Velma Broach

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BULLETIN

OF THE

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS

Third Series, Vol 12. APRIL 1, 1926 No. 4

FIFTIETH

ANNUAL CATALOGUE

SESSION 1925-26

WITH ANNOUNCEMENTS FOR 1926-27

SEMI-CENTENNIAL

Published monthly by the Agricultural and Mechanical College of Texas

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I call therefore a complete and generous education that which fits a man to perform justly, skillfully and magnanimously all the offices, both private and public, of peace and war.—*Milton.*

ERRATA

(Fiftieth Annual Catalogue)

The following list of corrections is printed for local distribution and use. Those concerned are requested to enter the corrections in their desk copies.

1. Page 87. In the sophomore electives, transfer Agricultural Economics 102 to the second term.
2. Page 91. In group 10, senior year, for Horticulture 415, 416, increase the practice to 8 hours and reduce the electives by 2 hours each term.
3. Page 96. Sophomore Year: For Horticulture 210, History of Landscape Art, 2-0, read:
   Horticulture 308, History of Landscape Art, 2-0.
   Junior Year: For Horticulture 308, Landscape Design, 0-8, read:
   Horticulture 316, Landscape Design, 0-8.
4. Page 120. For Economics 306, read Economics 403; and for English 306 read English 303.
5. Page 121. For Veterinary Pathology 432, read Veterinary Physiology and Pharmacology 432.
6. Page 125. In the paragraph marked with a double star, strike out the words "up to maximum of 20 term hours," and insert them at the end of the paragraph marked with a single star.
7. Page 132. Under Agricultural Economics 418 strike out "Laboratory fee, $1.50."
8. Page 136. Under Agricultural Engineering 101, 102, change laboratory fee to $1.25.
9. Page 153. Under Chemistry 103, 104, after "$3.50" insert "each term."
10. Page 180. Under Geology 304, add "Laboratory fee, $2.00," and under Geology 311, add, "Laboratory fee, $2.00."
11. Page 214. Under Textile Engineering 413, 414, after "50 cents" insert, "each term."
12. Page 91. For Architecture 402 read Architecture 407.
13. Page 92. For Agricultural Economics 421, 2-4, Farm Management, read Agricultural Economics 312, 2-2, Agricultural Economics.
14. Page 92. For Agricultural Economics 412, Farm Management, read Agricultural Economics 421, Farm Management.
15. Page 108. For Civil Engineering 440 read Municipal and Sanitary Engineering 410.

Semi-Centennial

1876-1926

THE DIRECTORS AND FACULTY

OF THE

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS

Announce the Successful Completion

OF THE

FIFTIETH ANNUAL SESSION

JUNE 1, 1926

Thus Rounding Out a Half Century of Constructive Service in the Development of the Intellectual and Industrial Life of Texas.

The semi-centennial exercises will be held October 14, 15 and 16, 1926.

CONTENTS.

PART I

OFFICERS OF ADMINISTRATION AND OF INSTRUCTION

PART II

GENERAL INFORMATION

PART III

ADMISSION, EXPENSES

PART IV

COURSES OF STUDY

PART V

RESEARCH, EXTENSION, SUMMER SESSION, AND OTHER ACTIVITIES

PART VI

REGISTER

1926

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1928

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COLLEGE CALENDAR

1926

Entrance examinations, September 9, 10, 11.

First term begins Wednesday, September 15.

Registration of new students, September 15.

Registration of old students, September 16.

Registration of graduate students, September 17.

Recitations begin September 17, 8 a. m.

Opening exercises, September 17, 10 a. m.

November 11, observance of Victory Day.

Thanksgiving Day, a holiday.

Christmas holidays begin Wednesday, December 22, at noon.

1927

Christmas holidays end Tuesday, January 4, at reveille.

Recitations resumed, Tuesday, January 4, 8 a. m.

First term ends Friday, January 28.

Second term begins Saturday, January 29.

Registration for second term, January 27, 28, 29.

February 22, observance of Washington's birthday.

March 2, observance of Texas Independence Day.

San Jacinto Day, April 21, a holiday.

Commencement sermon, Sunday, May 29.

Exhibition of departments and of work of students, Monday, May 30.

Commencement Day, Tuesday, May 31.

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H. C. TIDWELL, M. A., *Instructor in Chemistry*
*A. J. WEAVER, M. A., *Instructor in Agricultural Economics*
A. G. WESTERHOFF, B. S., *Instructor in Mechanical Engineering*
O. A. WEINKE. B. S., *Instructor in Agricultural Economics*
C. J. FINNEY, B. S., *Instructor in Architecture*
E. H. GIBBONS, B. S. A., *Instructor in Biology*
C. L. BAKER, *Instructor in Textile Engineering*
J. E. ADAMS, M. S., *Instructor in Biology*
R. E. BAYNE, A. M., *Instructor in English*
J. J. DAVIS, B. S., *Instructor in Drawing*
F. R. DEFOREST, B. S., *Instructor in Agricultural Engineering*
R. B. HARRIS, A. M., *Instructor in English*
W. H. HICKERSON, M. A., *Instructor in English*
F. J. HOSKING, B. S., *Instructor in Agricultural Economics*
F. S. JAMISON, M. S., *Instructor in Horticulture*
E. H. JOHNSON, Ph. M., *Instructor in Agricultural Economics*
J. L. MIZELL, B. S., *Instructor in Agricultudal Economics*
C. E. OLSEN, B. S., *Instructor in Mechanical Engineering*
C. T. SPRAGUE, B. S., *Instructor in Physical Education*
H. B. STENZEL, Ph. D., *Instructor in Geology*
R. STEPHENSON, B. A., *Instructor in English*
R. P. WARD, B. S., *Instructor in Electrical Engineering*
J. J. WOOLKET, M. A., *Instructor in Modern Languages*
A. I. JOHNSON, B. S., M. E., *Instructor in Civil Engineering*

*On leave, 1925-26.

J R. MCKEE, A. B., *Assistant in Mathematics*
E. E. MCQUILLEN, M. S., *Assistant in History*

SUMMARY OF TEACHING STAFF AS OF MARCH 15, 1926

Heads of Departments	33
Other full Professors	31
Associate Professors	40
Assistant Professors	36
Instructors	50
Assistants	2
	192
On Leave	5
	187

THE AGRICULTURAL EXPERIMENT STATION

T. O. WALTON, *President*

STAFF (As of January 1, 1926)

Administration:

B. YOUNGBLOOD, M. S., Ph. D., *Director*
A. B. CONNER, M. S., *Vice-Director*
R. E. KARPER, B. S., *Assistant Director*
A. S. WARE, *Secretary*
W. H. HOLZMANN, *Chief Clerk*
M. P. HOLLEMAN, JR., *Assistant Chief Clerk*
J. M. SCHAEDEL, *Executive Assistant*
C. B. NEBLETTE, *Technical Assistant*

Veterinary Science:

*M. FRANCIS, D. V. M., *Chief*
H. SCHMIDT, D. V. M., *Veterinarian*
V. J. BRAUNER, D. V. M., *Veterinarian*

Chemistry:

G. S. FRAPS, Ph. D., *Chief; State Chemist*
S. E. ASBURY, M. S., *Assistant Chemist*
WALDO H. WALKER, *Assistant Chemist*
J. K. BLUM, B. S., *Assistant Chemist*
J. E. TEAGUE, B. S., *Assistant Chemist*
VELMA GRAHAM, *Assistant Chemist*
ADAH E. PROCTOR, B. S., *Assistant Chemist*
N. J. VOLK, M. S., *Assistant Chemist*
E. C. CARLYLE, B. S., *Assistant Chemist*
R. O. BROOKE, M. S., *Assistant Chemist*

Horticulture:

W. B. LANHAM, M. A., *Chief*
H. NESS, M. S., *Berry Breeder*

Range Animal Husbandry:

J. M. JONES, A. M., *Chief; Sheep and Goat Investigations*
J. L. LUSH, Ph. D., *Animal Husbandman, Breeding Investigations*
J. J. HUNT, *Wood Grader*

Entomology:

F. L. THOMAS, Ph. D., *Chief; State Entomologist*
H. J. REINHARD, B. S., *Entomologist*
C. S. RUDE, M. S., *Chief Foulbrood Inspector*
S. E. MCGREGOR, JR., *Apiary Inspector*

Agronomy:

E. B. REYNOLDS, M. S., *Chief*
A. B. CONNER, M. S., *Agronomist; Grain Sorghum Research*
R. E. KARPER, B. S., *Agronomist; Small Grain Research*
D. T. KILLOUGH, M. S., *Agronomist; Cotton Breeding*
R. H. STANSEL, B. S., *Assistant in Crops*

Plant Pathology and Physiology:

J. J. TAUBENHAUS, Ph. D., *Chief*

Farm and Ranch Economics:

B. YOUNGBLOOD, M. S., Ph. D., *Farm and Ranch Economist*
GLADYS DRAPER LINDSEY, M. S., *Assistant in Farm and Ranch Economics*
V. L. CORY, M. S., *Grazing Research Botanist*
**T. L. GASTON, JR., B. S., *Assistant, Farm Records and Accounts*
**J. N. TATE, B. S., *Assistant, Ranch Records and Accounts*

Soil Survey:

**W. T. CARTER, B. S., *Chief*
H. W. HAWKER, *Soil Surveyor*
E. H. TEMPLIN, B. S., *Soil Surveyor*
T. C. REITCH, B. S., *Soil Surveyor*

Botany:

H. NESS, M. S., *Chief*

Publications:

A. D. JACKSON, *Chief*

Swine Husbandry:

FRED HALE, M. S., *Chief*

Dairy Husbandry:

_____, *Chief*

Poultry Husbandry:

R. M. SHERWOOD, M. S., *Chief*

Main Station Farm:

G. T. MCNESS, *Superinetndent*

Apicultural Research Laboratory:

H. B. PARKS, B. S., *Apiculturist in Charge*
A. H. ALEX, B. S., *Queen Breeding*

Feed Control Service:

F. D. FULLER, M. S., *Chief*
S. D. PEARCE, *Secretary*
J. H. ROGERS, *Feed Inspector*
W. H. WOOD, *Feed Inspector*
K. L. KIRKLAND, B. S., *Feed Inspector*
W. D. NORTHCUTT, JR., *Feed Inspector*
V. C. GLASS, B. S., *Feed Inspector*

