Edna Welch (GS); Glen Elder
Carolyn Marie Welsh (HE); Fairbury, Neb.
Harold Jay Welsh (Ar); Blackwell, Okla.
Lovell West (GS); Wichita
Rupert Kress Wey (Ag); Wichita
Grace Marie Weyer (Gs); Manhattan
Lewis Dixon Wilkinson (Ar); Topeka
Dixie Monroe Wingfield (Ag); Junction City
Merrill Briggs Wolf (Ag); Marion
*Rockford Glenn Yapp (Ag); Manhattan

## SUMMER SCHOOL

Alice Abbott; Gretna
Dorothea Ackley; Portis
Ethel Charlotte Adam; Wakefield
Ralph Adams; Norton
Margaret Ahlborn; Smith Center
Glenn Allen Aikins; Valley Falls
Louise Josephine Alexander; Holcomb
Elsie Ida Allen; Maplehill
Glen Allen; Burlington
Velma Louise Allen; Burlington
Agnes Mae Allender; Junction City
*Fred Denman Allison; Hazelton
Alice Miriam Allison; Florence
Verna Allmon; Columbus
Guadalupe Celaya Alvarado; Manhattan
Albert Howard Ames; Downs
Maurine Esther Ames; Moline
Frances Winifred Amos; Manhattan
Robert Louis Anderes; Kansas City
Anna Anderson; Haddam
Eunice Miriam Anderson; Phillipsburg
Fern Frances Anderson; Manhattan
Frank DeMoss Anderson; Iola
Glyde Estella Anderson; Manhattan
Hazel Lillian Anderson; Bronson
Laura Marjorie Anderson; Leonardville
Mae Anderson; Neosho Falls
Carol Esther Ankeny; Manhattan
Ruth Leah Anthony; Wayne
Alfred Lewis Arnold; Manhattan
Leah Ellen Arnold; Manhattan
Edward Leroy Askren, Jr.; Manhattan
Dustin Avery; Wakefield
Margaret Avery; Wakefield
Alice Lenore Axelton; Garrison
Ellis Buchanan Babbit; Hiawatha
Leone Lera Bacon; Kingman
Mildred Mae Baer; Manhattan
Martha Ruth Bainer; Manhattan
Marvel Leon Baker; Syracuse
Walter Buswell Balch; Lansdoune, Pa.
Esther Letha Bales; Manhattan
Ethel Yolande Bammes; Manhattan
Edna Florence Bangs; Manhattan

* Under auspices of the U. S. Veterans' Bureau.

SUMMER SCHOOL—*Continued*

Alvin Kornelius Banman; Lyons
Galen Andrew Barber; Topeka
Paul Willis Barber; Topeka
Alta Elizabeth Barger; Manhattan
Paul Jones Barger; Manhattan
Atwell Stuart Barkley; Manhattan
Vivian Joy Barnard Manhattan
Philip Asa Barnes; Blue Mound
Melba Jarrett Barney; Hoyt
Florence Ann Barnhisel; Wichita
Murlin Clyde Barrows; Clifton
Lawrence Floyd Barth; Manhattan
Marjorie Fern Barth; Manhattan
Nelson Suplee Barth; Manhattan
Vera Evelyn Bartlow; Waterville
Harold Ralph Batchelor; Manhattan
Laura Belle Baxter; Manhattan
Paul Everette Bays; Arkansas City
Ingnacio Becerra; San Nicolas, Buenos Aires, Argentine
Lillian Louise Bedor; Hollis
Marcella Marie Beerhalter; Junction City
Marcia Alice Beggs; Manhattan
Drew Edward Bellairs; Cherryvale
Glenwood Clements Bengtson; Kansas City
Margaret Mary Beninga; Riley
Emily May Bennett; Manhattan
William Bergh; Newton
Robert Walker Berry; Manhattan
Christina Leola Bertsch; Mayetta
Anna Lillian Best; Manhattan
Rosa Catherine Best; Manhattan
Neva Betz; Asherville
Dean Oscar Bickford; Phillipsburg
Ada Grace Billings; Manhattan
Fred Goff Billings; Manhattan
Helen Ann Blair; Mulvane
Werner Jesse Blanchard; Manhattan
Millard Bland; Concordia
Dollie Blanks; Manhattan
Laura Viola Denman Blanks; Manhattan
Robert Franklin Blanks; Manhattan
Stella Blanks; Manhattan
Edna Isabelle Blayney; Manhattan
Mary Boid; Manhattan
Pearl Eugenia Boid; Manhattan
Maree Mercedes Boller; Manhattan
Mary Adda Boone; Manhattan
Ralph Wesley Boone; Colony
Geneva Dorothy Booth; Fairview
Astrid Anna Borg; Manhattan
John Harrison Borror; Westphalia
Ferdinand Hugo Bosman; Moemfontein, S. Africa.
Leona Katherine Boston; Washington
Emogene Bowen; Manhattan
Leslie Jenks Bowman; Lebo
Ada Pearl Bradley; Wabaunsee
Maurice Bradley; Winfield
Thelma Edna Bradley; Clifton
Helen Thurston Brainard; Manhattan
Carrie Brandejsky; Severy
Lille Pauline Brandly; Manhattan
Ruth Dorothy Brandt; Manhattan
Chauncey Allen Brantingham; Kansas City
Edna Waunetta Fern Brelsford; Leonardville
Margaret Angeline Brenner; Waterville
Grace Elizabeth Bressler; Manhattan
Esther Bertha Breunsbach; Liberty, Neb.
Edna Brock; Wamego
Bertha Caroline Brockish; Westmoreland
Margaret Mary Brockish; Westmoreland
Awilda Brown; Winfield
Duke Daniel Brown; Manhattan
Edna Mae Brown; Riley
Evelyn Bell Brown; Westmoreland
Helen Brown; Carbondale
Orpha Brown; Edmond
Rowena Luella Brown; Alta Vista
Vira Brown; Edmond.
Chester Leroy Browning; Kingsville, Mo.
Gladys Olive Brubaker; McPherson
Mable Esther Brubaker; McPherson
Ruth Brumbaugh; Vesper
Esther Bruner; Manhattan
Florence Grace Bruner; Manhattan
Thomas Walter Bruner; Lakin
Harry Ray Bryson; Manhattan
Joseph Daniel Buchman; Council Grove
Margaret Reasoner Buchman; Anthony
Blanche Ethel Burns; Scandia
Maurine Burson; Manhattan
James Burt; Manhattan
Hiram Gilbert Burt; Manhattan
Margaret Kirby Burtis; Manhattan
Margaret Freda Burwell; Liberal
Marvel Sara Bushby; Belleville
Dwight Calvin Bushy; Muscotah
Elgin Roy Button; Topeka
Lottie May Butts; Manhattan
Esteban Agnilar Cabacungan; Santiago, Isabela, P. I.
Imogene Warner Call; Manhattan
Ira Oren Call; Manhattan
Ethel Marie Callahan; Manhattan
*Owen Callahan; Morehead
Roy Raymond Cameron; St. George
Edna Dolores Campbell; Hanover
Elizabeth Virginia Campbell; Manhattan
Mildred Leora Campbell; Hollis
Ruth Aileen Campbell; Springfield, Mo.
Lillie Adelene Canary; Clyde
*Dave Cardwell; St. Joseph, Mo.
*Aura Melvin Carkuff; Manhattan
Nellie Carlson; Vermillion
Nancy Genevieve Carey; Manhattan
*Harry Edwin Carrier; Topeka
*Doyle Henry Carter; Trenton, Mo.
Mildred Carter; Le Roy
*Sherman Harold Carter; Le Roy
Thelma Carter; Le Roy
Harold Nelson Cary; Ogden
Pearl Beth Cassell; Manhattan
Stanley Caton; Delmar, Iowa
Gertrude Berniece Chaffee; Belvue
Edna Neetta Chapin; Westphalia
Ira Nichols Chapman; Manhattan
James William Chapman; Brookfield, Mo.
Katherine Eleanor Chappell; Manhattan
Kenneth Romayne Chappell; Manhattan
Imogene Marjorie Chase; Manhattan
Anna Chilcott; Manhattan
Ernest Iden Chilcott; Manhattan
Mary Chilcott; Manhattan
O. M. Chilcott; Esbon
Etta Estella Chillson; Manhattan
Margaret Claassen; Beatrice, Neb.
Florence Roberta Clarke; Manhattan
Mary Jane Clark; Anthony
Paul Frederick Clark; Kansas City, Mo.
Roy Engle Clegg; Altoona
Cecil Clements; Mulvane
Charles Robert Clothier; Manhattan
Donald Coburn; Kansas City
Owen Lovejoy Cochrane; Manhattan
Burton Ellsworth Colburn; Manhattan
Evelyn Charlotte Colburn; Manhattan
Edgar Elwood Coleman; Alma
Hubert Lee Collins; Wellsville
Leslie Irl Collins; Manhattan
*Ralph Collins; Marysville
Ursula Oldham Collins; Manhattan
Raymond John Coltharp; Bala
Evelyn Marilda Colwell; Manhattan
Irene Mildred Compton; Manhattan

* Under auspices of the U. S. Veterans' Bureau.

SUMMER SCHOOL—*Continued*

Ruth Miriam Connett; Manhattan
Bernard John Conroy; Manhattan
Gertrude Vivian Conroy; Manhattan
Irene Conroy; Manhattan
Marguerite Josephine Conroy; Manhattan
Nelle Isabelle Conroy; Manhattan
Edward Chapman Converse; Manhattan
Frances Ella Converse; Manhattan
George Curtis Cooksey; Manhattan
Victor Vincent Cool; Manhattan
Elsie Leigh Cope; Beattie
Pearle Zelma Copenhafer; Manhattan
Lloyd Marion Copenhafer; Manhattan
George William Corbet; Leona
Catherine Elizabeth Corey; Kansas City
Ildefonso Ferreira Correia; Parana, Brazil
Marie Correll; Manhattan
Gertrude Helen Costello; Carlton
Mary Louise Cox; Downs
Judith Briggs Craig; Manhattan
Clara Lena Cramsey; McPherson
Ruth Irene Crandall; Corning
Gracia Mae Crawford; Vermillion
Floyd Hunter Creighton; Manhattan
Nettie Elizabeth Crissman; Barnes
Juanita Martha Crocker; Manhattan
Mary Elva Crockett; Manhattan
Annie Georgianna Crouch; Manhattan
Bert Andrew Crowder; Topeka
Kathryn Mae Crowder; Manhattan
Georgia Mary Crowl; Manhattan
Ruby Elizabeth Crowl; Manhattan
Margaret Elizabeth Crumbaker; Manhattan
Mary Natalie Cruzen; Gallatin, Mo.
Edward Cunningham; Manhattan
Beth Suzanne Currie; Manhattan
Erma Evangeline Currin; Manhattan
Grace Marie Currin; Manhattan
David Earl Curry; Dunavant
Frances Rebekah Curtis; Kansas City
Raymond Alfred Cyr; Ames
Stella Agnes Czarnowsky; Lincolnville
Charles Otto Dailey; Agenda
Emily Ruth Dailey; Agenda
Forrest Everett Dallas; Harveyville
Gladys Pauline Dallas; Harveyville
Blossom Loraine Davidson; Eskridge
Althea Grace Davies; Manhattan
Edgar William Davis; Lyons
George Stuart Davis; Clay Center
Lester Eugene Davis; Manhattan
Raymond Howard Davis; Effingham
Grace Lavine Davison; Michigan Valley
Faith Dawley; Manhattan
Dora Hope Dawley; Manhattan
Lucille Minerva Dean; Manhattan
Marjorie Dean; Edgerton
Antonio Villarreal de la Garza; Monterey, Mexico
Carl Oliver Dell; McPherson
Ora Anna DeMoss; Topeka
Eleanor Elizabeth Dempsey; Manhattan
Rowland Leeds Dennen; Manhattan
Dorothy Jean DeVault; Ocheltree
Vivian Jessie Dial; Riley
William Dickens; Manhattan
Charles Orville Dirks; Manhattan
Bonna Louella Dittmar; Manhattan
Jean Swift Dobbs; Manhattan
*David Neill Donaldson; Ft. Collins, Colo.
Juanita LaVone Donigen; Greenleaf
*George Joseph Dooley; Manhattan
James Phillip Douglass; Marysville
*Gerald Roderick Dowd; San Francisco, Cal.
Alberta Myrtle Doyle; Douglass
Maggie Doyle; Douglass
Margaret Dubbs; Manhattan
Jack Wilbur Dunlap; Manhattan
Lynn Waite Dunlap; Manhattan
Doris Irene Dwelly; Manhattan
Hazel Mae Dwelly; Manhattan
Glen Edward Eakin; Manhattan
James William Eby; Medicine Lodge
Alberta Edelblute; Manhattan
Alfred Douglas Edgar; Manhattan
Lois Adeline Edgerton; Randolph
Alice Dorothy Edstrom; Stromsburg, Neb.
Bessie May Edwards; Athol
John William Egger; Ellis
Leone Louise Eichem; Wamego
Charlie Louis Eis; Manhattan
Milton Stover Eisenhower; Abilene
Elizabeth Elledge; Parsons
Bereniece Geraldine Elliot; Manhattan
Blanche Elliott; Caney
Hildegarde Marie Elsasser; Herington
Delbert Frederick Emery; Parsons
Frederick Earl Emery; Manhattan
Claire Maree Erichsen; Manhattan
Delpha Alice Erickson; Manhattan
Harry Emanuel Erickson; Manhattan
Anna Roxana Erickson; Manhattan
Etna Erickson; Wichita
Harriet Marice Esdon; Garrison
Mary Rebecca Sweany Esdon; Manhattan
Robert Alexander Esdon; Manhattan
Darrell Lee Evans; Manhattan
Ethel Mae Evans; Gallup, N. Mex.
Lucile Marguerite Evans; Manhattan
Ethel Almeda Fansler; Riley
Ernest North Farnham; Abilene
Vern Oren Farnsworth; Topeka
Raymond Phillip Farquhar; Manhattan
Fontella Farr; Waldo
Ruth Marie Faulconer; Manhattan
Goldie Olive Fear; Manhattan
Elwin Elton Feather; Minneapolis
Emma Florea Fecht; Kansas City
Opal Hazel Ferguson; Greensburg
Alta Fields; Manhattan
Eileene Fields; Manhattan
George Albert Filinger; Cuba
Delbert Finney; Topeka
Ronald Dale Finney; Topeka
Alice Fisher; Manhattan
*Roy Fisher; Cabool, Mo.
Jennie LaRue Fisk; Manhattan
James Burger Fitch; Manhattan
Ray Flagg; Manhattan
Willis Harold Flamm; Manhattan
Beattie Hope Fleenor; Manhattan
Bernice May Fleming; Wakefield
Herbert Martin Fletcher; Salina
Carl Edgar Fogleman; Parsons
Kenney Lee Ford; Seneca
Virginia Terlene Forrester; Manhattan
Margaret Lansden Foster; Manhattan
*Silas Foster; Manhattan
Earl Foy; South Haven
Cecile Mildred Francis; Holton
Harvey Dwight Franklin; Horton
Lena Anna Frey; Vassar
Mae Irene Frey; Vassar
Martin Frederick Fritz; Manhattan
Carolyn Ella Fritze; Manhattan
Mary Eleanor Frost; Esbon
Ethel Fuhrken; Washington
Donald Arthur Fulton; Manhattan
Gertrude Fulton; Harper
Winnie Lois Furney; Manhattan
Margaret Ruth Callemore; Arkansas City
Ruth Emma Gardenhire; Alma
*Hugh Alexander Garvie; Abilene
Alice Louise Garvin; Ogden

* Under auspices of the U. S. Veterans' Bureau.