SUBSTATIONS

No. 1, Beeville, Bee County:

R. A. HALL, B. S., *Superintendent*

No. 2, Troup, Smith County:

W. S. HOTCHKISS, *Superintendent*

No. 3, Angleton, Brazoria County:

V. E. HAFNER, B. S., *Superintendent*

No. 4, Beaumont, Jefferson County:
R. H. WYCHE, B. S., *Superintendent*

No. 5, Temple, Bell County:
H. E. REA, B. S., *Superintendent*

No. 6, Denton, Denton County:
P. B. DUNKLE, B. S., *Superintendent*

No. 7, Spur, Dickens County:
R. E. DICKSON, B. S., *Superintendent*

No. 8, Lubbock, Lubbock County:
D. L. JONES, *Superintendent*
FRANK GAINES, *Irrigationist and Forest Nurseryman*

No. 9, Balmorhea, Reeves County:
J. J. BAYLES, B. S., *Superintendent*

No. 10, Feeding and Breeding Station, near College Station, Brazos County:
R. M. SHERWOOD, M. S., *Animal Husbandman in Charge of Farm*
L. J. MCCALL, *Farm Superintendent*

No. 11, Nacogdoches, Nacogdoches County:
H. F. MORRIS, M. S., *Superintendent*

****No. 12, Chillicothe, Hardeman County:**
J. R. QUINBY, B. S., *Superintendent*
****J. C. STEPHENS, M. A., *Junior Agronomist***

No. 14, Sonora, Sutton-Edwards Counties:
F. W. THOMAS, B. S., *Superintendent*
D. H. BENNETT, D. V. M., *Veterinarian*
V. L. CORY, M. S., *Grazing Research Botanist*
****O. G. BABCOCK, B. S., *Collaborating Entomologist***
O. L. CARPENTER, *Shepherd*
JACK PATTERSON

No. 15, Welasco, Hidalgo County:
W. H. FRIEND, B. S., *Superintendent*
E. HOBBS, B. S., *Entomologist*

No. 16, Iowa Park, Wichita County:
E. J. WILSON, B. S., *Superintendent*

Teachers in the School of Agriculture Carrying Cooperative Projects on the Station

G. W. ADRIANCE, M. S., *Associate Professor of Horticulture*
S. W. BILSING, Ph. D., *Professor of Entomology*
F. A. BUECHEL, Ph. D., *Professor of Agricultural Economics*
G. P. GROUT, M. S., *Professor of Dairy Husbandry*
V. P. LEE, Ph. D., *Professor of Agricultural Economics*
E. O. POLLOCK, A. M., *Assistant Professor of Agronomy*

*Dean, School of Veterinary Medicine
**In cooperation with U. S. Department of Agriculture

THE ENGINEERING EXPERIMENT STATION

T. O. WALTON, *President*

F. C. BOLTON, *Dean, School of Engineering, Director*

ADVISORY COUNCIL

J. B. BAGLEY, B. A., *Professor of Textile Engineering*

F. B. CLARK, M. A., Ph. D., *Professor of Economics*

E. J. FERMIER, B. S., M. E., *Professor of Mechanical Engineering*

C. C. HEDGES, A. B., Ph. D., *Professor of Chemistry and Chemical Engineering*

J. H. HANCE, Ph. D., *Professor of Geology*

HENRY NORTON JUNE, B. S. in Arch., *Professor of Architecture*

J. J. RICHEY, C. E., *Professor of Civil Engineering*

D. SCOATES, A. E., *Professor of Agricultural Engineering*

O. W. SILVEY, A. M., Ph. D., *Professor of Physics*

E. W. STEEL, C. E., *Professor of Municipal and Sanitary Engineering*

THE EXTENSION SERVICE

T. O. WALTON, *President*
CHARLES H. ALVORD, *Director*
S. C. HOYLE, *Editor*
D. L. WEDDINGTON, *Chief Clerk*

Farm Demonstration Work

H. H. WILLIAMSON, *State Agent*
R. W. PERSONS, *Assistant State Agent*
GEO. W. BARNES, *Beef Cattle Specialist*
M. R. BENTLEY, *Agricultural Engineer*
A. W. BUCHANAN, *District Agent*
G. L. CRAWFORD, *District Agent*
W. H. DARROW, *District Agent*
JOHN R. EDMONDS, *District Agent*
JOHN T. EGAN, *District Agent*
S. C. EVANS, *Boys' Club Agent*
V. R. GLAZENER, *Poultry Husbandman*
GEO. W. JOHNSON, *District Agent*
R. R. LANCASTER, *Rural Organizer*
E. A. MILLER, *Agronomist*
G. W. ORMS, *District Agent*
R. R. REPPERT, *Entomologist*
A. L. SMITH, *District Agent*
J. E. STANFORD, *District Agent*
A. P. SWALLOW, *Horticulturist*
J. LYNN THOMAS, *Dairy Specialist*
A. L. WARD, *Swine Husbandman*
T. B. WOOD, *District Agent*

Home Demonstration Work

MISS MILDRED HORTON, *State Home Demonstration Agent*
MISS BESS EDWARDS, *Assistant State Home Demonstration Agent*
MRS. DORA R. BARNES, *Clothing Specialist*
MRS. MAGGIE W. BARRY, *Special Agent*
MISS LOLA BLAIR, *Home Economics Specialist*
MISS GERTRUDE BLODGETT, *District Home Demonstration Agent*
MISS JENNIE CAMP, *District Home Demonstration Agent*
MISS BENNIE CAMPBELL, *District Home Demonstration Agent*
MRS. BERNICE CLAYTOR, *Home Economics Specialist*
MRS. KATE H. DAUGHERTY, *District Home Demonstration Agent*
MISS MAMIE LEE HAYDEN, *District Home Demonstration Agent*
MISS SALLIE F. HILL, *District Home Demonstration Agent*
MISS MYRTLE MURRAY, *District Home Demonstration Agent*
MISS JUANITA SPROTT, *District Home Demonstration Agent*
MISS HELEN H. SWIFT, *District Home Demonstration Agent*

Negro Extension Work

C. H. WALLER, *State Leader*
H. S. ESTELLE, *District Agent*
MRS. M. E. V. HUNTER, *District Agent*

ADMINISTRATION OF STATE LAWS

Fertilizer Law

G. S. FRAPS, Ph. D., *State Chemist*
S. F. ASBURY, M. S., *Assistant State Chemist*
W. H. WALKER, *Assistant Chemist*
N. J. VOLK, M. S., *Assistant Chemist*

Foul Brood Law

F. L. THOMAS, Ph. D., *State Entomologist*
C. S. RUDE, B. S., *Chief Foulbrood Inspector*
S. E. MCGREGOR, JR., *Foulbrood Inspector*

Forestry Law

E. O. SIECKE, B. A., B. S., *State Forester*
W. E. BOND, M. S. F., *Assistant State Forester*
H F. MUNSON, B. S., *Assistant State Forester*
H. J. EBERLY, B. S., *Assistant State Forester*
J. M. CRAVEY, *Inspector*
J. M. TURNER, *Inspector*
A. L. BEVIL, *Inspector*
E. B. LONG, *Inspector*

Feed Control Law

Administered by the Director of the Agricultural Experiment Station

OTHER MEMBERS OF THE STAFF

S. G. BAILEY, *Executive Secretary to the President, Secretary to the Board of Directors*
Rev. W .H. MATTHEWS, B. A., B. D., *General Secretary, Young Men's Christian Association*
JAMES SULLIVAN, *Business Manager of Athletics*
R. K. CHATHAM, *Manager, Cadet Exchange Store*
G. A. LONG, B. S., *Director, Exhibits and Demonstrations*
MRS. W. H. THOMAS, *Assistant Librarian*
MISS MAMIE RUTH CAMP, B. A., *Assistant Librarian*
MISS IVA WHITTAKER, B. A., *Assistant Librarian*
J. R. MCKEE A. B., *Assistant Secretary, Y. M. C. A.*
V. B. EDGE, *Accountant*
C. C. EDGE, *Cashier*
MISS LOUISE HILLYER, B. A., *Assistant Registrar*
JULIAN R. WRIGHT, *Assistant Commandant*
C. LUKER, B. A., *Assistant Professor of Agricultural Education* (Itinerant)
MISS ELIZABETH T. ALEXANDER, *Library Cataloguer*

FELLOWS AND SCHOLARS

1925-26

Fellows

CLIFTON C. DOAK	*Biology*
OTIS DURANT DUNCAN	*Agricultural Education*
CHAUNCEY B. GODBEY	*Genetics*
ADEN MAGEE	*Animal Husbandry*
VERNER R. SMITHAM	*Civil Engineering*
CLARENCE PERCELL VICKERY	*Agricultural Education*

Scholars

FRANK HOMER MOON	*Horticulture*

Part II

GENERAL INFORMATION

GENERAL INFORMATION

LOCATION

The College is situated at College Station, in the county of Brazos, and is 350 feet above sea level. The Houston & Texas Central and the International-Great Northern Railroads run through the grounds, daily trains stopping at the stations, about 650 yards from the Academic Building. Students and visitors are advised to take trains arriving in day time.

College Station is a money order postoffice. Letters intended for persons at the College should not be directed to Bryan. At College Station there are telegraph and express offices.

HISTORICAL SKETCH

The Agricultural and Mechanical College of Texas, like the land grant institutions in other states of the Union, owes its origin to an act of Congress approved July 2, 1862. This act donated public lands to the several States and Territories which might provide colleges for the benefit of agriculture and the mechanic arts, and directed the Secretary of the Interior to issue land scrip to the States in which there was not the requisite quantity of public land. The act further directed that the money derived from this source should constitute a perpetual fund, the principal of which should remain forever undiminished, and the interest of which should be inviolably appropriated by each State to the endowment, support and maintenance of at least one technological college, whose leading object should be, without excluding other scientific and classical studies, and including military tactics, to teach branches of learning pertaining to agriculture and the mechanic arts, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life. It was further provided that the provisions of the act should be formally accepted by the State Legislature. By joint resolution approved November 1, 1866, the Legislature of Texas accepted the provisions of the congressional legislation, and accordingly there was issued to Texas scrip for 180,000 acres of public land, which was sold for $174,000. This amount was invested in Texas 7 per cent gold frontier bonds. At the time of the opening of the College there was an addition to the fund of accrued interest amounting to $35,000, which was invested in 6 per cent. State bonds.

In an act approved April 17, 1871, the Legislature provided for the establishment of the Agricultural and Mechanical College. A commission to locate the College was created by the Legislature. After careful investigation, the Commission accepted the proposition of the citizens of Brazos county, and located the instiution on a tract of 2416 acres of land in that county. Finally, the constitutional convention of 1876 constituted the College a branch of the University of Texas, and in accordance with the terms of the Federal legislation, designated it as an institution for instruction in agriculture and the mechanic arts and the natural sciences connected therewith. The convention further provided that the Legislature should have the right to levy taxes for the maintenance and support of the Agricultural and Mechanical College.

The College was formally opened for the reception of students October 4, 1876. By means of financial aid voted by Congress and of appropriations

made by the State Legislature, there has been developed a considerable foundation at the College for instruction for investigation, and for extension.

GOVERNMENT

The government of the College is vested in a Board of nine directors, appointed by the Governor for terms of six years.

ADMINISTRATION

The immediate regulation and direction of the affairs of the College are delegated by the Board of Directors to the President and the Faculty.

ORGANIZATION

The College comprises the following divisions:

(1) Resident Teaching.
The School of Agriculture.
The School of Arts and Sciences.
The School of Engineering.
The School of Veterinary Medicine.
The School of Vocational Teaching.
The Graduate School.
The Summer Session.

(2) Research.
The Agricultural Experiment Station.
The Engineering Experiment Station.

(3) Extension.
The Extension Service.

DEPARTMENTS

The College has now in operation thirty-six departments of instruction, which are listed in Part IV under the heading "Courses of Instruction by Departments."

DISCIPLINE

Discipline is administered by the Commandant. The regulations are designed with the view of securing consistent conformity to the following:

General Requirement.—Every student is expected at all times to conform to the ordinary rules of gentlemanly conduct; to be truthful; to respect the rights of others; to be punctual and regular in attendance upon all required exercises; to apply himself diligently to his studies; and to have due regard for the preservation of College property.

Students are not allowed to leave the College grounds, either to visit neighboring towns or their homes, without first securing a furlough from the Commandant. When a student overstays a furlough his name may be dropped from the rolls.

For improper conduct, or failure to keep up with his studies, a student may at any time be required to withdraw from the College.

HAZING

Hazing is forbidden by the law of the State and by College regulations. Every student, upon re-entering the College after his first year, is required to sign

a pledge that he will not engage in hazing while he is a student of the College. These pledges are to be witnessed by the parent or guardian of the student.

RESERVE OFFICERS' TRAINING CORPS

The act of Congress of June 3, 1916, known as the National Defence Act, provides for the establishment in civil educational institutions of units of the Reserve Officers' Training Corps (R. O. T. C.). The object of the Reserve Officers' Training Corps is best stated by the War Department in its Army Regulations No. 145-10 which govern the R. O. T. C., and is as follows:

Object.—The primary object of the Reserve Officers' Training Corps is to provide systematic military training at civil educational institutions for the purpose of qualifying selected students of such institutions for appointment as reserve officers in the military forces of the United States; the Reserve Officers' Training Corps is, therefore, an important agency in making effective the plan for national defense.

Although the primary object of the Reserve Officers' Training Corps is, as stated above, to produce trained offiecrs for the Officers' Reserve Corps, it is recognized that the basic military training received by the students, who for various reasons fail to complete their qualification course for the Officers' Reserve Corps, is of considerable military value to the Government.

Educational Aim.—The Reserve Officers' Training Corps will add to the educational resources of schools and colleges and will give to the student a training which will be as valuable to him in his industrial or professional career as it would be should the Nation call upon him to act as a leader in its defensive forces.

MILITARY ORGANIZATION

All military instruction is under the immeriate charge of the Professor of Military Science and Tactics. The officers of the Cadet Corps are selected from the Senior class, non-commissioned officers from the Junior and Sophomore classes.

The cadet corps consist of units in the Infantry, Field Artillery, Aviation, Signal Corps and Cavalry branches of the service. The instruction is divided into Basic and Advanced Courses. When entered upon, these courses become prerequisite to graduation, and carry credits corresponding to other college work.

BASIC COURSE

All students of this institution who are physically fit, are required to take this course unless excused by the Faculty for one of the following reasons:

(a) A minimum of six months' service in the Army, Navy, or Marine Corps during the World War.

(b) Completion of the Basic Course in an advanced unit elsewhere.

(c) Mature men entering College with advanced standing in a considerable number of subjects may, for reasons satisfactory to the Faculty, be exempted.

With the exception of those who enter with junior or senior standing, students who are exempted from the basic course in Military Science must substitute for it other work amounting to six term hours.

Obligations.—Members of the Basic Course are not obligated further than to

pursue the course diligently and properly to care for the equipment and apparatus used in the instruction.

Benefits.—Each student will be furnished commutation of uniform, which at the present time amounts to $30 the first year and $6 the second year, provided that amount has been expended for uniform, at the College Exchange Store.

ADVANCED COURSE

In order to continue in the R. O. T. C. for the advanced course, i. e., during the Junior and Senior years, a student must be selected by the president of the institution and the Professor of Military Science and Tactics and he must obligate himself to attend the advanced course camp as prescribed by the Secretary of War. This course, including the prescribed camp training, when entered upon, becomes a prerequisite to graduation.

Obligations.—The student obligates himself:

a. To pursue the course while at the College.

b. To attend the advanced course camp.

c. To take proper care of the equipment furnished him.

4. He is expected, though not bound, to accept a commission in the Officers' Reserve Corps if offered one, unless prevented by unusual conditions.

Benefits.—a. He will receive commutation of uniforms at the rate of $30.00 for the first year and $6 for the second year.

b. He will be furnished subsistence now allowed at 30 cents per day from the beginning of his Junior year to the end of his Senior year, excepting during camp when he is given rations in kind. Commutations of rations will not be paid for more than two years.

c. While at camp he will receive 70 cents per day, and will also receive transportation to and from the camp.

d. After graduation he may be eligible for appointment as officer in the Reserve Corps.

e. Honor graduates are eligible for appointment as second lieutenants, U. S. Army, with only the physical examination necessary.

f. Graduates may be given opportunities to take competitive examinations for Regular Army commission.

Eligibility for Different Branches of the Service.—All students entering the College as Freshmen are eligible to enroll in the Infantry, Field Artillery, or Cavalry. All Freshmen enrolling for the four-year electrical engineering course or who have had the equivalent training prior to entering College are eligible to enroll in the Signal Corps unit. All Freshmen enrolling for a four-year course in civil engineering, mechanical engineering, chemical engineering, electrical engineerng are eligible for enrollment in the Air Service provided they submit at date of registration a letter signed by parent or guardian authorizing their enrollment in the Air Service unit.

WITHDRAWAL FROM THE R. O. T. C.

For satisfactory reasons, upon recommendation of the Professor of Military Science and Tactics, the authorities of the institution may discharge members of the R. O. T. C. from such corps and from the necessity of completing the course in military traning as a prequisite to graduation, except in cases involving withdrawal from the advanced course contract.

METHOD AND SCOPE OF INSTRUCTION

In all courses the fundamental idea is education in the applications of science to the affairs of life. With this idea in view, instruction is given in English, history, economics, mathematics, physics, chemistry and in other studies which lie at the foundation of a sound education and furnish the best preparation for the more technical studies of the several courses. Instruction is given by the use of text-books, by lectures and recitations, and by practice in the shop, field, laboratory, and drawing room.

These practical exercises have a high educational value, and serve a useful purpose in fixing and rendering clear the ideas presented in the class room; they have also a practical value; for they are, in great measure, examples of just such problems as the graduate will encounter in the pursuit of his calling. For convenience of instruction, the classes are subdivided into sections of suitable size' Unannounced written exercises and tests are given at the discretion of instructors. Written examinations are held at the end of each term.

NON-RESIDENT LECTURES

At intervals throughout the session, men who have attained prominence in some branch of agriculture or engineering or in other fields are invited to address the students with the view of enabling them to see more closely the relation between their college instruction and the work they will be called upon to do after they enter upon their professional careers.

TRIPS OF INSPECTION

At suitable times during the session trips of inspection, under the direction of some member of the teaching staff, are made to points of special interest. These trips have a high instructional value, and students of the upper classes are encouraged, though not required, to take them.

ELECTIVE STUDIES

Elective studies are to be chosen by the student under the advice and direction of a member of the Faculty designated for the purpose, and subject to schedule. The choice of electives for any year must be made by April 15 of the preceding year. In case of failure to comply with this requirement, the student will be subject to an assessment of one dollar, and his advisor will be authorized to assign subjects for his electives. The Faculty may withdraw any elective course unless it is elected by at least five students.

ABSENCES

When a student is absent from recitation a considerable number of times, his absences are taken into account in making up his term grade, unless the work missed is satisfactorily made up before the time set for the examination.

PETITIONS FOR CHANGES IN STUDIES

Petitions for substitutions, for change of course, or for other changes affecting the student's list of studies, must be submitted at least one week before the first day of the term. For making changes asked for at a later date there will be a charge of one dollar.

REPORTS

In order to keep parents systematically informed concerning the progress of

their sons, reports showing class standing are sent out at the end of each term. A preliminary report is sent out soon after December 1.

HEALTH

The College buildings are situated on the crest of a wide divide, with sufficient slope in every direction to insure proper drainage. The health of the student body, as shown by the daily records of the institution, is all that could be expected.

The hospital is a modern brick building, with steam heat, hot and cold shower baths, a capacity of sixty-five beds, and is equipped with operating room, x-ray and laboratory facilities. There is a staff of one full time physician and four nurses.

Sanitary work is carried on throughout the entire year by a full time man, with especial reference to the eradication of mosquitos, flies, and other disease-bearing agencies.

Drinking water is supplied by wells varying in depth from 300 to1300 feet. The milk supply for the College is obtained mainly from two College dairies which use tested cows, and the most modern methods of handling their dairy products. Bacterial examinations of both milk and water are made twice monthly, in order to detect any contamination. or disease producing organisms which might be present.