SUMMER SCHOOL—*Continued*

*Bryan William Gaston; Glen Elder
Sam Pete Gatz; McPherson
Bessie Geffert; Manhattan
Harriet Geffert; Manhattan
Leota Marie Gerber; Hanover
Verda Verene German; Glen Elder
Marie Gibson; Independence, Mo.
Emma Marie Gieber; Clifton
Edna Gill; Sylvia
Mabel Josephine Gill; Attica
George William Givin; Manhattan
Louise Phillips Glanton; Manhattan
John Arthur Glaze; Manhattan
Archibald Alexander Glenn, Westmoreland
Frances Elizabeth Godden; Caney
Edith Elizabeth Godwin; Jennings
Agnes Ella Goff; Manhattan
Merle Elmer Goff; Manhattan
*John Calvin Goheen; Clay Center
David Charles Gorham; Garden City
Helen Margaret Gould; Westmoreland
Dymple Elizabeth Graves; Bucklin
Hazel Louise Graves; Manhattan
Clara Belle Gray; Manhattan
Harold Greathouse; Coyville
*Joseph Geer; Pitcairn, Pa.
Donald Bruce Gregg; Stockdale
Edward Maurice Gregg; Frankfort
Paul Wallace Gregory; Manhattan
Charles Clayton Griffin; Nickerson
Josie Margaret Griffith; Manhattan
Thomas Joseph Griffith; Manhattan
Merle Grinstead; Mulvane
LaMotte Grover; Salina
Edith Gabrilla Grundmeier; Barnard
*Harry Ludwig Gui; St. Louis, Mo.
*William Wallace Gunselman; Holton
Mary Sue Haas; Arrington
*Ira Adam Haber; St. George
Ray Hahn; Clay Center
Mary Elizabeth Haise; Russell
Bryant Hale; Hill City
Florence Hall; Mankato
Mildred Josephine Halstead; Manhattan
Jamal Hammad; Palestine
Roland Harvey Hammond; Kansas City
Bethel Vella Hannah; Delavan
Mae Hanscom; Roxbury
*Clarence McKinley Hansan; Manhattan
Iva Viola Hanson; Clyde
Mary Harding; Wakefield
Robert Stanton Hargis; Inman
Lucetta Adeline Harper; Ponca City, Okla.
Marguerite Velma Harper; Ponca City, Okla.
Claude Harris; Manhattan
Florence Harris; Manhattan
Paul Washington Harris; Manhattan
Mary Caroline Harrison; Galena
Louise Harrop; Manhattan
Bernard Cecil Harter; El Dorado
June Nellie Harter; St. John
Lowell Newell Harter; Herington
Richard Michael Hartigan; Manhattan
Fred Hartwell; Goodland
Edith Agnes Hassinger; Manhattan
Louise Susan Hattery; Manhattan
Everett Haukenberry; Manhattan
Theressa Leora Hawke; Clifton
Gladys Hawkins; Tampa
Wilda Marguerite Hay; Eskridge
John Vance Hays; Manhattan
Sarah Elizabeth Head; Clifton
Floyd Chester Healea; Wichita
Bernice Elma Hedge; Manhattan
Vera Doolittle Hedges; Blue Mound
Ashba Varolir Hedges; Whiting
Ida Margaret Hedlind; Clay Center
Edwin Hedstrom; Manhattan
Helen Charlotte Heise; Topeka
Gladys Sophia Heller; Riley
Naomi Mae Hellstern; South Haven
Sue Hemphill; Clay Center
Florence Ethel Henderson; Haddam
*George Elwin Hendrix; Lane
Merle Revere Henre; Kansas City
John Albert Henrich; Whiting
Louise Vera Henry; Belleville
Mabel May Herr; Medicine Lodge
Sherman Adison Herren; Manhattan
Chester Albern Herrick; Manhattan
Earl Howard Herrick; Colony
David Pollock Hervey; Manhattan
Katherine Jane Hess; Manhattan
Cecelia Marie Hesse; St. Marys
Theresa Grace Hesse; St. Marys
Austin Theodore Heywood; Bennington
Bessie Delaurice Hiett; Arma
Harold Herbert Higginbottom; Manhattan
Mary Higinbotham; Manhattan
Beulah Mae Hill; Agenda
Hester Hill; Highland
Inez Margaret Hill; Belleville
Lou Vera Hill; Denison
Verne Clifford Hill; Manhattan
Mildred Fay Hinnen; Potwin
Luvina Hodges; St. George
Ada Mary Hoffine; Washington
Russell Arthur Hoffman; Cherryvale
Mary Lucille Hofmann; Manhattan
Hazel Jaunita Hoke; Manhattan
Vida Marie Holt; Quinton, Okla
Ruth Louise Holton; Manhattan
James Wing Honeywell; Manhattan
Blanche Hooper; Junction City
Earl Fremont Hoover; Alma
*James Ralph Hoover; Manhattan
Max Manley Hoover; Burlingame
Lois Laverne Hosler; Keats
Wilma Irene Hotchkiss; Manhattan
Wayne Raymond Houdyshell; Pawnee Rock
Mignon Corwin House; Manhattan
James Henry Houston; Kanorado
Clara Luella Howard; Manhattan
Dorothy Howard; Garnett
Lester Carlton Howard; Grass Range, Mont.
Hazel Dell Howe; Manhattan
Lois Irene Howe; Keats
Margaret Joyce Howe; Manhattan
Orrin Kem Howe; Adrian, Mo.
Bert Howell; Erie
Helen Harper Howell; Mexico, Mo.
Frances Johanna Hoyt; Junction City
Ruth Geneva Hubbard; Barnes
Helen Julia Huckett; Greenleaf
Charles Bannus Hudson; Fort Scott
Blanche Katherine Huey; Louisville
Serena Louise Huey; Ogden
Katherine Audrey Hugunin; Kirwin
Esther Alden Huling; Manhattan
*Floyd Edgar Hull; Manhattan
Thelma Hull; Mankato
Helen Lois Humphrey; Manhattan
Mae Amelia Humphrey; Manhattan
Wilbur William Humphrey; Manhattan
Adda Hunter; El Dorado
George Dewey Huston; Manhattan
Velma Good Huston; Manhattan
Edwin Charles Hutchings; Manhattan
Ozeta Alice Hutchison; Canton
Emma Hyde; Manhattan
Margaret Hyde; Manhattan
*John Herman Iford; Manhattan
*Carl Grant Iles; Manhattan
*Irwin Ingram; Lawrence

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SUMMER SCHOOL—*Continued*

Marie Insley; Junction City
Hal Francis Irwin; Manhattan
Percy Jennings Isaacson; Walsburg
Mary Ella Iseli; Wakefield
Bernice Georgia Issitt; Navarre
*Thomas King Jackson; Herman, Neb.
Nellie Jacobs; McCune
Lucile Jaedicke; Hanover
*Buel William Jaggar; Parsons
Anna Marie Jahnke; Leonardville
Marion Marguerite Jakabosky; Cuba
Elden Valorius James; Manhattan
Bessie Eileen Jansen; Ottawa
Ramon Quintin Javier; Cadiz, P. I.
Harriett Agnes Jenkins; Kansas City
*Adolph George Jensen; Neodesha
Dora Elizabeth Jensen; Manhattan
Mary Helen Jerard; Manhattan
Beryle La Verne Johnson; Olsburg
Conrad Hastings Johnson; Manhattan
Francis Johnson; Burlington
Helen Wilhelmena Johnson; Burlingame
John Erik Johnson; Gardner
Minnie Florence Johnson; Manhattan
Tracy ElDelle Johnson; Olsburg
*George Frederick Johnston; Topeka
Dorothy Pauline Jones; Blue Rapids
Anna Margaret Jueneman; Hanover
William Harold Jury; Topeka
Della Matilda Justice; Olathe
*Muriel Edgar Kane; Manhattan
George Benjamin Kappelman; Miltonvale
Henry Daniel Karns; Ada
Ralph Marion Karns; Ada
Della Marie Kasper; Narka
Elsie Helen Kastner; Westmoreland
Garnet Elizabeth Kastner; Manhattan
Mabel Florence Kastner; Westmoreland
Alberta Margotmari Kearnes; Auburn, Neb.
Chester Keck; Auburn
Florence John Keetch; Ottawa
Ruth Marion Kell; Manhattan
Alma Gladys Keller; Thomas, Okla.
Edith Louise Keller; Winifred
Edward Guerrant Kelly; Manhattan
Dorothy Alice Kendall; Manhattan
Marion Kendall; Manhattan
Bessie Olive Kennedy; Washington
Jessie Keyes; Manhattan
Marjorie Russell Kimball; Manhattan
Mary Marcene Kimball; Manhattan
Jesse David Kimport; Norton
Inez King; Olsburg
Kathryn Elizabeth King; Manhattan
Lola Mae King; Washington
Venice Marie King; Olsburg
Marion Gibbonney Kirkpatrick; Manhattan
Judith Kjellberg; Vermillion
Phena Ann Klingensmith; Louisville
Regina Verna Klingensmith; Louisville
Ila Thelma Knight; Jamestown
Norma Louise Knoch; Lincoln
Arthur William Knott; Manhattan
James Earl Knox; North Platte, Neb.
Orlena Leona Kohls; Herington
Paul Teddy Kratzmaier; Kansas City
Elsye Mae Kuykendall; Osage City
Mohamed Labib; Barada, Barrage, Egypt
Julia Sirena Lamb; Blue Rapids
Helen Elsie Lang; Cuba
Frank Eugene LaPlant; Delphos
*Smith Herman Lapsley; Manhattan
*Willard Larson; Manhattan
Golda Charlene LaShelle; Manhattan
Donald Earl Lathrop; LaHarpe
Louis Lauriston; Kansas City
Irene Gabrielle Lawrence; Wichita
Verna Meryl Lawrence; Manhattan
William Grant Lay; Topeka
Amy Jane Leazenby; Manhattan
Marvel Ruth Lee; Keats
Mildred Inette Leech; Fredonia
Lavina Leibengood; Lawrence
Ingovar Leighton; West Helena, Ark.
LeRoy Markle Leiter; Protection
*John Clyde Lentz; Holton
Carrie Lewis; Clyde
Clarence Flavius Lewis; Manhattan
Edith Blanche Lewis; Belleville
*Reece Lewis; Emporia
Maurice Lillis; Kansas City
Ruth Agnes Limbocker; Manhattan
Vera May Limbocker; Manhattan
Carl Lindgren; Smolan
Vera Ingeborg Lindholm; Falun
Shepard Keene Linscott; Farmington
Mary Elizabeth Linton; Denison
Fred Wallace Lipps; Abilene
Mack Little; Fowler
Earl Milo Litwiller; Manhattan
Carl Walter Londerholm; Manhattan
Hazel Joy Longabaugh; Halifax
Herbert Melvin Low; Topeka
Frances Georgia Lowe; Manhattan
John Lowe; Tronsdale
Ada Katharine Lush; Altamont
Hazel Alma Lyness; Walnut
Etna Lyon; Manhattan
Eugene Sidney Lyons; Manhattan
Eleanor Margaret McAtee; Waterville
Alice Lula McCammon; Mankato
Iris Althea McCargar; Fostoria
Mabel McComb; Wichita
Nelle Rebecca McComb; Topeka
Hazel Bea McConnell; Russell
Henry Landon McCord; Manhattan
Wilma Irene McCord; Manhattan
Roy McCoy; Kansas City
Rose Margaret McCoy; Wamego
Cecile Muriel McCracken; Cuba
Zella McCue; Mound Valley
Lois Emily McCulley; Clay Center
Agnes McDonald; Manhattan
Helen Margaret McDonald; Manhattan
James Leroy McEachern; Girard
Howard Hutcheson McGee; Olathe
John Oliver McIlwaine; Salina
Ralph Waldo McIlwain; Hoisington
Roswell James McIntosh; Manhattan
Mark James McKeeman; Manhattan
Ada Marie McKeever; Holton
Lucille Myrtle McKenzie; Wayne
Florence McKinney; Great Bend
Mary Ellen McLeod; Vermillion
William Max McLeod; Manhattan
*George Roy McMahon; Manhattan
Daisy McMullen; Norton
Elfie Leola McMullen; Norton
Mary Louise McNiff; Manhattan
*Earl Harper McQuiston; Greenwich
Alice Catherine McTaggart; Vinland
Martha Davis MacElvaine; Manhattan
Robert Capps MacElvaine; Manhattan
Freda Marine Mack; Clay Center
Reuben Cleo Maddy; Utica
Alice Gertrude Magee; Manhattan
Pearl Mahaffey; Erie
Marie Louise Maloney; Chapman
George Edwin Manzer; Manhattan
Frances Emily Mardis; Preston
Daniel Claire Marshall; Manhattan
Elma Lois Marshall; Leon
Anna May Martin; Clifton