The barracks are inspected daily and are kept neat and clean throughout. The rooms are well lighted and comfortable.

Drill, shops, field practice work, and outdoor athletic sports, furnish sufficient and varied exercise, and contribute very much to the maintenance of health and proper development.

ATHLETICS

The usual forms of athletic sports are encouraged. The College is a member of the Southwest Athletic Conference. The general rules of eligibility of this organization have been adopted by the Faculty. The Faculty Committee on Athletics is entrusted with the general oversight of athletics.

ATHLETIC TRIPS

For the purpose of attendance upon intercollegiate athletic contests, one trip by the student body will be authorized each year. Individual furloughs for that purpose are not granted to students in their first year of college attendance. Other students may be granted one such furlough each term provided they have in their last term of attendance passed in two-thirds of a normal term's work and have earned at least eight grade points, and provided further that they have the written consent of parent or guardian addressed to the Commandant.

BAND

An attractive feature is a regularly organized cadet band of about one hundred pieces. Under the direction of a leader employed by the College, it furnishes music for occasions of social and military importance, gives open-air concerts in season, leads the corps in marching to dinner, and plays at dress parade. Prospective students who play any band instrument should communicate with Mr. R. J. Dunn, Leader, with reference to membership in this organization.

RELIGIOUS AND MORAL CULTURE

There is religious service in the chapel every Sunday for the Corps of cadets and the residents of the campus. A Sunday school for Bible study, attendance at which is voluntary, affords additional help in the way of ethical training. Every effort is made through lecture and personal example to develop and protect good morals in the young men attending the institution.

YOUNG MEN'S CHRISTIAN ASSOCIATION

The Young Men's Christian Association occupies a handsome building in which ample provision is made for the meetings of the Association, for Bible study, for social gatherings, and for games. In the basement there is a well appointed swimming pool.

THE LIBRARY

The Library contains approximately 20,000 volumes, including over 5,000 bound public documents; exclusive of the files of the Federal and State Agricultural Bulletins. While the Library has hitherto been modelled chiefly along reference lines a very good reading Library has now been accumulated, and the careful selection of new books keeps the collection abreast of contemporary thought. With the exception of books of general reference, current periodicals, and books temporarily reserved by certain departments for required reading, all books are loaned for home use for a period of two weeks, with the privilege of renewal for the same lengh of time.

The Library receives about two hundred standard magazines, reviews and technical journals besides the leading newspapers of the State, and some journals of national importance. Files are kept of some of the most important of these periodicals.

The Library is a United States designated depository and receives copies of all Federal publications. A card index is maintained of all publications of the United States Department of Agriculture and of the State Experiment Stations.

The Library is open on week days and holidays from 8 a. m. to 12 m., from 1 p. m. to 5 p. m.,and from 7 p. m. to 10:00 p. m. The Sunday hours are from 2 to 5 p. m.

PUBLICATIONS

The following publications are issued by the College:

The Bulletin of the Agricultural and Mechanical College of Texas.—This is a monthly publication which includes the bulletins of the Texas Engineering Experiment Station, the Catalogue of the College, and the announcement of the Summer Session.

The Daily Bulletin.—This is a small sheet issued daily during the regular session, which carries official notices and other announcements.

Bulletins of the Agricultural Experiment Station.—These bulletins are issued from time to time and contain reports of the results of the investigations of the Station.

The Texas Aggie.—The object of this publication is to keep the alumni informed as to the progress and activities of the College.

Extension Service Bulletins.—The Extension Service publishes from time to time bulletins on subjects of popular interest in the fields of agriculture and home economics.

In addition, there are issued twice a month an *Extension Service News Letter* of seasonal advice, and numerous circulars from time to time covering both matters of general agricultural interest and matters of unexpected development.

Student Publications.—The students of the College publish *The Battalion,* a weekly devoted to student activities, and interests. The Senior Class publishes an annual, *The Longhorn.*

The Young Men's Christian Association publishes at the opening of the session a *Handbook* giving information of value particularly to new students.

EXPULSIONS

At a joint session of the Board of Regents of the University of Texas and the Board of Directors of the Agricultural and Mechanical College, held at College Station, Texas, from June 30 to July 1, 1896, the following order was made:

"It is ordered that hereafter, when any student shall be dismissed or expelled from either of the branches of the University of Texas on account of any immoral or other conduct which shall render him an unfit character to be matriculated in any of such branches, it shall thereupon be the duty of the branch so expelling or dismissing such student to immediately notify the other branches of their action, whereupon such other branches shall refuse to receive such student for matriculation, or even for examination, should he apply therefor, until the branch which has so expelled or dismissed him has rescinded or reconsidered its former action, and recommended such student for admission into such other branch at which he may apply."

DEGREES OFFERED

For resident study the College offers the degrees of Bachelor of Arts, Bachelor of Science, and Master of Science. In addition, the professional degrees in engineering, Chemical Engineer, Civil Engineer, Electrical Engineer, Mechanical Engineer, are offered on the basis of acceptable proffesional experience.

The requirements for each of these degrees are stated on subsequent pages.

GRADUATION

A diploma of the College, with the degree corresponding to the course of study pursued, will be granted students who satisfactorily complete the requirements for graduation in one of the regular courses.

For students entering during the session 1922-23 and thereafter, the grade point system will be in effect. Under this system one of the requirements for graduation is that the student must earn each year a specified minimum number of grade points. To do this it will be necessary for him to get a grade above C in approximately one-half of his studies.

No degree will be conferred without a residence of at least one year at the College. The diploma fee is $7.50.

The fee for certificates in two-year courses is $1.00.

HONORS

At the end of each session, students who have failed in no subject and who have accumulated a total of at least sixty grade points during the session shall be designated as "Distinguished."

CADET EXCHANGE—BOOKS AND OTHER SUPPLIES

The College runs an exchange store for the purpose of supplying necessary articles to students at the lowest possible cost. The store carries in stock textbooks, stationery, drawing instruments, regulation articles of the uniform, toilet articles, etc. These goods are sold at prices just sufficient to cover the cost and operating expenses.

STUDENT LABOR

The Legislature provides a fund by which a limited number of industrious young men may defray a part of their expenses by working for the College at such times as their regular duties will permit.

The rate of pay is made to depend upon the character of the work, and the manner in which it is performed. A student should not count upon earning more than $40 a session.

TEACHER'S APPOINTMENT SERVICE

The Teachers' Appointment Service, under the direction of the School of Vocational Teaching, endeavors to assist graduates and students of the College who desire to teach in securing suitable positions, and to assist boards of education and other school officials in securing teachers. While no one is assured of a position, every reasonable effort will be made to place all worthy candidates registered for this service. Information obtained from professors and others is kept confidential. No charge is made for this service. Applicants should address the Dean of the School of Vocational Teaching.

CHANGES IN ANNOUNCEMENTS

The announcements made in this Catalogue are based upon present conditions, and are subject to change without notice.

BUILDINGS

The physical plant of the College includes the buildings described below and a number of smaller structures, with a total valuation of approximately $3,000,000.00.

The Academic Building, erected in 1914, contains the administrative offices of the College and provides class room, laboratory and office space for several college departments.

Bernard Sbisa Hall, erected in 1912, contains a dining room seating about 2000 students, together with a modern kitchen, cold-storage, etc. It is named in honor of Bernard Sbisa.

Aggieland Inn, erected in 1925, designed as a hotel for the use of guests of the College; contains 36 sleeping rooms with baths, large dining room, and separate cafeteria with kitchen and service equipment.

The Young Men's Christian Association Building, erected in 1914, contains offices, auditorium, lobby, social rooms, bed rooms, swimming pool, locker rooms and billiard parlor.

Guion Hall, erected in 1918, contains a modern college auditorium seating 960 on the main floor and 940 in the balcony. It is named in honor of Judge John I. Guion.

The Assembly Hall, erected in 1923, contains an auditorium seating two thousand persons, and an ample stage, dressing rooms, and other accessories.

The Hospital, erected in 1916, contains ample accommodations for the needs of the College, including modern equipment and conveniences.

The Exchange Store, erected in 1925, contains two large sales rooms and store rooms on the second floor to accommodate the business of the supply store of the college.

The Memorial Gymnasium. erected in 1924. Primarily designed to house basketball courts as well as offices for the athletic staff and coaches; ample locker, shower-bath, and other facilities for all field sports; lecture rooms, retiring rooms; examination rooms; apparatus rooms, and heating plant. The basketball section has a seating capacity of about three thousand.

The Power Plant, erected in 1917, provides heat, light, and ice for College purposes.

The Chemistry Building, erected in 1902, contains offices, class rooms and completely equipped laboratories for the department of Chemistry and Chemical Engineering.

The Military Science Building, erected in 1920, contains offices and class rooms for instruction in Military Science and Tactics.

The Physics Building, erected in 1920,, contains offices, class rooms, lecture rooms, and completely equipped laboratories.

The Agricultural Building, erected in 1922, contains administrative offices for the School of Agriculture, and offices, class rooms, and labortories for various agricultural departments.

The Agricultural Engineering Building, contains offices, class rooms and laboratories for the study of gas engines. tractors and farm machinery.

The Animal Husbandry Building, erected in 1916, contains a large display

area surrounded by concrete seats seating 1600 spectators; also, offices and class rooms.

The Dairy Barns, erected in 1916, contains milking rooms with stalls for 98 cows, cooling, and separating rooms, etc.

The Dairy Judging Building, erected in 1923, contains a large area for judging stock as well as offices and class rooms.

The Science Building, erected in 1899, used until 1922 as the Agricultural Building. Remodeled in 1924 and now used for Biology, Geology, and Entomology. The building contains offices, laboratories. and class rooms serving the needs of these Departments.

The Civil Engineering Building, erected in 1909, contains offices, class rooms, drafting rooms and laboratories.

The Electrical Engineering Building, erected in 1912, contains offices, class rooms, drafting rooms and laboratories.

The Mechanical Engineering Building, erected in 1919, contains offices, class rooms, drafting rooms and labortories.

The Mechanical Engineering Shops Building, erected in 1922, contains a comprehensive layout of the following shop units—carpentry, pattern making machine forge and foundry.