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SUMMER SCHOOL—*Continued*

Claire Martin; Herington
Florence Merle Martin; Cuba
Flossie Pearl Martin; Cuba
Isaac Martin; Medicine Lodge
Paul Gordon Martin; Manhattan
Ruth Martin; Hiawatha
William Redmond Martin; Manhattan
Viola Mattie Martinitz; Chapman
Geneva Angelia Maskil; Wheaton
Lola Lorraine Matter; Manhattan
Dwight Lowry Maxwell; Ottawa
Hazel Irene May; Manhattan
Virginia Marion Mayfield; Manhattan
Virginia Messenger; Manhattan
Elda Lillian Meyer; Manhattan
Florence Mable Meyer; Washington
Mildred LaVina Michener; Mulvane
Andrew John Miller; Manhattan
Fay Clarke Miller; Ames
Pearl May Miller; Garden City
Pierre Alphonse Miller; Manhattan
Victor Henry Miller; Pawnee Rock
Florence Irene Mirick; Halstead
Mildred Agnes Mitchell; Republic
*Thomas Adolphus Mitchell; Manhattan
*William Elmer Mitchell; Manhattan
Georgia Moe; Osage
Lyla Elfie Moline; Randolph
Harriett Eloise Monroe; Manhattan
Sarah Idabelle Monroe; Manhattan
Cecil Moore; Manhattan
Cecil X. Moore; Manhattan
*Leo Albert Moore; Manhattan
Nellie Dale Moore; Protection
Robert Moore; Manhattan
Rosann Margaret Moore; Clay Center
Ruth Moore; Abilene
James Richard Moreland; Formoso
William Nathaniel Moreland; Formoso
Mary Hope Morris; Manhattan
Paul Reddick Morris; Paxico
Ruth Dorothy Morris; Clifton
Rael Fisher Morris; Oswego
Fern Mary Morrissette; Clyde
*Coy Ellis Morrison; Gibbon, Neb.
Doris Ethel Mortimer; Manhattan
Mary Anna Morton; Bigelow
Fred Roy Mouck; Liberal
Harry Forest Moxley; Osage City
George Vernon Mueller; Sawyer
Gladys Muilinburg; Palco
Helen Mae-Mullarky; Glasco
Iva Manilla Mullen; Labette
*Cyrus Ben Mulley; Scotia, Cal.
Jonathan Alexander Munro; Manhattan
Diantha Murdock; Manhattan
Hannah Bridget Murphy; Perth
Edith Virginia Muse; McPherson
Alice Marie Musil; Irving
Marie Sara Muxlow; Manhattan
Bernice Eola Myers; Manhattan
Channing George Myers; Manhattan
Frank Lewis Myers; Manhattan
*Richard Brenton Myers; Great Bend
Walter Emory Myers; Eskridge
Marie Emma Nanninga; Leonardville
Leonard George Nehring; Alma
Mildred Neilson; Concordia
Arvid Nelson; Atwood
Dorothy Leona Nelson; Manhattan
Ethel Mae Nelson; Tecumseh
Mabel Caroline Nelson; Clifton
Pearle Louise Nelson; Atwood
Williams Anthony Nelson; Dwight
*Francis Joseph Nettleton; Lenora
Ruth Nettleton; Lenora
Karl William Nieman; Manhattan
Charles Nitcher; Manhattan
Bernice Rae Noble; Manhattan
Evelyn Marie Noll; Manhattan
Linus Noll; Louisville
Edith Berenice Nonken; Manhattan
Edith Marie Norris; Whitewater
Mary Norrish; Manhattan
Vernon Martin Norrish; Manhattan
Margaret Northern; Greensburg
Helen Grosvenor Norton; Chanute
Ivy Beatrice Nudson; Topeka
Mary Esther Nuttle; El Dorado
Pauline Harriette Nylund; Scandia
Esther Oakes; Manhattan
*Wilmer Lee Oakes; Manhattan
*Jacob Oblander; Manhattan
Bernice Ruth O'Brien; Manhattan
Bertha Ruby O'Brien; Manhattan
Zoe O'Leary; Phillipsburg
Ethyle Lenore Oliver; Manhattan
*Floyd Robert Oliver; Manhattan
Emma Christine Olson; Everest
Hazel Venëta Olson; Clyde
Letha Bernice Olson; Oakley
Louise Adeline O'Malley; Riley
Ralph Vernon O'Neil; Wellsville
Elver Wayne Osbourn; May Day
Velma Parker; Manhattan
Leota Grace Parnell; Haddam
Adah Elizabeth Patterson; Clifton
Agnes Patterson; Manhattan
Alice Patterson; Manhattan
Robert Thomas Patterson; Ellsworth
Clara Margaret Paustian; Sterling, Neb.
Loyal Frederick Payne; Manhattan
Zenia Pearson; Manhattan
Clara Cordelia Pennell; Junction City
Reuben Trapper Periman; Whitewater
Robert Perkins; Oswego
Lawrence Todd Perrill; Dorrance
*Everett Allen Peterson; Manhattan
Maurine Peterson; Manhattan
Alma Petrasek; Jennings
Helen Leola Phillips; Manhattan
Margaret Frances Pickett; Galena
Gladys Angeline Pierce; Manhattan
Peter Piper; Manhattan
Ira Lewis Plank; Winfield
Lester Boyd Pollom; Topeka
Bertha Emily Pommerenke; Clay Center
*Armer Porter; Manhattan
Clarence Osborn Price; Manhattan
Irene Mae Pride; Paxico
Carrie Elizabeth Pugh; Kansas City
Eva Pugh; Ellis
Frank Hoyt Purcell, Jr.; Manhattan
Leslie Ray Putnam; Manhattan
Elizabeth Quail; Topeka
Marion Quinlan; Manhattan
Addie Alice Radebaugh; Frankfort
Simeon Baniaga Rambac; Salano, P. I.
Joseph Earl Rankin; Mound City
William Rankin; Manhattan
Ezra Guy Rasmussen; Cleburne
*Benjamin Dawson Rawie; Stanley
Clara Burton Raymond; Bigelow
Sara Raymond; Bigelow
Elwood Effeayer Reber; Hiawatha
Edith Viola Reece; Riley
Edna Agnes Reed; Kingman
Harry Reed; Manhattan
Hervey Omer Reed; Cassoday
Virginia Louise Reeder; Troy

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SUMMER SCHOOL—*Continued*

Victor Reef; Merriam
John Walter Reel; Manhattan
LaNora Ellen Regnier; Wamego
Mae Rose Reichart; Valley Falls
*George Ambrose Reid; Manhattan
Irene Ida Reiner; Manhattan
Mabel Beatrice Reitzel; Waterville
Agnes Jeanette Remick; Manhattan
Anna Hilkea Remmers; Riley
Kenneth Miller Renner; Manhattan
Howard Albert Rennick; Mulvane
Harold Rhine; Manhattan
Mable Rhine; Manhattan
Genevieve Catherine Riat; Belvue
Dorothy Ada Rice; Delavan
Lewis Jones Richards; Manhattan
Lois Thomas Richards; Manhattan
Mary Ferne Richards; Manhattan
Velma Elizabeth Roark; St. Joseph, Mo.
Mary Eilleen Roberts; Kirwin
Helen Roberts; Kirwin
Frances Robinson; Hays
Margaret Teresa Rochford; Osborne
Adelen Anna Roebke; Clifton
Arthur Lincoln Rogers; Manhattan
Charles Elkins Rogers; Manhattan
Samuel Nicholas Rogers; Manhattan
*Norvel Delany Rollins; Manhattan
*Michael Romey; Manhattan
Edna Mae Romick; Valencia
*Frank Root; Manhattan
Mayetta Roper; Barnes
Goldie Clarinda Rose; Leonardville
Herbert Rose; Waldron
Evelyn Alberta Rosell; Keats
Inga Anna Ross; Amarillo, Texas
Victoria Frances Rost; Belleville
Kenneth Virgil Rowe; Glen Elder
Mary Alice Rowe; Manhattan
*Morris Emory Rowe; Winfield
William Hobson Rowe; Manhattan
Mabel Ruth Rubart; Milford
Glenn Rucker; Burdett
Gretchen Rugh; Topeka
Kathryn Elizabeth Rumold; Manhattan
Dora Ferne Russell; Manhattan
Laura Faye Russell; Manhattan
Lenora Russell; Manhattan
Nina Russell; Manhattan
Orpha Eilleen Russell; Manhattan
Paul Wilfred Russell; Jewell City
John Howard Rust; Manhattan
Lucile Osborn Rust; Altamont
Jennie Marie Ryan; Chapman
Lillian Sands; Kansas City
Ford Sangster; Kanopolis
Charles Richard Sattgast; Moscow
James Fred Savage; Wright
Anna Augusta Saville; Blue Rapids
Paul Baldwin Sawin; Buffalo, N. Y.
*Glen Ransom Sawyer; Manhattan
Cornelia Margaretha Schaaf; Hope
Raymond Ralph Schad; Abilene
Edna Eleanor Schane; Onaga
Christian William Schemm; Wakeeney
Isabell Dorothy Schmelzle; Westmoreland
Marjorie Lenore Schmidler; Manhattan
Helen Gretchen Schneider; Manhattan
Lucretia Scholer; Milo
Everett Morrill Schreck; Garrison
Grace Schultz; Manhattan
Herbert Henry Schwardt; Iola
Bernice Adaline Scott; Greenleaf
Emma Katherine Scott; Kirwin
Mabel Scott; Westmoreland
Olivette Scritchfield; St. George
Richards Maurice Sears; Eureka
Elnora Wanamaker Seaton; Manhattan
Emily Rose Sedivy; Irving
Aurelia Amelia Seeberger; Hanover
Alma Seematter; Marysville
Hilda Anna Seitz; Hollenberg
Grace Margaret Selden; Bigelow
Thelma Henrietta Sexton; Republic
Clara Iola Shaw; Wamego
Marybelle Sheetz; Chillicothe, Mo.
Byron LeRoy Shepherd; Burlingame
Roger Turner Shepherd; Burlingame
Francis Marlin Sherwood; Grenola
Christiana Marie Shields; Lost Springs
William Frederick Shorman; Clay Center
Wesley Earl Simpson; Wilda
Bahindar Singh; Shahkoat, Punjab, India
Sister M. Frances Costello; Manhattan
Sister Mary Nicholas Arnoldy; Manhattan
Sister Mary Adolphus Maloney; Junction City
Sister M. Euphrasia Barth; Concordia
Sister Stanislaus Kelly; Manhattan
Sister M. Rosina Nolan; Concordia
Sister M. Purificata O'Connell; Manhattan
Sister M. Gertrude Selting; Manhattan
Sister Mary Grace Waring; Salina
Lois Sitterley; Manhattan
*Orval Marion Sloan; Thayer
Myrna Maude Smale; Manhattan
Aubrey Charles Smart; Manhattan
Claramary Smith; Mound City, Mo.
Doris Jane Smith; Burlingame
Edwin Lee Smith; Manhattan
Hester Elizabeth Smith; Manhattan
Louis Harrison Smith; Lebo
Neill Soren Smith; Miltonvale
Raymond Edward Smith; Manhattan
Robert Burns Smith; Brilliant, N. M.
Salome Margaret Smith; Miltonvale
Stephen Ray Smith; Beloit
Bertha Snyder; Winfield
Charles Edward Snyder; Soldier
Neva May Solt; Waterville
Novelle Somerville; Manhattan
*Fred Sowers; Dunlap
Clyde DeWitt Spangler; Junction City
Vera Katherine Spears; Garnett
Dorothy DeWolf Spindler; Garnett
Lloyd Ancil Spindler; Garnett
Clyde Leslie Spring; Manhattan
Rachel Stein; Smith Center
*Charles Stephens; Manhattan
Frank Eugene Sterba; Belleville
Rachel McCune Steuart; Winchester
Howard Harold Steup; Manhattan
Anna Caroline Stewart; Morganville
Edna Stewart; Morganville
Elma Ruth Stewart; Topeka
George Stewart; Morganville
Margaret LaVon Stewart; Wamego
Mary Anne Stewart; Abilene
Ruth Stewart; Manhattan
Ferol Avalon Stickel; Manhattan
Gilbert Adelbert Stiles; Attica
Glenn Verl Stitt; Garden City
Mae Evelyn Stoneberg; Manhattan
Alice Evelyn Stoner; Vesper
Raymond Luther Stover; Manhattan
Clark Oliver Stratford; El Dorado
Carol Lusetta Stratton; Manhattan
Charles William Stratton; Manhattan
Euphemia Faith Strayer; Lawrence
Genevieve Stricklin; Liberal
Richard Raymond Stucky; Manhattan
Mae Rachel Sullivan; Logan
Homer Lewis Summers; Manhattan
Clarina May Summers; Ogden
Estel Sumner; White City
Lauretta Victoria Sumners; Ogden
Zaven Karapet Surmelian;
Constantinople, Turkey

* Under auspices of the U. S. Veterans' Bureau.

SUMMER SCHOOL—*Concluded*

Mae Myrtle Surprenant; Clifton
Gladys Leona Sutterlin; Westmoreland
John Floyd Sutterlin; Westmoreland
Pearl Pauline Sutton; Blue Rapids
*Paul John Swanson; Topeka
*Joseph Frank Swarner; Manhattan
Milan Burdette Swartz; Hiawatha
*Zephyr Koble Sweetland; Valley Center
Floyd Raymond Swim; Newton
Harry Alcid Swim; Manhattan
Gladys Eola Swinton; Beloit
Viola Lucy Tague; Hutchinson
Bernice Lolelia Tallcott; Hollenberg
Lois Beryl Tallcott; Hollenberg
Clarence John Tangerman; Newton
Miriam Grace Tannehill; Broughton
Earl Alphonso Taylor; Kansas City
Lewis Walter Taylor; Manhattan
Harley Albert Teall; Manhattan
William Teas; Manhattan
Maude Tellis; Keats
Harold Hetherington Theiss; Hutchinson
Lawrence Clifford Thomas; Clay Center
Arch Thompson; Harper
Clarence Edward Thornburgh; Miller
Dessie Olive Thornburgh; Manhattan
Lucille Constance Thornburgh; Dodge City
Mildred Bertha Thurow; Macksville
Nellie Mae Tibbetts; Blaine
Rolla Williams Titus; Manhattan
Srboljub Rad Todorovic; Kragujevac, Serbia
*Chester Tolle; Manhattan
Lorretta Mary Torrey; St. George
Chloe Annette Tracy; Manhattan
Esther Irene Tracy; Manhattan
Genevieve Thelma Tracy; Manhattan
Marie Anna Tracy; Manhattan
Sarah Elizabeth Tracy; Manhattan
Opal Maye Trout; Eskridge
Florence Ellen True; Perry
Anna Jean Unruh; Pawnee Rock
Manuel Valdes; Santiago, Chile
Gladys Myrna Van Blaricom; Clifton
Hobart Scott Van Blarcom; Manhattan
Charles Elijah Vance; Garden City
Winifred Grace Vanderwilt; Solomon
Helen Margaret Van Gilder; Manhattan
Leland Stanford Van Scoyoc; Manhattan
John Waldo Van Vleit; Manhattan
*Virgil Van Vermillion; Manhattan
Rose Mary Vesely; Blue Rapids
Helena Mary Viers; Manhattan
Zenobia Lenore Vilander; Cleburne
Lola Beatrice Vincent; Amarillo, Tex.
Ferdinand Voiland; Topeka
Mildred Margaret Wagner; Clyde
Adelia Lavone Walker; Manhattan
Diantha Walker; Manhattan
Gladys Irene Walker; Junction City
Ida Jane Walker; Manhattan
Lewis Earl Walker; Garden City
Niles Hamilton Walker; Winfield
Joe Chadwick Wallace; White City
Goldie Lucille Walt; Gove
Edna Bell Walters; Vining
William Glen Walton; Topeka
Wirt Dudley Walton; Leavenworth
Earl Dawson Ward; Elmdale
Ferne Argie Ward; Solomon
Logan Byron Warlick; Manhattan
Vera Wasson; Neosho
Colletta Mayden Waters; Manhattan
Eugene Albertice Waters; Wellsville
Rolland Hays Waters; Manhattan
Emory Newton Watkins; Manhattan
Wilbur Ellis Watkins; Ottawa
*James Watson; Shannon
Mary Louise Watson; Shreveport, La.
Raymond Howard Watson; Kansas City, Mo.
Arthur Weber; Manhattan
Dorothy Grace Webber; Riley
*Fred Webster; Mayetta
Clarissa Jane Weeks; Manhattan
*Everett John Weeks; Manhattan
Harry Richard Wege; Great Bend
Lloyd Sherman Weikal; El Dorado
Abigail Katherine Welker; Coffeyville
Florence Geneva Wells; Meriden
James Ralph Wells; Manhattan
Janet Wells; Belleville
Leonice Pearl Wells; Meriden
Ruth Elizabeth Welton; Fairview
Albert Parken Wertman; Washington
DeWitt Clinton West; Lawrence
Verda Viola Weyer; Manhattan
Mabel Ellen Whearty; Westmoreland
Harold Parker Wheeler; Manhattan
Florence Rilla Whipple; Manhattan
Nana Frances Whitman; Kansas City
Delta Nadine Whitmore; Manhattan
Frances Josephine Whitmire; West Plains, Mo.
Wayne Clark Whitney; St. George
Henry Evert Wichers; Downs
Virgiline Lucile Wieman; Topeka
Helena Gertrude Wilber; Belleville
Mary Lillian Wilber; Belleville
Mary Edith Wilkins; Kansas City
John Camp Wilkins; Kansas City
*Archie Clay Williams; Siloam Springs, Ark.
Fred Woods Williams; Manhattan
John Rosenquist Williams; Emporia
Juanita Marie Williams; Guthrie, Okla.
Louis Coleman Williams; Manhattan
Maude Williamson; Manhattan
Oral Martin Williamson; Kansas City
*Randolph Williamson; Emporia
Bertha Belle Willis; Washington
Nina Katherine Wills; Narka
Cecil Cline Wilson; Manhattan
*Glenn Wilson; Neodesha
Karl Marx Wilson; Concordia
Mary Kinnis Wilson; Warrensburg, Mo.
Mavis Wilson; Manhattan
Otis Harold Wilson; Jennings
*Claude Winterscheid; Gridley
Paul Raymond Wise; Clearwater
*Walter Wisnicky; Green Bay, Wis.
Lois Emily Witham; Norcatur
Lornee Janie Wolfe; Johnson
Robert Wallace Womer; Manhattan
Roscoe Daniel Womer; Manhattan
Ruth Aileen Wonnell; Le Roy
Chester Stanley Wood; Manhattan
Glenn Ivan Wood; Milan
Lawrence Ewalt Woodman; Manhattan
Genevieve Marguerite Woodruff; Manhattan
Charlotte Woolley; Blue Rapids
Gracelee Woolverton; Abilene
Mary Abbie Worcester; Manhattan
Mabel Lucile Worster; Manhattan
Frances Maurine Wright; Concordia
Henry Amos Wright; Welsh, La.
William Wheeler Wylie; Manhattan
Mabel Faye Yapp; Jewell
*Rochford Glenn Yapp; Manhattan
Zella Ann Yaussi; Marysville
Clela Gwendolyn Yeager; Scandia
Jacob Henry Yoder; McPherson
Clara Bryan Yowell; Osage City
Lian Woo Yu; Shantung, China
Iscah Marian Zahm; Wetmore
Helen Alice Zeidler; Manhattan
Ruth Esther Zeigler; Abilene
Amanda Alberta Zernickow; Junction City
Katherine Pheobe Zipse; Jewell
June Zirkle; Berryton
Clara Cecelia Zumbahlen; Hanover