The Textile Engineering Building, erected in 1904, contains offices, carding and spinning, warp-preparation machinery, weaving, cloth finishing machinery, designing and class rooms.

The Veterinary Hospital, erected in 1908, contains clinic rooms, stalls, dog rooms, feed rooms, medicine rooms, etc.

Francis Hall, erected in 1918, contains offices, class rooms and laboratories for the School of Veterinary Medicine. It is named in honor of Dr. Mark Francis.

The Serum Laboratory, erected in 1917, provides for the manufature of hog cholera serum and contains preparation, killing, bleeding, defibernating and laboratory rooms.

The Research Chemistry Building, erected in 1909, is ocupied by the divisions of Chemistry, Entomology, Plant Pathology, and Physiology of the Texas Experiment Station.

The Research Administration Building, erected in 1918, contains administrative offices and labortories for the research divisions of the Texas Experiment Station.

The Extension Service Building, erected in 1924, contains administrative offices, library and mailing rooms for the agricultural extension work.

DORMITORIES

All dormitories are screened, well ventilated and provided with sanitary conveniences.

Gathright Hall, erected in 1876; named in honor of Thomas L. Gathright, the first president of the College.

Pfeuffer Hall, erected in 1887; named in honor of George Pfeuffer, a former president of the Board of Directors.

Austin Hall, erected in 1888; named in honor of Stephen F. Austin.

Ross Hall, erected in 1892; named in honor of L. S. Ross, a former president of the College.

Foster Hall, erected in 1899; named in honor of L. L. Foster, a former president of the College.

Goodwin Hall, erected in 1908; named in honor of Hon. G. I. Goodwin.

Milner Hall, erected in 1911; named in honor of R. T. Milner, a former president of the College.

Legett Hall, erected in 1911; named in honor of K. K. Legett, a former president of the Board of Directors.

Mitchell Hall, erected in 1912; named in honor of Harvey Mitchell.

Bizzell Hall, erected in 1912; named in honor of W. B. Bizzell, a former President of the College.

Alpha Hall, a frame building, converted into and used as a dormitory.

Beta Hall, a frame building, converted into and used as a dormitory.

The Cottage Group, erected in 1923; contains one hundred frame cottages housing two or three students each.

The Graduate Hall, erected in 1925, for the use of students of the Graduate School, as a dormitory and containing 32 sleeping and study rooms.

SEWERAGE SYSTEM

The College is provided with a system of sewers to which are connected the buildings of the campus. The outfall of the system is three-fourths of a mile from the nearest College building and nine-tenths of a mile from the nearest recitation hall or dormitory.

GROUNDS AND GARDEN

The garden, orchard, barnyards and campus are included in the inclosure east of the railroad stations. The campus consists of some twenty-five acres of, lawn, shrubbery and flowers. The orchard, vineyard, nursery and garden are located north and east of the Academic Building.

FARM

The farm proper comprises about three hundred and fifty acres, and has the necessary barns, silos, and outhouses. The pastures contain about one thousand acres and furnish grazing for the College herds.

EQUIPMENT

AGRICULTURAL ECONOMICS

The department of agricultural economics has well equipped laboratories for statistics, accounting, farm management, and agricultural economics. Adding machines, calculators, Fuller slide rules, and drawing tables constitute a portion of the equipment. The department has accumulated a valuable working library which is open to students.

AGRICULTURAL ENGINEERING

The agricultural engineering department has special laboratories for each of the following subjects: Farm machinery, farm motors, farm shops, automobiles, tractors, farm home utilities and concrete construction. In addition to this there is a drawing room for use of classes in farm buildings, irrigation and drainage. A hundred-acre farm is provided for practical work in the various subjects.

The farm machinery and tractor laboratories are housed in a building 160x100 feet, which is entirely taken up with up-to-date farm machinery and tractors, such as should be used on Texas farms. The machinery consists of different makes of plows, harrows, planters, cultivators, harvesters, threshers, seed cleaners and grinders.

The farm motor laboratory contains twenty-five farm gas engines, together with all apparatus necessary for testing same, and a supply of extra magnetos and carburetors.

The automobile and truck laboratory contains—thirty four six, eight and twelve cylinder motors, six automobiles, two trucks, a number of chassis, soldering and babbitting room, acetylene welding outfit, special ignition apparatus, storage battery charging and repair outfit, and a number of surplus magnetos and carburetors.

The concrete construction laboratory is equipped with cement and aggregate testing apparatus, together with molds and forms for making such simple concrete structures as are found on the farm.

The farm home utilities laboratory contains a number of isolated electric light plants with their various accessories, home water supply systems and other equipment needed in the farm home.

The farm shop laboratory is well supplied with tools and equipment necessary for the teaching of this subject.

Equipment for special field work in terracing, drainage and irrigation has been provided.

AGRONOMY

The agronomy department has three well equipped laboratories. Two of these are used for instructional purposes in soils, and one for instructional purposes in farm crops.

The main soils laboratory is equipped with a centrifuge, shaking machine, Briggs filter, electric air pump, torsion balances, chemical balances, drying ovens, hot plates, compound microscopes, evaporimeters, soil capillary tubes, soil samplers and all the smaller equipment and chemicals for a modern soils laboratory.

The soil fertility laboratory is equipped for specialized instruction in soils for the benefit of senior students who desire to specialize in this subject, and for graduate instruction in soils.

For soil survey instruction, the department has five plane tables equipped with alidades; also other miscellaneous equipment for this work.

The farm crops laboratory is equipped for general laboratory instruction in farm crops and also for specialized instruction in commercial grain grading. For the general laboratory study of farm crops the chief items of equipment are standard seed testers, dissecting sets, hand lenses, torsion balances, insect-proof and rat-proof grain bins. Also type samples and specimens of all the important field and forage crops are kept in stock for study. For the work in grain grading the chief items of equipment are two Brown-Duvel moisture testers, a Wild-oat kicker, several complete sets of dockage sieves for determining dockage in the various kinds,classes and grades of grain for practice work in determining the grades.

The department has a modern greenhouse, 67x25 feet, equipped for soil fertility, farm crops and plant-breeding work. For field study the department has 35 acres of land devoted to demonstration and experimental work in crops and soils. All of the important types and varieties of farm crops adapted to this section are grown for field study.

The department maintains a rather complete technical library, in which will be found practically all of the standard works and journals pertaining to agronomy, as well as the Experiment Station bulletins and reports.

ANIMAL HUSBANDRY

The animal husbandry department is equipped with the following breeds of live stock: Standard Bred, Thorough Bred, Morgan and Percheron horses; Shorthorn, Hereford, Aberdeen-Angus, and Brahman cattle; Shropshire, Hampshire, Southdown, Rambouillet and Corrodale sheep, Angora goats; and Duroc-Jersey, Poland-China, Hampshire, and Tamworth hogs. These breeds are represented by registered breeding animals in the case of horses, and both registered breeding animals and market animals—steers, wethers, and barrows— in the case of cattle, sheep and hogs, respectively.

On the Animal Husbandry farm there are four barns, viz., a horse barn, a beef cattle barn, a sheep barn, and a hog barn. The land on which the hogs and sheep are kept is divided into small fields and pastures, thus permitting forage crops and pasturage rotation for these animals.

ARCHITECTURE

The department comprises a large drafting room where students of the several classes work together, two small drafting rooms for special drafting classes, a well lighted large art room for cast drawing and art instruction, a library and lecture room. These rooms are furnished with adequate drafting tables and lockers, a large number of casts of architectural units and sculpture, a very complete collection of building materials and samples, a collection of library reference books and plates, a projection lantern and large screen wall for lectures with an adequate collection of lecture slides and plates upon architectural history and the history of art. The department subscribes to about sixteen archi-

tectural magazines, among which are French and English standard publications. All this equipment is being increased as the needs of the department demand. Students of Architecture also have access to the equipment of the other departments whose work is associated with Architecture.

BIOLOGY

The department in its various branches is thoroughly equipped with apparatus for lecture room and for laboratory use. There are eight laboratories—one zoological, four botanical, one bacterioligical and two research. All are amply provided with tables and other general apparatus.

For the use of elementry classes, the department is provided with 60 standard 2-power microscopes, with their usual accessories; charts and models of plants and animals; a fairly good collection of prepared specimens, and a herbarium of about 3000 mounted plants. For experimental work and demonstration in the class room, there is an excellent equipment of instruments of precision largely of French and German make. For use of more advanced workers there are 20 high-power microscopes of the best makes;3 Leitz binocular dissecting microscopes; Reickert and Minot microtomes; imbedding ovens; a large and a small incubator; two steam sterilizers; analytical balances; and a fullequipment of glassware, chemicals, stains and similar materials.

The library contains about 300 books of reference and several thousand separates, bulletins and special papers. The leading journals of botany, zoology, bacteriology, and mycology are also available to the student.

CHEMISTRY AND CHEMICAL ENGINEERING

The department has the usual laboratory facilities, including a vacuum system for rapid filtration, a compressed-air system for use with blast lamps, and a ventilating system. The laboratories are supplied with hydrant, cistern and distilled water. Each student is assigned to a lock-desk containing the necessary equipment. The large lecture room, with raised seats, has a seating capacity of one hundred and sixty.

There is a separate room for technical analysis and one for advanced industrial chemistry. The former is provided with vacuum and compressed-air systems, colorimeters, calorimeters, refractometers, Levibond tinometer, combustion furnaces, gas burettes, and other special apparatus used in technical analysis. The laboratory has the usual equipment for work in physical chemistry.

The department has a good reference library.

CIVIL ENGINEERING

The equipment in the civil engineering department provides for adequate laboratory instruction and practice in surveying, hydraulics, testing of engineering materials, and in office work such as drafting and designing.

For the work in surveying there is a good supply of transits, levels, planetables, compasses, and the smaller instruments used in such work.

The hydraulics laboratory contains water meters, meter testing apparatus, impulse wheels, weirs, weighing tanks, centrifugal pumps, hydraulic ram, current meters, and other instruments for hydraulic tests and measurements.

The laboratory for testing engineering materials such as steel, wood, cement,

etc., contains one universal testing machine of 100,000 pounds capacity, one of 50,000 pounds and one of 20,000 pounds. There is also one torsion machine having a capacity of 50,000 inch pounds. For testing cement and sand, there are the usual briquette molds, tension machines, and other apparatus for making tests of fineness, soundness, and other properties of cement.