* Under auspices of the U. S. Veterans' Bureau.

## STUDENTS IN SPECIAL COURSES

The abbreviations following the names of students have the following significations: AMSC, automobile mechanics' short course; BSC, blacksmiths' 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; NGA, nongraded; TOSC, tractor operators' short course; VS, Vocational School.

Mary Alexa (HSC); Washington
Elizabeth Allison (HSC); Manhattan
Albin Clarence Anderson (TOSC); Lindsborg
Orem Anderson (AMSC); Huron
†Ira Ralph Angell (ETC); Portis
Rolland Paul Baillod (VS); Emporia
Fred Barre (ESC); Tampa
Marshall Henry Beahm (CCSC); Smith Center
Henry Eldon Beck (FSC); Riley
Paul Becker (FSC); White City
Oscar Alvin Beichter (AMSC); Broughton
William Spurgeon Biegert (FSC); Junction City
Arvid Bjork (BSC); Levant
George Robert Boyd (ETC); Munden
Ada Pearl Bradley (VS); Wabaunsee
Audrey Paul Brenner (FSC); Waterville
Emery Otis Brown (FSC); Great Bend
Lawrence Vernon Brown (AMSC 1; FSC 2); Great Bend
Earle Holmes Bucknell (ESC); Kansas City, Mo.
Halley Bulthaup (TOSC); Glen Elder
Leo Cade (CCSC); Shawnee, Okla.
Kenneth Calglazier (FSC); Larned
*Owen Callahan (NGA); Morehead
*Dave Cardwell (NGA); St. Joseph, Mo.
*Harry Edwin Carrier (NGA); Topeka
James Parker Caster (CCSC); Manhattan
*Ralph Collins (NGA); Marysville
Roy Lee Compton (FSC); Larned
William Ruben Cook (FSC); Dodge City
Charles Edgar Copeland (FSC); Waterville
Victor Louis Crumley (ETC); Fredonia
Louis James Cunnea (FSC); Plains
Kenneth Lee Daniels (ESC); La Harpe
Paul Dewees (WFTSC); Kansas City, Mo.
Vernon Davison (FSC); Michigan Valley
Austin Young Diehl (FSC); Enterprise
Joe Allison Diehl (FSC); Enterprise
*George Joseph Dooley (NGA); Haysville
James Phillip Douglass (ETC); Marysville
Leslie Dudey (ETC); Conway Springs
Fletcher Elias Eberly (WFTSC); Chadron, Neb.
Raymond Eckelman (FSC); Lincoln
Paul Fredrick Eikmeier (BSC); Garfield
Harold Ekdahl (ETC); Manhattan
Samuel Preston Ervin (AMSC); Emporia
Julius Fankhauser (FSC); Madison
John Gilbert Fisher (CCSC); Lincolnville
Karl Fisher (FSC); Strong City
*Roy Fisher (NGA); Cabool, Mo.
*Silas Foster (NGA); Emporia
Frank Hubert Frohn (FSC); White City
Carl Elsworth Gardner (VS); Smith Center
Jewell Floyd Gardner (FSC); Smith Center
Ralph Thomas Gardiner (CCSC); Bucklin
*Bryan William Gaston (NGA); Glen Elder
Carl Wilhelm Gerriets, Jr. (BSC); Clay Center
Henry Glahn (FSC); Carlton
Norman Edgar Graham (FSC); Sabetha
*Rush John Greene (NGA); Nickerson
Fred Christ Grieshaber (TOSC); St. Marys
Lloyd Dan Grubb (FSC); Netawaka
Frank Lloyd Gurtler (TOSC); Beattie
*Ira Adam Haber (NGA); St. George
George Maelzer Haise (ETC); Manhattan
*Clarence McKinley Hanson (NGA); Clyde
Walter Lloyd Hanson (TOSC); Morganville
Fred Hartwell (VS); Goodland
George Edward Hedges (CCSC); Leavenworth
Harry Heine (TOSC); Belvue
Nora Augusta Herrman (HSC); Winkler
Lillian Verna Heusi (HSC); White Cloud
Lloyd Higbee (FSC); Goddard
David Hilbert (WFTSC); Buhler
Harvey Merl Hill (FSC); Hope
Robert Hunter Hobson (AMSC); Talbert, Tex.
Lawrence James Hoover (FSC); Junction City
Alvin Jackson Howell (CCSC) Ottawa
Alvin Rowland Howell (FSC); Garfield
Robert Emil Hurley (ESC); Topeka
William Cecil Hutchinson (TOSC); Delavan
*John Herman Iford (NGA); Pratt
*Thomas Jackson (NGA); Herman, Neb.
*Buel William Jaggar (NGA); Parsons
Charles Janney (CCSC); Alamosa, Colo.
William Paul Jantz (CSC); Larned
Charles Victor Johnson (FSC); Helper, Utah
Ernest Henry Jones (AMSC); Manhattan
Lyle Jones (ESC); Frankfort
William Andrew Juergensen (FSC); Great Bend
John Theodore Kachelman (TOSC); St. John
*Muriel Edgar Kane (NGA); La Harpe
Clarence Edward Knight (ESC); Lyons
Flora Marie Koelliker (HSC); Robinson
Leon Harold Krause (AMSC); Council Grove
Albert Kruger (FSC); Plymouth, Neb.
Emmor Lawton (AMSC); Manhattan
Anna Elizabeth Lind (HSC); Robinson
Perry Lohse (BSC); Waterville
Hermon Lueers (FSC); Marysville
*James Corwin Lusk (NGA); Olivet
May McBurney (HSC); Manhattan
*Earl Harper McQuiston (NGA); Greenwich
John David Markley (CCSC); Mound City
Otto Ernest Marsh (ETC); Fort Scott
LaVerne Valentine Marty (CCSC); Courtland
Dot Masterson (FSC); Riley
Mabel Elsie Matoush (HSC); Holyrood
Louis Joseph Meier (FSC); Kingman
*Thomas Franklin Merrill (NGA); Douglas
*William Elmer Mitchell (NGA); Topeka
*Coy Ellis Morrison (NGA); Gibbon, Neb.
Clyde Meryn Mount (VS); Manhattan
Harold Daniel Myers (CCSC); Alamosa, Colo.
*Richard Brenton Myers (NGA); Mentor
Hannah Martha Nelson (HSC); Manhattan
Esther Marie Nevius (HSC); Paola
Samuel Lee Nevins (FSC); Spring Hill
*Jacob Oblander (NGA); Marion
Severt Olson (CSC); Clyde
Joseph Alfred O'Neal (FSC); Manhattan

* Under auspices of the U. S. Veterans' Bureau.
† Deceased.

STUDENTS IN SPECIAL COURSES—*Concluded*

Amos Harold Ott (FSC); Madison
Lynn Blum Patton (FSC); Garnett
*Raymond Alex Pearson (NGA); Ottawa
Carl Peterson (BSC); Waterville
*Everett Allen Peterson (NGA); Admire
Cyrus Binford Pike (FSC); Goddard
Ernest Lee Pitman (FSC); Minneola
Audley Porter (FSC); Merriam
Robert Porter (WFTSC); Delta, Colo.
Evert Pound (TOSC); Greensburg.
Cecil Price (FSC); Atlanta
Wilbur Alonzo Pritchard (FSC); Dunlap
Ervin Pronske (BSC); Waterville
*Benjamin Dawson Rowie (NGA); Stanley
Crissie Admirl Read (AMSC); Alta Vista
Alfred Theodore Rezak (FSC); St. Marys
Matthew Martin Rezak (FSC); Emmett
Bertha Helen Richert (HSC); Moundridge
Leonard LaRue Ritz (FSC); Cawker City
*Norvel Rollins (NGA); Ness City
*Michael Romey (NGA); Victoria
Ruth Elizabeth Rosencutter (HSC); Manhattan
Roland Rufeld (WFTSC); Great Bend
Leo Sack (AMSC); Hays
John Salchow (MSC); Junction City
Arthur Samuelson (TOSC); Frankfort
Anton Lincoln Schmidt (FSC); Newton
Roy Robert Schowalter (CSC); Moundridge
Kurt Paul Schumann (FSC); Netawaka
Clyde Morris Scott (AMSC); Westmoreland
Walter Simon Scott (VS); Kansas City
James Merton Shaw (AMSC); Kansas City
Alton Cole Sheley (CCSC); Norton
Clarence Beryl Sherman (AMSC); Neal
Harry Smethurst (FSC); Manhattan
Lawrence Ralph Smith (FSC); Council Grove
Louis Phillip Smith (ETC); Carthage, Mo.
*Fred Sowers (NGA); Dunlap
*Charles Stephens (NGA); Wheaton
David Ray Stewart (VS); Wamego
Richard William Stumbo (VS); Iola
Valentine Carl Stutz (TOSC); Manhattan
Alfred Suelter (FSC); Lincoln
Leona Odessa Supernaugh (VS); Newton
*Paul Johnson Swanson (NGA); Miller
Theodore Thomas Swenson (CCSC); Lindsborg
*Zepher Kable Sweetland (NGA); Valley Center
Norman Lynn Thompson (AMSC); Cambridge
Ruth Tinkham (VS); Denver, Colo.
Franklin Benjamin Tobouren (TOSC); Cleburne
Lucille Adella Uhlrig (VS); Belvue
Eddie Vanek (MSC); Garrison
Grace Van Loenen (HSC); Prairie View
Vollie Mae Vassar (HSC); Tecumseh, Okla.
*Virgil Van Vermillion (NGA); Yates Center
*James Mathew Watson (NGA); Shannon
Lauren Edger Watters (FSC); Marysville
*Fred Webster (NGA); Mayetta
Everett Erle Weinhold (AMSC); Wilson
Richard Clinton Wells (VS); Manhattan
Jacob Joseph Weinman (CCSC); Olpe
Benjamin Luty Williamson (FSC); Troy
*Randolph Williamson (NGA); Emporia
Ross Albert Willis (ETC); Manhattan
William Paul Winslow (FSC); Dalton
Claude Arb Wonderlick (FSC); Bloomington
Benjamin Franklin Woodward (TOSC); Burrton
George Walter Wooley (FSC); Osborne
Lambert Henderson Young (FSC); Morrowville

* Under auspices of the U. S. Veterans' Bureau.

## Summary of Attendance, 1924-'25

| | Agriculture | | Veterinary medicine | | Agricultural engineering | | Architecture | | Architectural engineering | | Chemical engineering | | Civil engineering | | Electrical engineering | | Flour-mill engineering | | Landscape architecture | | Mechanical engineering | | Engineering, miscellaneous | | Home economics | | General science | | Rural commerce | | Industrial journalism | | Music | | Industrial chemistry | | Total | | | Grand total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M. | | M. | | M. | | M. | | M. | | M. | | M. | | M. | | M | | M. | | M. | | M. | | W. | | M. | W. | M. | W. | M. | W. | M. | W. | M. | | W. | Total. |
| Senior | 61 | | 15 | | 8 | | 3 | | 2 | | .... | | 24 | | 30 | | 2 | | .... | | 14 | | .... | | 74 | | 31 | 34 | 18 | 3 | 13 | 8 | .... | 4 | 3 | 224 | | 123 | 347 |
| Junior | *60 | | 11 | | 5 | | 9 | | .... | | 3 | | 33 | | 69 | | .... | | 1 | | 27 | | .... | | 104 | | 35 | 36 | 37 | 1 | 4 | 14 | 2 | 12 | 4 | 299 | | 168 | 467 |
| Sophomore | *78 | | 13 | | 9 | | 18 | | .... | | 6 | | 46 | | 98 | | 3 | | 2 | | 24 | | .... | | 119 | | 55 | 38 | 62 | 9 | 17 | 29 | 2 | 42 | 9 | 441 | | 238 | 679 |
| Freshman | *168 | | 24 | | 10 | | *45 | | .... | | 17 | | 83 | | 191 | | 8 | | 6 | | 57 | | .... | | 222 | | 146 | 89 | 147 | 16 | 49 | 37 | 5 | 60 | 11 | 965 | | 426 | 1,391 |
| Special | 26 | | .... | | .... | | 2 | | .... | | .... | | 1 | | 4 | | .... | | .... | | .... | | .... | | 14 | | 55 | 37 | .... | .... | .... | .... | .... | .... | .... | 88 | | 51 | 139 |
| Graduate | **49 | | 9 | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | †33 | | 24 | | 50 | 20 | .... | .... | .... | .... | .... | .... | .... | 138 | | 47 | 185 |
| Vocational School | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 8 | | 4 | 12 |
| Nongraded Agriculture | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 35 | | ..... | 35 |
| Machinists' Trade Course | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | 5 | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 5 | | ..... | 5 |
| Carpentry Trade Course | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | 2 | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 | | ..... | 2 |
| Blacksmithing Trade Course | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | 1 | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | | ..... | 1 |
| Auto Mechanics' Trade Course | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | 2 | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 | | ..... | 2 |
| Short Courses: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tractor Operation | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | 13 | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 13 | | ..... | 13 |
| Automobile Repair | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | 9 | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 9 | | ..... | 9 |
| Electrical Repair | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | 6 | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 6 | | ..... | 6 |
| Blacksmithing | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | 6 | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 6 | | ..... | 6 |
| Automobile Operation | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | 5 | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 5 | | ..... | 5 |
| Carpentry | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | 3 | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 3 | | ..... | 3 |
| Machine Shop | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | 2 | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 | | ..... | 2 |
| Farmers' | *55 | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 54 | | 1 | 55 |
| Commercial Creamery | 14 | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 14 | | ..... | 14 |
| Wheat and Flour Testing | 5 | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 5 | | ..... | 5 |
| Housekeepers' | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | 14 | | .... | .... | .... | .... | .... | .... | .... | .... | .... | ..... | | 14 | 14 |
| Summer School (1924) | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 460 | | 660 | 1,120 |
| Totals | ‡516 | | 72 | | 32 | | *77 | | 2 | | 26 | | 187 | | 392 | | 13 | | 9 | | 122 | | †87 | | 571 | | 372 | 254 | 264 | 29 | 83 | 88 | 9 | 118 | 27 | 2,785 | | 1,732 | 4,517 |
| Counted twice | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 296 | | 190 | 486 |
| Net totals | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2,489 | | 1,542 | 4,031 |

* One woman. † Two women. ‡ Five women.

The above figures include seventy-five men and one woman who are under the auspices of the United States War Veterans' Bureau.

## Students by States and Counties

| | | | | | |
|---|---|---|---|---|---|
| Arizona | 1 | Kentucky | 1 | Pennsylvania | 1 |
| Arkansas | 3 | Louisiana | 5 | South Dakota | 6 |
| California | 6 | Minnesota | 3 | Texas | 13 |
| Colorado | 16 | Missouri | 85 | Utah | 1 |
| District of Columbia | 2 | Montana | 4 | Washington | 1 |
| Idaho | 1 | Nebraska | 23 | Wisconsin | 2 |
| Illinois | 4 | New Jersey | 1 | Wyoming | 2 |
| Indiana | 3 | New Mexico | 5 | | |
| Iowa | 4 | Ohio | 5 | Total | 4,003 |
| Kansas | 3,757 | Oklahoma | 48 | | |

FOREIGN COUNTRIES.

| | | | | | |
|---|---|---|---|---|---|
| Argentina | 2 | Colombia | 1 | Serbia | 1 |
| Armenia | 1 | Egypt | 2 | South Africa | 3 |
| Brazil | 3 | India | 4 | | |
| Canada | 1 | Mexico | 2 | Total | 28 |
| Chile | 1 | Palestine | 1 | Grand total | 4,031 |
| China | 2 | Philippine Islands | 4 | | |

KANSAS COUNTIES.

| | | | | | |
|---|---|---|---|---|---|
| Allen | 28 | Greenwood | 30 | Pawnee | 24 |
| Anderson | 16 | Hamilton | 6 | Phillips | 32 |
| Atchison | 19 | Harper | 22 | Pottawatomie | 91 |
| Barber | 28 | Harvey | 25 | Pratt | 24 |
| Barton | 34 | Hodgeman | 3 | Rawlins | 4 |
| Bourbon | 14 | Jackson | 47 | Reno | 67 |
| Brown | 46 | Jefferson | 27 | Republic | 64 |
| Butler | 48 | Jewell | 41 | Rice | 17 |
| Chase | 25 | Johnson | 33 | Riley | 1,052 |
| Chautauqua | 11 | Kearny | 2 | Rooks | 9 |
| Cherokee | 14 | Kingman | 9 | Rush | 4 |
| Cheyenne | 4 | Kiowa | 10 | Russell | 8 |
| Clark | 9 | Labette | 17 | Saline | 60 |
| Clay | 68 | Lane | 2 | Scott | 6 |
| Cloud | 63 | Leavenworth | 19 | Sedgwick | 74 |
| Coffey | 32 | Lincoln | 21 | Seward | 14 |
| Comanche | 12 | Linn | 11 | Shawnee | 115 |
| Cowley | 23 | Logan | 9 | Sheridan | 2 |
| Crawford | 13 | Lyon | 28 | Sherman | 8 |
| Decatur | 13 | McPherson | 34 | Smith | 23 |
| Dickinson | 101 | Marion | 34 | Stafford | 32 |
| Doniphan | 15 | Marshall | 102 | Stanton | 3 |
| Douglas | 17 | Meade | 9 | Stevens | 4 |
| Edwards | 14 | Miami | 12 | Sumner | 46 |
| Elk | 8 | Mitchell | 31 | Thomas | 10 |
| Ellis | 13 | Montgomery | 42 | Trego | 9 |
| Ellsworth | 15 | Morris | 34 | Wabaunsee | 45 |
| Finney | 9 | Morton | 3 | Wallace | 2 |
| Ford | 29 | Nemaha | 23 | Washington | 70 |
| Franklin | 18 | Neosho | 25 | Wichita | 4 |
| Geary | 52 | Ness | 15 | Wilson | 20 |
| Gove | 11 | Norton | 36 | Woodson | 12 |
| Graham | 9 | Osage | 39 | Wyandotte | 90 |
| Gray | 2 | Osborne | 36 | | |
| Greeley | 1 | Ottawa | 41 | Total | 3,757 |

## College Enrollment, 1924-'25

| The Divisions. | Men. | Women. | Total. |
|---|---|---|---|
| **The Division of Agriculture** | **511** | **5** | **516** |
| Graduate students | 48 | 1 | 49 |
| Seniors | 61 | ..... | 61 |
| Juniors | 59 | 1 | 60 |
| Sophomores | 77 | 1 | 78 |
| Freshmen | 167 | 1 | 168 |
| Special students | 26 | ..... | 26 |
| Students in Farmers' Short Course | 54 | 1 | 55 |
| Students in Creamery Short Course | 14 | ..... | 14 |
| Students in Wheat and Flour Testing Short Course | 5 | ..... | 5 |
| **The Division of Veterinary Medicine** | **72** | ..... | **72** |
| Graduate students | 9 | ..... | 9 |
| Seniors | 15 | ..... | 15 |
| Juniors | 11 | ..... | 11 |
| Sophomores | 13 | ..... | 13 |
| Freshmen | 24 | ..... | 24 |
| Special students | ..... | ..... | ..... |
| **The Division of Engineering** | **944** | **3** | **947** |
| Graduate students | 31 | 2 | 33 |
| Seniors | 83 | ..... | 83 |
| Juniors | 147 | ..... | 147 |
| Sophomores | 206 | ..... | 206 |
| Freshmen | 416 | 1 | 417 |
| Special students | 7 | ..... | 7 |
| Students in Auto Mechanics' Short Course | 14 | ..... | 14 |
| Students in Tractor Operators' Short Course | 13 | ..... | 13 |
| Students in Engineering Trades' Courses | 10 | ..... | 10 |
| Students in other Engineering Short Courses | 17 | ..... | 17 |
| **The Division of Home Economics** | ..... | **571** | **571** |
| Graduate students | ..... | 24 | 24 |
| Seniors | ..... | 74 | 74 |
| Juniors | ..... | 104 | 104 |
| Sophomores | ..... | 119 | 119 |
| Freshmen | ..... | 222 | 222 |
| Special students | ..... | 14 | 14 |
| Students in Housekeepers' Short Course | ..... | 14 | 14 |
| **The Division of General Science** | **755** | **489** | **1,244** |
| Graduate students | 50 | 20 | 70 |
| Seniors | 65 | 49 | 114 |
| Juniors | 82 | 63 | 145 |
| Sophomores | 145 | 118 | 263 |
| Freshmen | 358 | 202 | 560 |
| Special students | 55 | 37 | 92 |
| **The Vocational School** | **43** | **4** | **47** |
| Nongraded Agriculture (U. S. War Veterans' Bureau) | 35 | ..... | 35 |
| **The Summer School** | **460** | **660** | **1,120** |
| Totals | 2,785 | 1,732 | 4,517 |
| Counted twice | 296 | 190 | 486 |
| **Net totals** | **2,489** | **1,542** | **4,031** |

## Record of Attendance, 1863-1925

| | Summer school | Housekeepers' 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 | Advanced degrees‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 1 |
| 1875-'76 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 232 | 5 | .... |
| 1876-'77 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 234 | 9 | 1 |
| 1877-'78 | .... | .... | .... | .... | .... | .... | .... | 75 | .... | .... | 42 | 23 | 5 | 5 | .... | .... | 150 | 4 | .... |
| 1878-'79 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | 89 | 89 | 16 | 12 | .... | .... | 207 | 9 | 2 |
| 1879-'80 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | 166 | 61 | 35 | 11 | 2 | .... | 276 | 7 | 2 |
| 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 | 3 |
| 1883-'84 | .... | .... | .... | .... | .... | .... | 2 | .... | .... | .... | 255 | 92 | 26 | 18 | 2 | .... | 395 | 17 | .... |
| 1884-'85 | .... | .... | .... | .... | .... | .... | 2 | .... | .... | .... | 271 | 71 | 36 | 16 | 5 | .... | 401 | 14 | 1 |
| 1885-'86 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | 273 | 91 | 35 | 24 | 4 | .... | 428 | 21 | 2 |
| 1886-'87 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 303 | 100 | 44 | 24 | 10 | .... | 481 | 22 | 5 |
| 1887-'88 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 305 | 92 | 46 | 27 | 2 | .... | 472 | 22 | 1 |
| 1888-'89 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 266 | 103 | 41 | 28 | 7 | .... | 445 | 25 | .... |
| 1889-'90 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | 307 | 105 | 63 | 28 | 10 | .... | 514 | 27 | 1 |
| 1890-'91 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 343 | 135 | 50 | 53 | 12 | .... | 593 | 52 | 2 |
| 1891-'92 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 336 | 139 | 62 | 37 | 10 | .... | 584 | 35 | .... |
| 1892-'93 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 339 | 110 | 66 | 43 | 29 | .... | 587 | 39 | 9 |
| 1893-'94 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 275 | 141 | 72 | 42 | 25 | .... | 555 | 39 | 6 |
| 1894-'95 | .... | .... | .... | .... | .... | .... | 5 | .... | .... | .... | 276 | 108 | 89 | 64 | 39 | .... | 572 | 57 | 3 |
| 1895-'96 | .... | .... | .... | .... | .... | .... | 3 | .... | .... | .... | 353 | 121 | 67 | 71 | 32 | .... | 647 | 66 | 4 |
| 1896-'97 | .... | .... | .... | .... | .... | .... | 6 | 67 | .... | .... | 321 | 163 | 69 | 62 | 46 | .... | 734 | 55 | 8 |
| 1897-'98 | .... | .... | .... | 6 | .... | 9 | 15 | 77 | .... | .... | 316 | 174 | 77 | 82 | 57 | 10 | 803 | 69 | 10 |
| 1898-'99 | .... | .... | .... | 26 | .... | 35 | 40 | 110 | .... | .... | 306 | 177 | 92 | 65 | 40 | 21 | 870 | 53 | 9 |
| 1899-1900 | .... | 24 | .... | 57 | 47 | 50 | 32 | 162 | .... | .... | 376 | 163 | 109 | 69 | 27 | 22 | 1,094 | 58 | 3 |
| 1900-'01 | .... | 47 | .... | 72 | 109 | 79 | 23 | 318 | .... | .... | 348 | 183 | 80 | 74 | 40 | 52 | 1,321 | 60 | 9 |
| 1901-'02 | .... | 41 | .... | 66 | 125 | 87 | 19 | 298 | .... | .... | 396 | 206 | 120 | 65 | 32 | 59 | 1,396 | 52 | 3 |
| 1902-'03 | .... | 63 | .... | 38 | 123 | 78 | 36 | 42 | .... | .... | 471 | 229 | 141 | 86 | 24 | 57 | 1,574 | 55 | .... |
| 1903-'04 | 17 | 51 | .... | 16 | 122 | 72 | 33 | 443 | .... | .... | 403 | 206 | 161 | 114 | 20 | 36 | 1,605 | 102 | 1 |
| 1904-'05 | 15 | 88 | .... | 24 | 99 | 12 | 30 | 500 | .... | .... | 289 | 198 | 122 | 117 | 26 | 43 | 1,462 | 107 | 2 |
| 1905-'06 | 18 | 92 | .... | 28 | 118 | .... | 46 | 598 | .... | .... | 373 | 214 | 145 | 110 | 30 | 64 | 1,690 | 96 | 4 |
| 1906-'07 | 18 | 134 | .... | 23 | 179 | Engineering | 48 | 144 | 511 | .... | 411 | 269 | 149 | 133 | 24 | 88 | 1,937 | 119 | 4 |
| 1907-'08 | 29 | 188 | .... | 26 | 173 | Short Courses | 42 | 134 | 528 | .... | 450 | 357 | 202 | 148 | 26 | 82 | 2,192 | 116 | 3 |
| 1908-'09 | 25 | 168 | .... | 18 | 197 | | 42 | 134 | 521 | .... | 491 | 381 | 243 | 171 | 28 | 86 | 2,308 | 139 | 12 |
| 1909-'10 | 22 | 152 | 4 | 111 | 124 | | 87 | 89 | 453 | .... | 456 | 417 | 286 | 170 | 26 | 70 | 2,305 | 145 | 2 |
| 1910-'11 | 31 | 142 | 9 | 26 | 285 | | 94 | .... | 364 | .... | 533 | 412 | 288 | 248 | 34 | 59 | 2,407 | 203 | 2 |
| 1911-'12 | 94 | 160 | 14 | Lunch room management | 280 | | 85 | Milling Short Courses | 580 | .... | 337 | 461 | 288 | 261 | 44 | 81 | 2,523 | 230 | 6 |
| 1912-'13 | 282 | 175 | 11 | | 289 | | 129 | | 654 | .... | 444 | 432 | 355 | 268 | 50 | 166 | 2,928 | 228 | 4 |
| 1913-'14 | 370 | 149 | 12 | | 223 | | 112 | | .... | 658 | 516 | 431 | 324 | 327 | 64 | 159 | 3,027 | 283 | 8 |
| 1914-'15 | 472 | 127 | 18 | | 199 | | 120 | | .... | 560 | 575 | 368 | 383 | 321 | 50 | 200 | 3,091 | 223 | 6 |
| 1915-'16 | 536 | 85 | 17 | | 207 | | 175 | | .... | 484 | 605 | 454 | 305 | 401 | 76 | 219 | 3,314 | 341 | 18 |
| 1916-'17 | 586 | 103 | 14 | | 228 | | 171 | | .... | 422 | 693 | 471 | 378 | 282 | 68 | 277 | 3,340 | 197 | 13 |
| 1917-'18 | 481 | 92 | .... | 8 | 119 | | 138 | | .... | 231 | 483 | 349 | 294 | 239 | 36 | 190 | 2,406 | 216 | 17 |
| 1918-'19 | 519 | 25 | 5 | .... | 160 | | 199 | | .... | 216 | 810 | 322 | 254 | 201 | 34 | 144 | 2,991 | 167 | 7 |
| 1919-'20 | 415 | 57 | 3 | 6 | 117 | | 354 | | .... | 224 | 894 | 401 | 300 | 269 | 43 | 167 | 3,352 | 260 | 11 |
| 1920-'21 | 604 | 30 | 10 | .... | 96 | | 278 | | .... | 280 | 878 | 602 | 318 | 273 | 42 | 294 | 3,395 | 248 | 14 |
| 1921-'22 | 820 | 19 | 10 | .... | 59 | | 173 | | .... | 221 | 931 | 628 | 422 | 296 | 125 | 813 | 3,560 | 271 | 28 |
| 1922-'23 | 884 | 19 | 8 | .... | 55 | | 83 | | .... | 220 | 1004 | 656 | 460 | 401 | 118 | 457 | 3,626 | 341 | 31 |
| 1923-'24 | 978 | 12 | 7 | .... | 43 | | 57 | | .... | 167 | 1160 | 657 | 458 | 413 | 171 | 475 | 3,812 | 342 | 43 |
| 1924-'25 | 1120 | 14 | 14 | .... | 55 | | 54 | | .... | 12 | 1391 | 679 | 467 | 347 | 185 | 486 | 4,031 | .... | .... |

* Estimated. † Calendar year. ‡ Incomplete data.