The road materials laboratory is well equipped with apparatus for testing both bituminous and non-bituminous highway materials. For non-bituminous materials there are a diamond core drill, diamond saw, Dorry hardness machine, Page impact machine, Deval abrasion machine and other similar equipment. For the testing of bituminous materials and pavement samples the department is especially well equipped, having practically all of the standard apparatus for such tests.

In addition to laboratory and drafting room facilities there is a well furnished library of books and periodicals on civil engineering and related subjects. This library is in the Civil Engineering Building and is available for the use of students as well as instructors.

DAIRY HUSBANDRY

The department controls a complete dairy farm of 593 acres of land, the operations of which are devoted to the growing of feed crops, and the preparation and maintenance of permanent pastures for the dairy herd. Two hundred and twenty-five acres under cultivation, the remainder being devoted to pasturage.

Modern machinery is used by this department, including breaking plows, cultivators, and harvesting machinery.

The herd consists of 161 animals, including cows, calves and bulls, of which there are 84 pure-bred Jerseys, 53 pure-bred Holsteins, 9 pure-bred Ayreshires, 5 pure-bred Guernseys, 3 pure-bred Dutch Belted, and one pure-bred Red Poll. The milking herd usually includes about 80 cows, which are housed in a modern dairy barn constructed of tile and concrete, and furnished completely with modern barn equipment.

The dairy manufacturing equipment is housed in a new tele-stucco building. Equipment and machinery necessary for the manufacture of butter and ice cream is available, including a modern six ton York refrigerating unit; glass lined mixing vat; motor drive homogenizer; motor drive horizontal brine freezer; power churn, and sterilizer.

DRAWING

This department is located on the fourth floor of the Academic Building. It occupies three large drawing rooms, two recitation rooms, offices, etc., all of which are especially well venilated, heated and lighted.

The department is fully equipped with necessary furniture, models, etc.

For illustrative purposes there is in use in the department all modern apparatus for the draftsman, such as electric blue printing machine, universal drafting machine, pantograph, ellipsograph, etc.

A reference library of the best works on drafting, illustrating, etc. is kept in the department for the convenience and use of students.

ELECTRICAL ENGINEERING

The electrical engineering labaratories comprise three electrical machinery laboratories, a measurements laboratory, a standardizing laboratory, a photometric laboratory, a storage battery room, a storage battery repair room, a communication laboratory for the telephone, telegraph and radio work, a work shop, two rooms for building and repairing electrical machinery, and an instrument room.

The electrical laboratories are supplied with 2300 volt, three phase, 60 cycle power from the College power station. Alternating current at 110 and 220 volts is obtained through transformers. Direct current is supplied by two motor-generator sets located in the machinery laboratory. The small set consists of a 2300-volt, 50-horse power induction motor direct connected to a 35 kw., 125-volt, compound wound direct current generator. The larger set consists of a 2300-volt, 100-horse power synchronous motor direct connected to two 35kw., 250-volt, Dobrowolsky, three-wire direct current generators, so arranged that they may be operated independently or connected in series for obtaining 500 volts. A three panel switchboard controls the above equipment and the feeders to the 6-panel switchboard used for the distribution of power within the machinery laboratories and to the switchboards located in the other laboratories. Throughout all laboratories the distribution of power is controlled by a plug-and-socket system thus securing absolute flexibility.

The equipment of the machinery laboratories is as follows: Two street car motors mounted on a single shaft with prony brake attachment, and equipped with both a hand controller and a master controller operating an electro-pnuematic system, twenty-eight dirrect-current machines ranging in size from 1½ horse-power to 20 kilowatts and provided with various means of speed and voltage control; eight alternators ranging from 2½ K. V. A. to 30 K. V. A.; three converters including one of the split pole type; a number of induction motors including practically all standard types; a number of constant voltage transformers; a constant current transformer; induction regulators; and several types of automatic motor starters.

The laboratories are provided with a total of more than 200 voltmeters, ammeters, wattmeters, and meters for measuring other electrical quantities.

The high tension laboratory contains a 100 K. V. A. 200,000-volt transformer, with regulator for varying the voltage, a 125 cm. spark gap, a crest voltmeter with a number of auxiliary devices.

The electrical measurements laboratory has a full equipment of the apparatus needed for the study of the fundamentals of electrical measurements. The equipment includes the following: Various types of Wheatstone bridges; a Kelvin double bridge; a Cary-Foster bridge; magnetometers, dynamometers; portable, semi-portable and wall galvanometers; astatic galvanometers; universal tangent galvanometer; calorimeters; sechometer; influence machine; electrostatic apparatus; spark coils; apparatus for testing magnetic qualities of iron and steel; standard resistances; standard cells; physical balances; universal shunts; resistance boxes; variable inductances and capacities; portable storage batteries, and various minor equipment.

The standardizing room is equipped with a Leeds and Northrup potentiometer and its accessories; Weston standard laboratory voltmeter, and milli-

voltmeter with shunts; a Kelvin balance; Westinghouse precision ammeter, voltmeter, and wattmeter; and standard resistances and standard cells. In this room there are also a three-vibrator oscillagraph with photographic attachment. and a motor generator set consisting of direct current motor direct connected to a set of four alternators giving a fundamental wave, and the third, fifth and seventh harmonies, so arranged that any desired phase relation may be obtained between each of the harmonies and the fundamental.

The photometric laboratory has several well arranged dark rooms suitable for various kinds of photometric work. They are equipped with Lummer-Brodhum and flicker photometers which can be used to measure the distribution of light from any angle, an Ulbricht sphere, a Taylor reflectometer, and an assortment of portable photometers making possible complete tests of illuminants and illumination.

The equipment of the communication laboratories consisting of both manual and automatic telephone switchboards and accessories has been augmented by the admission of a variable oscillator, a 250-mile artificial transmission line and an assortment of delicate measuring instruments, the gift of the Bell Telephone System. The laboratories contain a complete assortment of radio telephone and telegraph equipment including wave meter, decremeters and various types and sizes of vacuum tubes. The College operates a 500 watt broadcasting station from which regular programs are sent out. This station is available for use of instruction also.

The College manitains a complete power plant to furnish power, lights, water, heat, ice and refrigeration, and both this and the motors which operate the machinery of the various departments are available for study and test by the students.

Students are encouraged to read the literature pertaining to their professions, and the latest books on electrical engineering and a selected list of the best technical magazines are kept in the department library and are available for reading and reference work.

ENTOMOLOGY

The department of entomology maintains two laboratories one of which is equipped with dissecting and compound microscopes, and the other with compound microscopes. In addition, the department maintains an insecticide laboratory equipped with the more important insecticides and spray machines, powder guns, etc.

The department has several insect models illustrating the antomy of the more common insects, together with a series of charts illustrating the life histories of insects. This equipment is supplemented by a baloptican and several hundred lantern slides illustrating the anatomy and life history of the most important insects.

The equipment in apiculture consists of a bee house and workshop containing honey extractors, wax presses, wiring device and different makes of beehives. In addition to this the department has a small apiary, where the student can familiarize himself with the practical operations of bee-keeping.

For life history work, the department has an insectory equipped with breeding cages, a hydrothermograph, and all necessary equippment for working out the life histories of insects.

A library is maintained which comprises two hundred and eighty volumes of technical books on entomology. This library contains full sets of the Transactions of the American Entomology Society, Genera Insectorum, Journal of the New York Entomological Society, Entomological News, The Canadian Entomologist, and Psyche.

In addition, a reading table is maintained, on which are kept the recent publications on economic entomology and apiculture.

GEOLOGY

The department of geology is the recipient of several valuable donations which are highly prized additions to its other material. A complete set of government maps and topographic sheets and a fairly complete set of geologic folios besides most of the reports of the United States Geological Survey are available for reference and class room work. In addition to the mineral and rock collections which the department has purchased, there is is the donation of Mr. F. W. Steber of Dallas, a collection which includes a variety of ore and rock specimens. Several oil companies have contributed pieces of drilling equipment such as rock bits, wrenches, fishing tools, strainers, valves, a steel oil tank, etc. Other gifts include well cuttings and cores, lead, zinc, iron and sulphur ores. Laboratory facilities are being extended as rapidly as possible so as to make this material available for student use.

HORTICULTURE

The class-room work in horticulture is considerably strenghened by practical exercises in orchards, gardens, and laboratory.

There are now growing on the horticultural grounds consisting of 60 acres, orchards containing the standard varieties of peaches, pears, plums, pecans, persimmons, grapes, figs, blackberries and dewberries.

In addition to the commercial gardens, where vegetables are grown for use at the Mess Hall, a plat of ground has been set aside on which a great variety of vegetables are grown under the direct supervision of the student.

There is maintained in co-operation with the American Rose Society, a rose garden, which, when completed, will contain about eight hundred varieties. There is also to be found on the horticultural grounds a rather complete collection of ornamentals.

The department has ample equipment for the control of insects and diseases, including various types of sprayers.

The collection of lantern slides owned by the department which are used for illustrating different subjects. including those in landscape art, vegetable gardening and nut culture, is growing rapidly, there being now over twelve hundred.

For work in plant propagation, in forcing early vegetables and in plant breeding, and in floriculture, the students have the use of one of the finest greenhouses to be found in the Southwest. In addition. the department has an excellent greenhouse on the horticultural farm and modern laboratories and cold storage facilities in the agricultural building

In the carpenter shop are excellent work benches of special design, equipped with quick-acting vises, and the tools ordinarily found in a carpenter's kit, each student having a set of edged tools assigned to him alone. Supplementing these are a number of special tools in the tool room, also power driven wood working machines.

The pattern shop equipment consists of pattern maker's benches, equipped with vises, drawers, lockers and an outfit of hand tools; and in addition there is an assortment of special tools in the tool room, as well as anumber of small turning lathes, pattern maker's lathes, circular saw, band saw, jointers, grinder, sander, wood trimmers etc.

The foundry is equipped with bench molding stands, with all necessary shovels, riddles and small tools, a number of floor molding kits, flasks of all kinds, a core machine, a core oven, a squeezer, a Combs gyratory riddle, a brass furnace with all necessary accessories, a No. 1 Whiting cupola with electric-driven blower for blast, and a Clark blast meter for measuring the amount of air supplied. The other accessories for the cupola, a tumbling barrel and a grinder are also included.