# Home Study Service Students

(Instruction by Correspondence)

For the year January 1, 1924, to January 1, 1925, those who took credit courses numbered 865, and those who enrolled in vocational courses numbered 62.

In the following list, those taking college credit courses are indicated by (c), those taking high-school courses by (p), and those taking vocational courses by (v).

Where enrollments are from Kansas the name of the state is omitted. It is given in all other cases.

Hattie Abbott (c); Altamont
Ralph Adams (c); Manhattan
Ray Adams (c); Topeka
Mrs. Dorothea Ackley (c); Portis
Iva M. Adams (c); Tarkio, Mo.
Hazel D. Adams (p); Wichita
R. Orde Addams (p); Blue Rapids
Georgene Affleck (c); Palmer
Waldo E. Aikins (c); Valley Falls
Eula Anderson (p); Neodesha
K. O. Alberti (c); Kansas City
Donald R. Allen, (c); Wichita
Hazel Allen (p); Garrison
Ethel Alvey (c); St. Joseph, Ky.
Olive Anderson (p); Stapleton, Neb.
Chas. B. Anderson (p); Topeka
Glen Anderson (c); Iola
Mildred Anderson (c); Clifton
Mabel Anderson (c); Vesper
Mrs. Bethel Andrews (c); Wamego
Elmer E. Archer (c); Manhattan
Orris F. Armantrout (c); Wichita
Alfred L. Arnold (c); Manhattan
Dorsey Artley (v); Independence, Mo.
Harold B. Axtell (c); Topeka
Mary F. Bacon (c); Bethany, Mo.
R. R. Baird (c); Riley
Guy N. Baker (c); Syracuse
J. W. Ballard (c); Almena
Margaret Ballard (p); Enterprise
Nellie Bare (c); Protection
Harold N. Barham (c); Eureka
Nellie Barnes (c); Milton
Marjorie Barth (c); Manhattan
Sister M. Euphrasia Barth (p); Concordia
Vada Opal Batterton (c); Pratt
Anna L. Bearg (p); Marysville
Edna L. Beckman (c); Kansas City, Mo.
Bernadine Beery (p); Leavenworth
Mrs. Ruth Beeson (c); Wamego
F. H. Beedle (c); Stapleton, Neb.
Ruth Beeson (c); Wamego
W. R. Bell (c); Kinsley
Robt. W. Berry (p); Manhattan
Myrtle Bennett (c); Cheney
Jack D. Bennett (c); Concordia
Mildred Bennett (p); Hardtner
L. Voshelle Berger (c); Oil Hill
Elsie Bergstrom (c); Green
Dean Berlin (c); Ottawa
Catherine Bernheisel (c); Manhattan
Alberta Berry (p); Garden City
Buy C. Bigelow (p); Manhattan
Ralph B. Bilson (c); Eureka
Harry Leonard Binder (p); Florence
Mrs. J. A. Birsell (v); Sedgwick
R. F. Blanks (c); Manhattan
Laura Blazek (p); Cuba
Mrs. F. A. Bleger (c); Wichita
Bonnie Grace Blevins (p); Ellinwood
Bessie Blickenstaff (p); Norton
Mary E. Boid (c); Culbertson, Mont.
Roxie Bolinger (c); Washington
Reba Bommer (c); Oketo
Lillian Boothe (c); Manhattan
Roy E. Boroff (c); East Pittsburgh, Pa.
Leo D. Bottenfield (v); Joplin, Mo.
Austin Boughner (p); Iuka
Mrs. G. H. Bowman (v); Logan
L. J. Bowman (c); Manhattan
Lora Boydston (c); Eureka
Helen Boyd (c); Houston, Tex.
Irene Brandt (p); Hill City
Gerhardt Brauer (p); Herington
Margaret Brenner (c); Waterville
Lola G. Brinker (c); Goodland.
Lawrence Briscoe (c); Arkansas City
Augusta Britschge (p); Wamego
Ellis O. Braught (c); Wellington
Claude Harold Brown (c); Winfield
Floye B. Brown (c); Goff
Iva Bruce (p); Winfield
James C. Bruce (p); Junction City
Wm. T. Bruney (c); Russell
Wayne Buehler (p); Hiawatha.
Margaret R. Buchman (c); Manhattan
Mrs. D. V. Buchanan (v); Matfield Green
Clara E. Buck (c); Merriam
Wilma Mae Bucknell (c); Olathe
Gladys E. Bumgardner (c); Holton
Opal Bumphrey (p); Corning
Mrs. Earl F. Burk (c); Garden City
J. W. Burr (c); Elizabeth, N. J.
Mrs. J. W. Burr (c); Elizabeth, N. J.
Florence M. Burton (c); Haddam
O. P. Butler (c); Farmington
Ward Butler (c); Glasco
Genevieve Butler (p); Glasco
Lottie May Butts (c); Manhattan
Bertha Butz (p); Bucklin
D. C. Bushey (c); Muscotah
Martha Jean Byall (c); Sterling
A. V. Byarlay (v); Bala
Wm. T. Byrd (v); McLain, Miss.
Ira Call (c); Downs
Mrs. Imogene Call (c); Downs
George Callis (c); Chase
R. E. Callis (c); Manhattan
Arden G. Campbell (c); Manhattan
Mary Capper (c); Ames
Mabel Carmean (c); Manhattan
Charles Carroll (p); Norton
Edison Carr (v); New Albany, Miss.
Bruce L. Cartter (c); Marinette, Wis.
Jack Cassetty (p); Junction City
A. B. Cash (c); Centerville
Helen Edythe Cass (c); Manhattan
Mrs. Lucy E. Caster (c); Manhattan
Mrs. Jack Chambers (c); Cleburne
Everett Chance (p); Iuka
Edward Chapman (c); Calumet City, Ill.
Esther Chase (c); Protection.
J. M. Cheatham (p); Bucklin
Edna Childers (c); Wamego

HOME STUDY SERVICE STUDENTS—*Continued.*

Thelma Child (p); Wamego
L. E. Christie (v); Jamestown.
Willis R. Churchill (p); Kansas City, Mo.
Frank Clark (p); Junction City
Louise Clark (p); Junction City
Chas. W. Claybaugh (c); Pretty Prairie
Ethel Cline (p); Iuka
Irene Coats (p); Preston
Owen Cochrane (c); Manhattan
Florence E. Coleman (c); Goddard
E. Elwood Coleman (c); Alma
Neil W. Collins (p); Washington
Grace Cole (c); Hardin, Mo.
Leslie R. Combs (c); Manhattan
Seth W. Compoton (p); Stapleton, Neb.
C. N. Constable (c); Atwood
Ralph E. Conrad (v); Osceola, Mo.
J. J. Connolly (p); Manhattan
Frances W. Conrow (c); Manhattan
Mildred Cook (p); Neodesha
Earl T. Correll (p); Manhattan
Ray Cornelius (c); Zenda
Mary Ellen Cormany (c); Tulsa, Okla.
Myron Coryell (p); Junction City
Katherine Coryell (c); Junction City
Mary Jo. Cortelyou (p); Manhattan
James C. Costello (p); Prairie View
Sister M. Frances Costello (c); Manhattar
Felix E. Cottle (p); Castleton
Gladys Couchman (p); Arlington
John H. Cox (c); Assaria
Geo. M. Crawford (c); Wichita
Claude S. Crowley (v); Chicago, Ill.
Marie Crow (p); Dighton
Laurel Crow (c); Garden City
R. P. Cross (c); Reading
Ed. Cunningham (c); Manhattan
Beth Currie (c); Manhattan
D. E. Curry (c); Hollenberg
C. Bulah Cully (p); Harper
Mary E. Cunningham (c); Manhattan
Ruby Curl (c); Olsburg
Eva Cunningham (c); Farber, Mo.
Jno. R. Dahl (v); Colby
Walter J. Daly (c); Manhattan
Lee Edwin Dale (p); Ellinwood
Rachael C. Dalquest (p); Junction City
Eugene Dalrymple (c); Manhattan
Joe Dalrymple (p); Simpson
May Danheim (c); Blue Rapids
Hazel Danielson (p); Stapleton, Neb.
Lyle H. Davis (c); Tescott.
Anna M. Davis (c); Manhattan
Vivien Davis (p); Berryton
Norma Davis (c); Frankfort
Clayton Davis (c); Fredonia
Grace Davison (c); Manhattan
Jessie Davisson (c); Burr Oak
Aulls Day (p); Bucklin
Virginia Deal (c); Kansas City, Mo.
Edith I. Deck (c); Winfield
Manly Deering (p); Clements
Helen Deely (c); Clay Center
Hazel Denison (c); Wellington
Mrs. E. P. Desmarias (c); Meade
Nell De Witt (c); Manhattan
Mary Dey (c); Wellington
Clara De Witt (p); Winfield
Ernestine Hazel Deweese (p); Attica
I. G. Dettmer (c); Bushong
Myrle Divelbiss (c); Olathe
Helen E. Diller (c); Morrowville
Curtis W. Dickson (p); Manhattan
A. W. Dooley (c); Burns
Arthur Doolen (c); Kinnundy, Ill.
Ruth Dotson (p); Glasco
Mrs. Allie Doty (p); Rogers, Ark.
Helen May Dowell (c); Hamlin
Margaret Dowell (c); Hamlin
Arnold Dowell (c); Hamlin
Floyd S. Drake (p); Attica
Margery Dryden (c); Parsons
Mrs. Hilda Frost Dunlap (c); Manhattan
Jack W. Dunlap (c); Manhattan
Edwin O. Earl (c); Nickerson
A. D. Edgar (c); Manhattan
Sidney Eberhart (c); Topeka
H. G. Eberhardt (c); Topeka
Roland Edwards (p); Norwich
Amy Elliot (p); Turon
Wm. H. Elliott (c); Chillicothe, Mo.
Elizabeth Elledge (c); Parsons
Blanche Elliott (c); Manhattan
Irene Emerson (c); Coldwater
Bertha Erickson (p); Morrowville
Alma Ephraimson (c); Kansas City
L. E. Erwin (c); Manhattan
B. C. Eutsler (p); Concordia
H. Leslie Evans (c); Austin, Tex.
Frances Faith (c); Salina
J. T. Falk (p); Cogswell, N. Dak.
Viola Fansler (p); Riley
J. A. Farmer (c); St. Joseph, Mo.
Ruth Faris (c); Kansas City
Ruby M. Faris (c); Kansas City
V. O. Farnsworth (c); Topeka
John A. Fay (v); Seattle, Wash.
Ralph Ferris (p); Chapman
Esther L. Ferguson (p); Jasper, Mo.
Raymond V. Fickel (p); Jamestown
Arliene Finch (c); Oketo
H. M. Fletcher (p); Salina
Mark H. Flick (c); Manhattan
Ernest H. Fleming (v); Enterprise, Ala.
Daisy Boswell Floyd (p); Manhattan
Carl E. Fogleman (c); Manhattan
Mary Foley (c); North Platte, Neb.
Myron Forbes (v); San Francisco, Cal.
Robert W. Fort (c); Manhattan
Hilma Marie Freeman (c); Courtland
C. E. Francis (p); Westmoreland
Eugene Frazier (p); Bucklin
Clifford Freeman (v); Bassfield, Miss.
Mary M. Friemyer (p); Saint Charles, S. Dak.
Lena A. Frey (c); Vassar
Mae Frey (p); Carbondale.
Erma Fromme (p); Bucklin
Gertrude Fulton (c); Manhattan
Ada Fullinwider (c); Partridge
Isabel Gallemore (c); Arkansas City
Paul Galloway (p); Neodesha
Martha Gallup (p); Altamont
Mrs. H. C. Gale (c); Clyde
Stella Gano (p); Barnes
Willis E. Garratt (p); Keatley, Utah
Sam P. Gatz (c); Manhattan
Lorena Gathers (c); Miltonvale
Bessie Geffert (c); Manhattan
Grace Day Geffert (c); Greenleaf
Verda Verene German (c); Glen Elder
Harvey German (c); Little River
Mrs. Edith Gere (v); Pretty Prairie
Crawford Gillaim (p); Mullinville
Philip C. Girlinghouse (v); Athens, La.
Josephine Gill (c); Manhattan
C. R. Gilbert (c); Seattle, Wash.
Clair V. Gilbert (p); Broadwater, Neb.
Vena Glassburn (p); Freeport
Laird V. Glasscock (c); Parkerville
Louise Glick (c); Jewell
R. W. Godfrey (c); Deerfield
Sister M. Gonzaga (c); Atchison
Vida Goodenon (p); Hill City
Mrs. Agnes Goff (c); Stockdale
A. E. Goodwin (c); Concordia
Ray Gomel (c); Oak Hill
Minnie Elizabeth Gossman (c); Goldburg, Idaho.
C. R. Gottschall (c); Ada.

HOME STUDY SERVICE STUDENTS—*Continued.*

Beulah Gray (p); Turon.
Lola Grahem (c); Manhattan
Alice C. Graham (v); The Dalles, Ore.
Esther Irene Grandon (c); Topeka
Agnes Gresham (p); Bucklin
Juanita Green (p); Norwich
Martha Green (c); Hutchinson
Frank Gregor (p); Wilson
Edna Greenstreet (p); Osage City
Mrs. Ruth Green (c); Jewell
Mrs. Della Gridley (c); Oakley
Gertrude Grieve (c); Wamego
C. C. Griffin (c); Manhattan
Mrs. L. E. Griffith (c); Ottawa
Lou W. Grothusen (c); Ellsworth
Welthalee Grovere (c); Iola
C. D. Guy (v); Harper
Elizabeth Guthrie (c); Kansas City, Mo.
Ernest H. Gwinn (v); Topeka
Clyde Haden (p); Blue Rapids
Frank A. Hagans (c); Manhattan
Geo. Haines (v); Hinckley, Minn.
Harry Halbower (c); Wichita
E. W. Hall (c); Manhattan
Albert A. Haltom (c); Alden
Mary O. Hall (c); New Albany
Mary E. Haller (c); Newton
Richard Hamler (c); Manhattan
Pinckney L. Hamilton (p); Wichita
Wm. R. Hamme (c); Atchison
Clarence M. Hammond (c); Ulysses
Doris Handlin (p); Manhattan
Leota Hansen (c); Willis
Florence Harris (c); Manhattan
R. T. Harper (c); Frankfort
L. M. Harper (c); Augusta
Marion Harper (p); Densmore
Carl Hartman (c); Manhattan
Clarence L. Harder (c); Manhattan
Mary Harman (p); Osage City
Nelle Hartwig (c); Goodland
Nestar Carl Hardin (c); Kasson, W. Va.
Howard T. Harmon (c); Girard
Thelma Harvey (p); Stapleton, Neb.
Marguerite Velma Harper (c);
Ponca City, Okla.
Mabel Harris (c); Westville, Ind.
Lillian Haugsted (c); Manhattan
Everett Haukenberry (c); Arvada, Wyo.
Marjorie Hawthorne (c); Gypsum City
Edith Hassinger (c); Parsons
Alfred S. Hawkey (c); Hesston
F. C. Hays (p); Independence
Evalena Haynes (p); Preston
Ralph Heanell (c); Galena
Hazel Heffelflinger (c); Manhattan
Henry Hehn (v); Pollock, S. Dak.
Helen Heise (c); Manhattan
Dwight C. Hendricks (p); Manhattan
John Henry (c); St. Francis.
M. R. Henre (c); Dunlap
Beulah Henderson (c); Solomon
Wm. Hendrix (v); Campbell, Tex.
George E. Hendrix (c); Manhattan
Mary Henry (c); St. Francis
John H. Kerr (c); Regina, N. M.
Violet E. Hern (p); Wamego
Wesley Herren (c); Woodbine
Sherman Herren (c); Manhattan
Irene Herring (p); Weir
Brian Higgins (p); Blaine
H. W. Higbee (p); Fall River
Violet Hilgardner (c); Kansas City
Kenneth Hill (p); Barnes
Beulah Higbee (c); Deerfield, Mo.
Emma Hilton (c); Caney
Carl Hoelzel (c); Manhattan
Ruth Hochuli (c); Holton
Harold Hoffman (c); Wichita
Grace D. Hofsess (c); Partridge
Farrel R. Holt (p); Cambridge
John P. Holt (p); Kansas City, Mo.
Harley Holliday (p); Centralia
E. R. Honeywell (c); Columbia, Mo.
Ruth Hope (c); Kansas City
Geo. C. Horning (p); Hunter
D. Hout (c); Formoso
Doris Howe (c); Union Star, Mo.
L. C. Howard (c); Grass Range, Mont.
Muriel Howard (p); Manhattan
Whilmetta G. Howard (p); Russell Springs
Helen Huey (c); Wamego
Rex R. Huey (c); Louisville
Melba Huffman (p); Beloit
James F. Hughes (v); Hayward, Cal.
Frank Hulsopple (p); Scranton
Walter Hukriede (c); Cleburne
Artie Hulsopple (p); Scranton
Doris M. Hull (c); Caldwell
Berniece Humbert (c); Hutchinson
Clinton Humbert (v); Newton
W. W. Humphrey (c); Manhattan
A. G. Hunt (c); Burdette
Rena A. Hunt (p); Crisfield
Glade W. Hurst (p); Padonia
Clifford Husband (p); Wilsey
L. E. Houston (c); Roxbury
R. V. Hutton (c); Manhattan
Isaac Huskey (c); Wheat, Tenn.
Herbert E. Hutchison (p); Lincoln
Corwin F. Hutton (c); Washington
Edw. C. Hutchings (c); Manhattan
V. L. Hybskmann (c); Corning
John Hyer (c); Coffeyville
Margaret Hyde (p); Kansas City
James Ingwersen (p); Le Roy
Hal F. Irwin (c); Manhattan
Geraldine Jackson (p); Bucklin
Nellie Jacobs (p); Manhattan
Harry F. Jackman, Jr. (p); Minneapolis
Albert James (c); Clay Center
Mildred Jackson (c); Powersville, Mo.
Arthur James (c); St. Charles, Mo.
Vera James (p); Clay Center
Russell E. James (p); Wetmore
Geraldine Jarrett (c); Scranton
Anna A. Jacobs (c); McCune
Hazel Jackson (c); Powersville, Mo.
Julia Jennings (c); Little River
Wm. Harold Jeffrey (c); Manhattan
E. J. Jelden (c); Whitewater
Arthur Jenkins (v); Independence
Elza Jernigan (p); Osage City
Bertha Jenkins (v); Stapleton, Neb.
Pearl Jepson (c); Cleburne
Frankie Johnson (c); Wamego
Minnie Johnson (c); Manhattan
Harold Johnston (c); Manhattan
Edwin A. Jones (v); Topeka
Florence Jones (p); Waldron
Florence Jones (c); Nara Visa, N. M.
Orpha E. Jones (p); Hutchinson
Grace Justin (c); Manhattan
Mary Kahler, (c); Wamego
Alberta Kearnes (p); Auburn, Neb.
Irene Keefe (p); Anness
Isabel Keeler (v); La Vina, Cal.
Nellie Keen (p); Irving
C. H. Kenison (c); Solomon
Gray Kenney (p); Norton
Harlan Kerr (p); Phillipsburg
Chandler Key (p); Leavenworth
John Kerr (c); Regina, N. M.
Julia Kiddoo (c); Independence
Elmira King (c); Manhattan
Harold L. Kimball (v); Pequot, Minn.
Gladys R. Kimmal (c); Los Angeles, Cal.
Ruth King (c); Windom

HOME STUDY SERVICE STUDENTS—*Continued.*

Julia King (c); Manhattan
Jacob W. Knecht (v); Bismarck, N. Dak.
Earl M. Knepp (c); Manhattan
Kenneth Knouse (c); Valley Falls
Fred Knuth (p); Leavenworth
Frances Kope (p); Winfield
Milton Koopman, (p); Bucklin
J. C. Krysl (c); Lucas
Augusta Kuehn (p); Nashville
Venda Laman (c); Portis
Anna M. Lampe (p); Spearville
Ernest La Monte (p); Turon
Charlotte Landrum (c); Louisville
E. W. Larson (c); Manhattan
Florence Larmer (c); Courtland
Geo. Larzalere (p); Minneapolis
Signor M. Larsen (p); West Branch, Iowa
Isabel Laughbaum (c); Oklahoma City, Okla.
Ethel Learned (p); Sylvia
Wilmer H. Learned (c); Zenith
Clarisse Leger (p); Sharon Springs
Glenn Lehman (c); Manhattan
J. Clyde Lentz (c); Manhattan
Goloda Leichliter (p); Norton
Virgil Leonard (c); Jennings
Edna Lewis (p); Concordia
Una Minnette Le Vitt (p); Wilson
Ruth Limbocker (c); Manhattan
Vera May Limbocker (p); Manhattan
Ralph Lineback (p); Moran
Jeanne Lingenfelter (c); Kansas City, Mo.
Carl E. Linden (v); Ogilvie, Minn.
Hardin Lineback (c); Moran
Betty Lloyd (c); Leavenworth
Velma Lockridge (c); Manhattan
Mary Belle Logan (c); Denver, Colo.
C. W. Louderholm (c); Amoret, Mo.
Other C. Loyd (v); Dadeville, Ala.
Thomas E. Lund (p); Alma
Ruth Luginbill (c); Greensburg
G. E. Lyness (c); Hays
Alta L. Magnuson (v); Stapleton, Neb.
Ralph L. Mahar (v); Kansas City, Mo.
Hazel Mahon (c); Elmont
Sister M. Adolphus Maloney (c); Junction City
Algie Manley (v); Albertville, Ala.
Robina Manley (c); Junction City
Leila Martin (c); Manhattan
Archie Marrs (v); Stapleton, Neb.
Elizabeth March (p); Edgeley, N. Dak.
Lee W. Marshall (c); Manhattan
Mrs. Ethel J. Marshall (c); Manhattan
Olin F. Marshall (v); Marysville
Paul E. Massey (c); Franktown, Colo.
Paul G. Martin (c); Manhattan
Mildred Mast (c); Goff
Mrs. Sherman Mathis (c); Smith Center
Mr. Sherman Mathis (c); Smith Center
W. J. Matthias, (c); Manhattan
Joseph C. Maurer (v); Little Falls, Minn.
C. De Witt Matsler (c); Hawk Point, Mo.
Hazel May (p); Manhattan
Earl McClanahan (p); Leavenworth
Audrey McCabe (p); Neodesha
Mabel McComb (c); Wichita
Hazel Bea McConnel (c); Russell
Elsie P. McCollum (c); Bogard, Mo.
Rose M. McCoy (c); Galena
Geneva McDaniels (c); Scottsville
Eliza McGraw (c); Eureka
Tom McGregor (p); Solomon
Anna McGavran (c); Larned
Clara O. McKee (p); Wichita
Claude R. McCray (p); Cherokee
Mary Ellen McLeod (p); Vermillion
Daisy McMullen (c); Oronoque
Elfie McMullen (c); Oronoque
Lois McNitt (c); Washington
Ruth McQueery (p); Bucklin
E. J. McWilliams (c); Manhattan
Nora Mead (c); Smith Center
Don Meek (c); Idana
D. F. Mellenbruch (c); Marysville
Lester Meyer (c); Linn
Gladys Meyer (c); Linn
M. B. Miller (c); Manhattan
Mrs. Jane Miller (v); Muscotah
Elizabeth Mills (c); Lake City
Enola Miller (c); Salina
Genevieve Miller (c); Lebanon
J. M. Miller (c); Long Beach, Cal.
Keith W. Miller (c); Kansas City, Mo.
Mrs. Anna J. Miller (c); Lebanon
Carl V. Miles (c); Maryville, Mo.
B. J. Miller (c); Manhattan
Percy S. Miller (c); Sawyer
Hugh R. Miracle (c); Wamego
Julius Mirico (p); Winona
Marion Mitchener (v); Lee's Summit, Mo.
Oscar Mitchell (p); Paola
Ida Mitchell (c); Manhattan
Mildred Mitchell (c); Manhattan
Dorothy Montgomery (p); Manhattan
Roy Moore (p); Manhattan
Ruth Moore (p); Abilene
Orville Moody (p); Ogden
Dale Morris (p); Medicine Lodge
Paul Morris (c); Alta Vista
Sarah Morris (c); Manhattan
Edward G. Norton (v); Seattle, Wash.
P. W. Morrison (c); Breckenridge, Tex.
Florence Mulvey (c); Rogers, Ark.
Albert D. Mueller (c); Hanover
Harold H. Munger (c); Manhattan
De Witt Murrell (p); Blue Rapids
Sister M. Natalie (c); Atchison
Thos. C. Neibling (p); Hiawatha
Harry H. Nelson (c); Wakarusa
P. E. Neale (c); Manhattan
Alis V. Nevens (p); Russell Springs
Clarence L. Nelson (p); Keats
Omar Need, Jr. (c); Oakhill
Lillian Nelson (p); Osage City
Lois Neill (c); Broughton
Eleanor A. Nelson (c); Nettleton, Mo.
Leonard G. Nehring (c); Alma
Sister M. Rosina Nolan (c); Leoville
Lars Nielson (c); Coldwater
James R. Nichols (p); Osage City
Mrs. Carrie L. Nixon (c); Manhattan
L. O. Nolf (c); St. John
Dorothy E. Noble (c); Wichita
Anna Nohlen (c); Cleburne
Walter North (p); Manhattan
Alger Nusbaum (p); Blue Rapids
Josephine Null (c); Emporia
Lillian Oyster (c); Paola
Viggo Olson (v); Cass Lake, Minn.
Arno R. Osterloh (v); Atwood
Geo. S. Oldson (c); Downs
Edward Pankratz (p); Lehigh
Vera Pantier (p); Formoso
N. Parker (c); Nara Visa, N. Mex.
Emma Parsons (c); Covert
Wallace Parsons (c); Covert
Bessie F. Patton (c); Savannah, Mo.
Dwight Patton (c); Harper
L. F. Payne (c); Manhattan
J. E. Payne, Jr. (c); Manhattan
Kate M. Penn (c); Broken Arrow, Okla.
Robert Perkins (c); Oswego.
W. W. Perham (c); Manhattan
R. T. Periman (c); Whitewater
Sylvia Petrie (c); Manhattan
Mrs. Anton Peterson (v); Jamestown
W. J. Peterson (v); Hays
Philip Peterson (p); Paola