The forge room equipment consists of one electric power hammer, emery wheels, forty new forges, all having power blast and exhaust, the necessary anvils, tongs, and other small tools usually found in a forge shop.

In the machine shop the equipment is very satisfactory. It consists of a full line of lathes, grinders, milling machines, automatic machines, planers, shapers, etc., many having individual motor drives.

The tool room contains a large assortment of taps, dies, drills reamers, chucks, and other machine accessories, as well as the small tools for laying out work and accurately and properly measuring the same; calipers, micrometers, steel scales, punches, surface plates. Electric portable drills and grinder are also included in the equipment.

The engineering laboratory contains steam engines, gasoline engines, steam turbines, steam and power pumps, fans, water motors, a hot-air engine, condensers, air pump, injectors, and a full line of indicators, gauges, pyrometers, thermometers, tachometers, speed indicators, weirs, pitot tubes, prony brakes, platform scales, etc., for conducting tests, as outlined in course 403, 404. A recent addition to the equipment is a testing rack for internal combustion motors, an automobile testing floor; a locomotive air compressor; also a semi-Diesel oil engine made avaliable through the courtesy of the San Antonio Machine and Supply Company.

In addition, the laboratory has the use of all apparatus of the power plant, consisting of simple and compound engines, steamturbines, condensers, pumps of several different kinds; also the boilers of well known makes and different types with automatic stokers. The equipment of the steam plant makes available larger engines, condensers, air compressors, air lift pumps, etc., for instruction and test purposes.

For the class-room instruction there are numerous full-size wooden and metal models of different kinds of engines, also sections of actual air-brake equip-

ment and other appliances and fittings for railway and power plant equipment.

Besides the above mentioned equipment, might be mentioned the fact that manufacturers have in some instances deposited or donated for the use of the department a number of standard appliances which prove valuable to the student.

MILITARY SCIENCE AND TACTICS

The department has full equipment for Infantry, Field Artillery, Signal Corps, Cavalry, and Air Service, as follows:

Infantry.—The infantry is equipped with rifles, pistols, machine guns, automatic rifles, one-pounder guns, trench mortars, hand and rifle grenades, gallery rifles, infantry packs, ammunition for all arms, and field engineering tools. Besides these arms and equipment, the infantry has facilities at hand to use all of its equipment, including an indoor gallery range and a 1,000-yard outdoor rifle range.

Field Artillery.—One 75 mm. battery complete, consisting of four 75 mm. guns, 8 caissons, 10 limbers, 2 battery and store wagons, 2 store limbers, battery reel cart, 90 horses, 4 mules, harness and saddle equipment for all horses, and all accessories, spare parts and tools; also included in the equipment are one 4.7-inch rifle with limber and caisson, one .155 mm. Howitzer with limber and caisson, one 155 mm. rifle with limber and one each of the American, and British 75 mm. guns with limbers and caissons; one ordnance repair truck, complete; four motorcycles with side cars; two 5-ton caterpillar tractors; 2 F. W. D. ammunition trucks, one White reconnaissance car. The artillery equipment also includes four Browning machine guns, four automatic rifles and a complete supply of fire control instruments, such as B. C. telescopes, range finders, aiming circles, trench periscopes, prismatic compasses, sitogoniometers ,and an assorted supply of smaller instruments, including drawing instruments, slide rules for field artillery computations, compasses and stop watches.

Cavalry.—Sixty sets of cavalry equipment, consisting of saddle, saddle blanket, bridle, saddle bags, rifle scabbard, lariats, picket pins, sabres, sabre scabbard, feed bags, grain bag, halter and halter tie rope. Two pack outfits complete, consisting of aparejo, corona, manta, lair sling and lash ropes; 60 cavalry horses; 2 pack mules; 4 draft mules; 1 wagon escort; harness.

Air Service.—One airplane and accessories; 1 Liberty motor, complete; one Wright motor (Hispano Suiza), complete; 1 rotary motor, complete; tools for overhauling motors and repair of airplanes; machine guns, aerial, 3 types; aerial machine gun sights; bombing sights; dummy drop bombs; radio sets, ground and airplane; airplane instruments; airplane propellers, airplane radiators, magnetos, carburetors.

Signal Corps.—Radio telephones; radio telegraph; damped and undamped military telephones; automatic telephones and switch board; storage batteries and charging plant for automatic telephones; service buzzers; buzzer-phones; T. P. S. (Telegraphic par sol) ground radio; Kellogg cross section open commercial switchboard; commercial telegraph sets; printing machine; repeaters; horse-drawn wire carts; motorcycles; trucks; tools and equipment for instruction in cable splicing; heliograph; flags, projectors; mechanical tools of all kinds for

repairing technical equipment; literature and books for conducting technical courses in signal corps work.

PHYSICS

The main lecture room of the Physics Building has a seating capacity of 250. It is equipped with amphitheater seats, motor-driven blinds for darkening the room, and with a large lecture table provided with gas, water, and an electrical switchboard. The blinds and lights of the room are controlled from the switchboard.

A smaller lecture room, having a seating capacity of 50, contains a lecture table equipped with water, gas, and a switchboard. Both of these lecture rooms are in direct communication with the preparation room.

The apparatus room of the first floor is equipped with a five-panel switchboard supplied with 110 and 220-volt, alternating current from the College power system, and with 110 and 220-volt direct current from a 20 kw. motor-generator in the basement. By a plug-and-socket system either alternating or direct current can be distributed by individual lines to any part of the laboratories and to the lecture rooms.

One of the two laboratories of the first floor contains sixteen tables, each supplied with water, sink and gas. It contains also tables for sensitive balances. The other laboratory, designed for electrical measurements, is provided with numerous well distributed outlets for separate electrical lines to the switchboard.

The shop, also on the first floor, is equipped with a motor-driven planer, lathe, rip saw and drill press; stock material and the usual metal and wood-working tools.

The basement consists of one general laboratory, ten smaller laboratories for special work, and equipment room for the motor-generator, a storage battery room, a general store-room and a store-room for chemicals.

In the two larger laboratories are fourteen tables mounted on masonry piers which are free from the floor. These tables may be used either for general practice or for special work. Each table is supplied with gas and a separate electrical line to the switchboard.

Two of the smaller laboratories are black and suitable for photometric work. Another 40x20 feet is suitable for general experiments in light.

RURAL SOCIOLOGY

The department has an extensive library of State and Federal reports and bulletins, together with clipping files and books giving accounts of various forms of social work. It also has a number of maps and charts illustrating in a graphic manner many questions connected with community organization and development. Apparatus for working out the laboratory problems peculiar to this field are available.

Connections have been established by the department for giving the students practical contact with local and State social problems ,especially in the field of community organization.

TEXTILE ENGINEERING

For yarn manufacture there is ample equipment necessary to produce carded or combed yarns, and with it machines for making chain or sized warps of either single or double yarns.

In the weaving room there are fourteen Northrop looms, and one Stafford loom, which are entirely automatic, and two plain looms for ordinary plain goods. There are two dobby looms, with box motion, to insert four colors for filling; one dobby loom for terry towels; one dress goods loom, with dobby and boxes for making seven-colored pattern; one loom for weaving narrow Jacquard dress goods, one Jacquard loom for weaving table covers and one for fancy towels.

The finishing machinery is for ordinary ducks, sheetings or drills, and consists of an inspecting machine, railway sewing and rolling machine, folder and bale press.

VETERINARY ANATOMY

The laboratory of anatomy has a number of mounted and unmounted skeletons of the domestic animals, and about twelve sets of disarticulated skulls. There are a number of preparations of muscles and ligaments, both dry and wet specimens. There are also preparations of the brain, eye, feet and other organs preserved in formalin and a number of charts and papier-mache models. There are the usual miscroscopes, microtomes, embedding apparatus, stains, reagents, and apparatus used in histology and embryology, and five sets of sections showing the embryology of the chick and the pig.

VETERINARY MEDICINE AND SURGERY

The class-room work, practice and clinics are largely conducted at the Veterinary Hospital, which has a large operating room equipped with operating tables for large and small animals, stocks, casting harness, and instruments for operations and treatment of diseases of live stock. A dispensary which is stocked with necessary drugs and biologics is maintained. Facilities for keeping records of each case are provided; and when complete the records are stored in fireproof vaults for future reference. There are wards for sick dogs and other small animals. Provision is made for isolation of animals with infectious diseases and transmissible skin diseases.

A large barn, 50x120 feet, is used for keeping horses, mules, cattle, sheep and goats which are being treated. There are also several other barns and small houses used for isolating animals. After animals are in condition that they do not need daily attention, they are turned in a large pasture to permit occasional treatment and observation until complete recovery takes place.

The serum laboratory offers an unusual opportunity for students to become familiar with the preparation of anti-hog cholera serum, autogenous bacterins and other biologics.

Ambulance service for large and small animals is available; also automobiles for transporting students to see cases that cannot be brought to the College.

A post-mortem building with skylights, sanitary floor, hoisting apparatus, and other equipment where post-mortem examinaion is made on all animals that die in the clinics and many dead animals from Bryan and the surrounding country.

A slaughter house with sanitary floor, overhead tracks, hoisting apparatus, scalding vat, meat blocks and cold storage for teaching the slaughtering, cutting, curing and inspection of meat and meat products.

VETERINARY PATHOLOGY

The department is located on the third floor of Francis Hall and has the usual equipment found in laboratories where pathology, bacteriology, and allied subjects are taught.

In connection with the department a pathological museum containing preserved specimens of various disease processes and parasites is maintained.

VETERINARY PHYSIOLOGY AND PHARMACOLOGY

The Physiology laboratory is well equipped with apparatus, reagents, chemicals, etc., for the proper instruction in pathological chemistry, experimental physiology, urine, blood, milk, and gastric analysis, and for producing graphic records of the physiological processes of the body.

The pharmacy and experimental pharmacology laboratory is equipped with the apparatus, reagents, chemicals, etc., essential for a thorough training in the preparation of all the official and the more common proprietary medicinal preparations, and for experimental work in the determination of the action of drugs on the living body. It also includes the necessary apparatus for the examination of arsenic, lime-sulphur, and other dips which are commonly used.