HOME STUDY SERVICE STUDENTS—*Continued.*

Leland V. Peterson (v); Selby, S. Dak.
Alma Petrasek (c); Lincoln, Neb.
Ruth Phillips (c); Junction City
Myrna Pilley (c); Kansas City, Mo.
Helen Pickens (c); Lake City
Thelma Plesse (c); Wamego
Margaret Ploughe (c); Hutchinson
Ella Pooschke (v); Stapleton, Neb.
Grayce Porter (p); Junction City
Florence Powell (p); Delphos
Gladys Popham (c); Minneapolis
Mrs. Sibyl Porter (c); Manhattan
C. O. Price (p); Manhattan
Rubye K. Price (p); Bucklin
Carrie Pugh (c); Manhattan
Adeline Purma (c); Wilson
R. H. Pyle (c); Manhattan
Maloy Quinn (c); Junction City
Elizabeth Quail (c); Topeka
Ernest Quick (p); Spearville
Grace Radebaugh (c); Frankfort
Maxine Ransom (c); Downs
Sophia Rankin (c); Wamego
H. M. Randels (c); Anthony
E. C. Rasmussen (c); Cleburne
G. A. Read (p); Manhattan
Walter H. Reed (c); Manhattan
Virginia L. Reeder (c); Troy
Ruth E. Reed (c); Lyons
Geraldine Reed (c); Williamsburg
H. O. Reed (c); Manhattan
Iva Reese (p); Turon
Anna Rehberg (c); Bennington
Ernest L. Reichart (c); Kansas City, Mo.
Russell Reitz (c); Oil Hill
Grace L. Reitzel (c); Waterville
Emma Reuteler (p); Oshkosh, Wis.
Guy Rexroad (c); Partridge
Grace Reynolds (c); Holton
Henry Lee Rezabek (p); Wilson
Reva L. Rhoades (c); Potwin.
G. L. Rhoades (c); Calvert
Lyle Rinker (c); Ellinwood
Eugene Riley (v); Ford
L. T. Richards (c); Manhattan
Ruth Richmond (p); Parsons
Esther M. Rivers (c); Goodland
Glenn Rixon (c); Cimarron
Faye Roberts (p); Almena
Frank Robert (v); Potchefstroom, Transvaal, S. Africa.
Louise Robnett (c); Manhattan
H. H. Robinson (c); Augusta
G. O. Robinson (c); Senath, Mo.
Elizabeth Rodewald (c); Randolph
Laura A. Roepke (p); Topeka
Pearl Rorabaugh (c); Wichita
Wm. Thomas Ross (p); Russell Springs
Dorothy Rosebrough (c); Topeka
Earl Roten (v); Stapleton, Neb.
Mabel R. Rubart (c); Riley
Eastborn Rusco (c); West Lynn, Mass.
Charles E. Russell (c); Dewey, Okla.
Harvey Russell (c); Topeka
Lillian Russell (c); Wichita
Elwin Rutherford (c); Manhattan
C. W. Salter (c); Eldon, Mo.
Morse Salisbury (c); Manhattan
Beulah Sans (c); Murray, Neb.
Clara Schlaeffi (c); Cawker City
Rubey Schrock (p); Norton
Alice Schneider (p); Ellinwood
Zella Scott (c); Norton
Floyd F. Scott (c); Independence
Walter S. Scott (p); Kansas City
Ella Schrumpf (c); Cottonwood Falls
Fred Schmidt (p); Junction City
George R. Scripture (v); Rye, Colo.
Eva Seiber (c); Miami, Tex.
Grace Selden (c); Bigelow
Shendan Settler (c); Council Grove
Ethel Sexton (c); Abilene
Ruby Seward (c); Leon
Muriel Shaver (c); Cedarvale
Dora Shackelford (p); Arlington
L. B. Shallenberger (c); Baldwin, Iowa
Esther C. Sheely (p); Bucklin.
Dorothy Sheetz (c); Manhattan.
Gertrude Sheets (p); Admire
Jack W. Sheetz (c); Manhattan
Jeannetta F. Shields (c); Lost Springs
Elva Alyce Shover (c); Beeler
Ernest H. Simpson (c); Conway Springs
Deal Six (c); Manhattan.
H. E. Skoag (c); Corbin
Bessie Smith (c); Fredonia
N. R. Smith (c); Howard
Opal Smith (c); Manhattan
N. C. Smith (c); Lane
Mabel R. Smith (c); Eskridge
Lelah Smith (p); Salina
Lorena Smith (p); Liberal
Myrtle Smith (p); Junction City
Vern Smith (v); Preston, Minn.
Robert H. Smith (c); Redfield
Corinne Smith (c); Topeka
Treva Smith (p); Bucklin
Katie Grace Smith (c); Kingsdown
Esther Snodgrass (c); Manhattan
Loreen Sparks (p); Washington
Ellis G. Sparks (c); Bison
C. D. Spangler (c); Junction City
Geo. E. Starkey (c); Johnson
Henry Alva Stephens (p); Neodesha
H. G. Stahl, Jr. (p); Leavenworth
Lucile Stelter (p); Delphos
Geo. G. Steltz (v); Corona, S. Dak.
Perry Stillman (c); Nortonville
Edmund Stone (c); Manhattan
Sheldon B. Stover (c); Osborne
Austin Stover (c); Manhattan
Charles R. Stires (p); Herndon
C. W. Strand (p); Blue Rapids
Nile H. Strayer (v); Spencerville, Ohio
Paul S. Strand (p); Manhattan
Wilbur Strand (p); Blue Rapids
Fred D. Strickler (c); Hutchinson
Bert A. Strom (c); Salina
Sibyl Straub (p); Coffeyville
Theodore Stueber (c); Parsons
Harry Strand (p); Blue Rapids
Ralph Stutzman (p); Attica
Richard Stucky (c); Falun
William Sullivan (p); Weir
Zaven Surmelian (c); Manhattan
Danah Summers (c); Moscow
H. L. Summers (c); Manhattan
Mrs. Florence Dresser Syverud (c); Manhattan
Marion Swank (p); Hill City
Mabel H. Swanson (p); Waterville
Clarence A. Swenson (c); Kirwin
De Swinhart (v); Peabody
Dewey Taylor (c) Osborne
Lucille Taylor (p); Oswego
Gladys Taylor (c); Chapman
Donald Taylor (c); Topeka
Esther Taylor (v); Oakland
August F. Tanck (v); Winfred, S. Dak.
Orel Tackwell (p); Phillipsburg
Wayne Temple (p); Bartlett
Laureda Thompson (c); Manhattan
Irene H. Thomson (c); White Cloud
Elwin Thoes (p); Alma
Rebecca Thacher (p); Waterville
Esther Thomas (c); Manhattan
Beatrice Jane Thyer (c); Blue Mound
N. R. Thomasson (c); Parsons
Clarence Thompson (p); Bucklin

HOME STUDY SERVICE STUDENTS—*Concluded.*

Harold L. Thuma (v); Otis
Simon Tombaugh (c); Manhattan
Mrs. Clyde W. Totten (c); Lawrence
Milton Toburen (c); Manhattan
C. R. Townsend, Jr. (c); Centralia
E. W. Titterington (v); Topeka
Arthur Tonn (c); Haven
Doris Chapin Tower (c); Manhattan
E. E. Truby (c); Anthony
Rena Travis (c); Manhattan
Chloe Tracy (c); Manhattan
Leonard E. Tracy (p); Manhattan
Sarah Tracy (c); Manhattan
Floyd J. Tucker (c); Manhattan
L. J. Twibell (p); Vesper
Lois B. Turner (p); Valley Falls
Elizabeth Turner (c); Leavenworth
Undine Uhl (c); Holton
Anna Jean Unruh (c); Pawnee Rock
Margaret Vandeventer (c); Mankato
Helen Van Gilder (c); Manhattan
P. T. Van Arsdale (p); Wichita
J. L. Van Gilder (c); Welda
Verna Viehmeyer (v); Stapleton, Neb.
Chas. E. Vance (c); Garden City
Velma Vincent (c); Alden
Lola Vincent (c); Manhattan
Kathryn Voshell (p); Ford
Mary Waggoner (p); Paola
Vera Wagar (c); Florence
Jessie B. Wallace (p); Codell
Lewis M. Walker, Jr. (c); Manhattan
Troy Warren (c); Attica
Henry B. Warren (v); Eclectic, Ala.
Clarence D. Walker (p); Manhattan
Glen C. Ware (c); Larned
Dorothy Waters (c); Manhattan
Ben A. Watkins (v); Philadelphia, Miss.
Jewell K. Watt (c); Topeka
Alice Watson (c); Osage City
Elmer L. Watters (p); Marysville
Leota F. Wayland (c); Washington
Bertha Waters (c); Junction City
Cecelia J. Watson (c); Osage City
Eulalie Weber (c); Marysville
Elizabeth Webber (c); Norton
Ella Webb (c); Kansas City
H. G. Webber (c); Manhattan
Melvin Wehrman (p); Mulvane
Raymond Weaver (p); Wetmore
Edna Wells (p); Manhattan
Florence Wells (c); Meriden
Ruth E. Welton (c); Fairview
Chas. Wells (c); Chanute
John Wells (p); Osage City
George Wells (c); Parsons
Helen Weiters (p); Lanham
Fred Westbrook (c); Grace, Idaho
Agnes Wesley (c); Beloit
Rupert K. Wey (c); Kirwin
George S. Wheeler (c); Denver, Colo.
Sylvia M. Wheeler (p); Dellvale
Juanita White (p); Neodesha
Susanna Whitten (c); Thomasville, Mo.
Carl R. White (c); Kingsdown
Fred B. Whitehead (v); Topeka
Copeland Whitney (c); Manhattan
Verne Wickham (p); Manhattan
Barbara Wiedenmann (p); Hiattville
Daisy Wilson (p); Irving
Albert V. Wilson (c); Chula, Mo.
H. A. Williamson (c); Manhattan
Howard C. Williams (c); Cleburne
Wayne Willis (p); Stapleton, Neb.
Lottie Williams (p); Thomasville, Mo.
Hugh Willis (c); Lincoln, Neb.
Karl M. Wilson (c); Concordia
Lottie Williams (p); Thomasville, Mo.
Hugh Willis (c); Lincoln, Neb.
Berthena F. Willard (c); Garrison
Earl J. Wilson (c); Manhattan
Paul W. Williams (c); Olivet
Franklyn S. Williams (c); Rose Hill
Hypatia D. Wilcox (c); Wichita
Roy Williams (p); Elk Falls
Mrs. Cora B. Williams (c); Attica
Alice L. Williams (c); Conway Springs.
A. Clay Williams (c); Manhattan
Glen Wilson (p); Manhattan
L. Glenna Wilson (c); Independence
Stephen C. Williams (c); Maryville, Mo.
Edna Wismer (p); Norton
Linnie Mae Winslow (c); Carlton
Mrs. C. W. Winslow (c); Oakley
D. M. Wingfield (p); Junction City
Rebecca A. Wirt (c); Acton, Ind.
Ruth Wise (c); Clearwater
J. W. Wittmeyer (c); Stella, Neb.
Franklin N. Wray (c); Calumet City, Ill.
Rachel Wright (c); Manhattan
Marjorie Wright (c); Manhattan
Alice Wolfenbarger (p); Manhattan
Mildred Worster (p); Manhattan
Gracelee Woolverton (c) Abilene
Leroy L. Wurst (c); Chicago, Ill.
Fred Young (p), Bartlesville, Okla.
Hazel N. Youngquist (c); Blue Rapids
G. A. Youngstrom (c); Fredonia
Marion T. Yoakem (p), Clements
Mrs. Mary Yohe (p); Zurich
Frederick Geo. Young (c); Enterprise
Iscah M. Zahn (c); Wetmore
Melvin S. Zeigelasch (p); Junction City
Elizabeth Ziegenbush (p); Ellinwood
Helen B. Zellers (c); Holton
Mary V. Zehnder (p); Lancaster

# Student Organizations

## The Students' Self-governing Association

OFFICERS

Francis Eugene Wiebrecht, *President* Inga Ann Ross, *Secretary*
Christian Rugh, *Treasurer*

REPRESENTATIVES, THE EXECUTIVE COUNCIL

*Senior Class:*
Harold Gilman
Winifred Knight

*Junior Class:*
Norman Edward Palmquist
Margaret Avery

*Sophomore Class:*
Inez Jones
Fred Merle Shideler

*Freshman Class:*
Luella Lancaster
William Smith

*Men's Pan-Hellenic Council:*
Bruce Pratt

*Women's Pan-Hellenic Council:*
Inga Ann Ross

*Intersociety Council:*
George Montgomery
Ward Wesley Taylor

*Y. W. C. A.:*
Dorothy Rosebrough

*Y. M. C. A.:*
Christian Rugh

*W. A. A.:*
Genevieve Tracy

*"K" Fraternity:*
Charles Kuykendall

COMMITTEE CHAIRMEN

*Finance:*
Christian Rugh

*Discipline:*
Harold Gilman

*School Spirit ("Pep"):*
Charles Kuykendall

*Social Affairs and Calendar:*
Bruce Pratt

## College Band

Everett Harlan Anderson
Irvin Milburn Atkins
Roy Bainer
Howard David Banta
Louis Elbert Barber
Jesse Glenn Barnhart
Walter Halson Boorn
Richard Donald Bradley
John Thomas Brooks
Gerald George Brown
Robert Ambrose Brunson
Alex Byron Campbell
Paul Buchanan Cole
Kenneth Harold Cook
John Herbert Coolidge
John Francis Costello
George Everett Dean
Miriam Lanore Dexter
Robert Franklin Dice
Raymond Earl Dunnington
Joseph Edgar Durham
Harry Emanuel Erickson
Ralph Wilson Evans
Lawrence Stewart Farrell
Carl Faulconer
Frank Leroy Fear
Everett Emerson Fear
Gerald Emerson Ferris
Glen Robert Fockele
Margaret Foster
Elmer Ray Gillmore
Glenn Huff Graham
James Smith Griffes
Joe Douglass Haines
John Lewis Hancock
Harry Irvin Hazzard
Lucile Beatrice Heath
Walter Dietrich Hemker
Maurice Leroy Hill
Austin Clair Hoffman
Herschel Leroy Hoffman
Gordon Sheffield Hohn
Raymond Delbert Johnson
John Kesl, Jr.
William Kesl
Joe Donald Klahr
William Harold Newhard
Robert Leroy Owens
Iru Paul Price
Kenneth Edward Rector
Marion Joseph Reed
Chester Charles Remsberg
Wilmar Walton Sanders
Thomas DeWitt Saxe
Joy Lester Sherwood
Howard Dean Skaggs
Clinton Leonard Stalker
Gilbert King Terpening
Alex Van Pelt
George Robert Varney
Walter Francis Walker
Robert Lee Wilson
Loyal Venice Wimer
Clell Bruce Wisecup
Charles Wattes Withey
Duane Everett Wollner
Lawrence Ewalt Woodman
Dorwin Clair Wright
Irwin Ira Wright
Joseph Harvey Wright
Alfred H. Zeidler
Harold Parker Wheeler, *Director*

## College Orchestra

Ruth Bainer
Louis Elbert Barber
Louis Hamilton Bock
Walter Halson Boorn
Richard Donald Bradley
Nancy Brenneman
Gerald George Brown
Alex Byron Campbell
Paul Buchanan Cole
Edwin Cutshaw
Harry Emanuel Erickson
Carl Faulconer
Eustace Vivian Floyd
Margaret Foster
Wilbert Fritz
Robert Bruce Gordon
Helen Graham
Ferdinand Haberkorn
Dorothy Hall
Joseph Lowell Hall
Josephine Heath
Lucile Heath
John Maurice Henry
William Illingworth
Mary Jackson
Herbert Kammeyer
Margaret von Leonrod
Harry King Lamont
Olive Mannint
Frances McCoin
Ashley Monahan
Iru Paul Price
Jean Rankin
Aileen Rhodes
Myron Russell
Emma Louise Schoonover
Herbert Henry Schwardt
Howard Dean Skaggs
Roger Cletus Smith
Lucile Stalker
Dorothy Stiles
Charles William Stratton
Fern Lois Straw
Elizabeth Van Ness
Harold Parker Wheeler, *Director*

## Men's Glee Club

Louis Elbert Barber
Donald Brown
Archie William Butcher
Arnold Bernard Cash
Paul Eugene Chappell
Clarence Hart Chase
Ralph Oscar Clark
Orem Richard Clency
Charles Robert Clothier
H. Leslie Evans
Clarence Godfrey
Herbert Albert Goering
Russell Wayne Good
Harold J. Greathouse
Lawrence N. Hedge
William Nelson Hornish
Ralph Taft Howard
Arthur Amos Jackson
George Gray LeVitt
William Joseph Mathias
Wayne E. McKibben
Ansel Miller
Alfred Leo Miller
John Ross Moyer
Robert Harlan Perrill
Russell Reitz
Harold George Rethmeyer
Sheldon Batchelder Storer
Floyd Dewey Strong
Lee Thackrey
Alex Van Pelt
Emil Van Resen
Leo Kenneth Willis
Harry Robert Wilson
Alfred H. Zeidler
Charles Stratton, *Pianist*
Ira Pratt, *Director*

## Male Quartet

Orem Richard Clency
Lawrence N. Hedge
Harry Robert Wilson
Floyd Dewey Strong

## Girls' Glee Club

Elizabeth Allen
Esther Ankeny
Ruth Bainer
Margaret Benfield
Helen Bennett
Blanche Berry
Margaret Corby
Hazel Craft
Lucile Evans
Janet Hellworth
Mary Henry
Marjorie Hubner
Helen Jerard
Mildred Michener
Eleanor Mims
Marjorie Moody
Roma Lucile Nelson
Bernice O'Daniels
Mary Piatt
Mildred Read
Virginia Reeder
Edith Reel
Aileen Rhodes
Madge Rickey
Laura Russell
Mary Russell
Dorothy Sanders
Lucile Simon
Lucile Stalker
Edna Unruh
Lelia Vosburgh
Elsie Wall
Genevieve Wasson
Corrine Wiltrout
Frances Allison, *Pianist*
Edna M. Ellis, *Director*

## Girls' Octet

Esther Ankeny
Ruth Bainer
Hazel Craft
Mildred Michener
Mary Piatt
Madge Rickey
Mary Russell
Corrine Wiltrout
Ruth Faulconer, *Pianist*
Edna M. Ellis, *Director*

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# GENERAL INDEX

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