The toxicology department is equipped with all the apparatus, drugs, chemicals, experimental animals, etc., essential to the proper study of the action of inorganic and organic poisons, and poisonous plants on the living animal, their detection and the treatment for them.

The apparatus consist of the necessary glassware, mortars, pill tiles, hot water funnels, torsion and laboratory balances, kymographs, pneumographs, plethysmograph tubes, ergographs, tambours, manometers, muscle levers, cardic levers, saccharometers, urinometers, uremeters, indicanometers, hydrometers, electric centrifuge, electric water bath (for digestion experiments), respiratory and circulatory schemes, microscopes, spectroscope, drug mill, steam mill, suppository machine and mold, tablet machine, triturate tablet molds and all other necessary equipment. The department also cultivates a garden of medicinal and poisonous plants, which are used in the above courses.

THE SCHOOL OF VOCATIONAL TEACHING

The School of Vocaional Teaching occupies six rooms on the third floor of the Academic Building. The classroom for agricultural students is equipped with movable tables and chairs, slide and film projectors, etc., to serve as an example of a good type for high school departments of agriculture. The Visual Instruction laboratory is equipped with mimeograph, mimeoscope, charting board, photograph reducing and enlarging apparatus, motion picture rewind, projection and motion picture machines and cabinets for lantern slides.

The A. and M. Consolidated School, located on the College Campus, affords excellent opportunity for observation and directed teaching. This project in school consolidation and transportation of pupils at public expense, provides exceptional facilities for the study of current problems in school administration and management.

Part III

ADMISSION, EXPENSES

ADMISSION

All communications in regard to admission should be addressed to the Registrar, Agricultural and Mechanical College of Texas, College Station, Texas.

GENERAL REQUIREMENTS

The candidate for admission to the College must be of good moral character, at least sixteen years of age, and physically able to perform the duties of a cadet. He must be free from contagious or infectious disease and must present a satisfactory certificate of recent vaccination against smallpox and typhoid-paratyphoid fever, or be vaccinated against both upon entering the College.

SCHOLARSHIP REQUIREMENTS FOR ADMISSION

1. *Admission by Certificate.*—Graduation from an accredited secondary school, with a minimum of fifteen approved units, is required for admission by certificate. Three units of English, two units of algebra and one unit of plane geometry must be presented by all candidates; the remaining nine units must be offered from the subjects included in List B, below.

No credit is granted for work done in an accredited school unless the candidate is a graduate of the school.

It is of the highest importance that credentials be submitted in advance. If this cannot be done, the candidate should bring them at the opening of the session. Without the credentials he cannot be admitted, and valuable time will be lost if he has to send for them after reaching College Station.

Blanks for submitting credentials may be obtained upon application to the Registrar.

Subjects and Units Accepted for Admission

LIST A. PRESCRIBED UNITS

English	3 units
Algebra	2 units
Plane Geometry	1 unit

LIST B. ELECTIVE UNITS

English (4th unit) ..... 1 unit
Mathematics:
Solid Geometry ..... ½ unit
Trigonometry ..... ½ unit
Advanced Arithmetic ..... ½ unit
Social Sciences:
Ancient History ..... 1 unit
Modern History ..... 1 unit
Eng. History ..... ½ or 1 unit
Amer. History ..... ½ or 1 unit
Civics ..... ½ or 1 unit
Economics ..... ½ unit
Foreign Languages:
Latin ..... 2 to 4 units
French ..... 2 to 4 units
German ..... 2 to 4 units
Spanish ..... 2 to 4 units

Natural Sciences:
Biology ..... 1 unit
Botany ..... 1 unit
Chemistry ..... 1 unit
General Science ..... 1 unit
Physics ..... 1 unit
Physiography ..... ½ unit
Physiology ..... ½ or 1 unit
Zoology ..... 1 unit
*Vocational Subjects:
Agriculture ..... 1 to 4 units
Bookkeeping ..... 1 unit
Drawing ..... 1 to 4 units
Com. Arithmetic ..... ½ unit
Com. Law ..... ½ unit
Com. Geography ..... ½ unit
Manual Training ..... 1 to 4 units
Stenography and Typewriting ..... 1 unit
Pub. Speaking ..... ½ or 1 unit

***Not more than 4 units of Vocational work will be accepted for admission.**

Special Requirement for Engineering Students.—In the School of Engineering students not presenting solid geometry for entrance will be required to make up that subject before the beginning of the Sophomore year.

Students planning to enter the School of Engineering are urged to complete solid geometry in high school. A thorough course in high schools physics is strongly recommended for all students.

2. *Admission by Examination.*—Any or all of the scholarship requirements may be met by passing the entrance examinations.

The spring entrance examinations are held throughout the State in May, under the supervision of the State Department of Education. These examinations are conducted in each county by responsible school officials and the papers are sent to the State Department of Education to be graded. On the basis of these papers uniform Entrance Certificates are issued, which will be accepted for admission to any Texas College, provided the subjects certified cover the entrance requirements of the college to which application for admission is made. Under this system students are allowed to take examinations at the close of each high school year, in the subjects studied during that year, so that at the end of three of four years of high school work they should have from ten to fifteeen entrance credits. This method of admission should appeal particularly to students from non-accredited high schools. Further information regarding the spring entrance examinations may be obtained from the State Department of Education, Austin.

Fall entrance examinations will be held at the College September 9, 10, and 11, 1926, under the supervision of the College authorities, and will cover all the subjects required or accepted for admission as outlined above.

SCHEDULE OF FALL ENTRANCE EXAMINATIONS, 1926

Note: Acceptable laboratory note books must be presented in connection with the examinations in science subjects.

Hour	September 9	September 10	September 11
8-10	Algebra, Agriculture, Sociology	Plane Geometry, Physiography	Solid Geometry, Trigonometry, Drawing
10-12	Botany, English, Manual Training	Physics, Latin, Stenography and Typewriting	American History, Bookkeeping, Com. Arith.
1-3	Ancient History, Physiology	Modern History, Biology, Psychology	English History, General Science, Com. Law
3-5	Civics, Chemistry, Public Speaking	French, Adv. Arithmetic, Economics	German, Spanish, Zoology, Com. Geog.

3. *Admission by Individual Approval.*—A candidate over twenty-one years of age, who has not recently attended school and who cannot satisfy the entrance requirements in full, may be admitted to the Freshman class without examination, subject to the following requirements:

(1) He must make application on the official entrance blank.

(2) He must furnish evidence that his preparation is substantially equivalent to that required of other applicants, and that he possesses the ability and seriousness of purpose necessary to pursue his studies with profit to himself and to the satisfaction of the College.

(3) He must show, by a test in composition, that he has an adequate command of the English language.

The candidate should forward his credentials to the Registrar in advance of his coming, but in no case will he be admitted without a personal interview.

A student admitted by individual approval will not be considered a candidate for a degree until he has satisfied the entrance requirements in full.

ADMISSION TO ADVANCED STANDING

Admission to advanced standing may be granted under the following conditions:

(1) The candidate must present a letter of honorable dismissal from the institution last attended.

(2) An official transcript of the record of all previous high school and college work must be submitted, together with a marked catalogue showing the college courses referred to in the transcript.

On the basis of these credentials credit will be given so far as the work previously completed is equivalent in character and extent to subjects included in the course of study pursued here. Credits given by transfer are provisional and may be cancelled at any time if the student's work in the College is unsatisfactory.

It is essential that all credentials be forwarded to the Registrar in advance.

College credit for work done in secondary schools will be given only on the basis of examinations at the College, and shall not include work presented in satisfaction of the intrance requirements.

ADMISSION OF SPECIAL STUDENTS

At the discretion of the Dean of the College, a limited number of young men over twenty-one years of age may be admitted to the College as special students, not candidates for a degree, subject to the following regulations:

1. The candidate must show good reason for not taking a regular course, and must submit satisfactory evidence that he is prepared to profit by the special studies he wishes to pursue.

2. A record of his preparatory work must be submitted on the official entrance blank, and must be accompanied by a statement showing (a) his experience; (b) a plan of study, enumerating the courses he desires to pursue; and (c) the purpose or end expected to be accomplished by his study.

3. In order to be admitted to the work of any department, a special student must secure the consent of the head of the department; and his course of study, as a whole, must be approved by the Dean of the College.

Special students are subject to the rules and regulations governing regular students, and are required to take the prescribed military traning.

A special student who may desire to become a candidate for a degree must satisfy the entrance requirements and obtain the consent of the Dean of the College.

ADMISSION TO THE COLLEGIATE TWO-YEAR COURSES

The College offers the following Collegiate Two-year Courses:

Two-year Course in Textile Engineering, page 76.

Two-year Course in Cotton Marketing and Classing, page 76.

The requirements for admission to these courses are the same as for the regular four-year courses.

ADMISSION TO THE NON-COLLEGIATE TWO-YEAR COURSE IN AGRICULTURE

A candidate for admission to the Two-year Course in Agriculture, page ___ must be eighteen years of age, except in the case of a graduate of a non-accredited school, who may be admitted at the age of sixteen years. He must satisfy the general requirements in regard to health, character ,and vaccination, and must present a certificate showing the satisfactory completion of the tenth grade of a classified school, or its equivalent.

The Two-year Course in Agriculture is not open to candidates who are qualified to enter a four-year course.

ADMISSION AT THE BEGINNING OF THE SECOND TERM

For the benefit of students admitted at the beginning of the second term, certain first term subjects are repeated. By completing these subjects, and by attending the summer session for twelve weeks ,the student should be able to graduate with his class. For those who are unable to attend the summer session, it is inadvisable to enter at the beginning of the second term.

REGISTRATION

Upon arrival at the College young men intending to enter will report at once at the Academic Building for full information in regard to registration.

SESSION

The session begins on the third Wednesday in September and extends through thirty-seven weeks.

Wednesday and Thursday, September 15 and 16, will be devoted to the registration of new and old students respectively. Recitations will begin Friday, September 17.

EXPENSES

REGISTRATION FEE

Every student is required to register when he first enters the College and thereafter at the beginning of each term.

Upon registering for the first time he is charged a reistration fee of five dollars. He pays this fee only once unless his connection with the College should later be severed; in that case he must pay the registration fee again in order to reenter.

LATE REGISTRATION

All students except those registering for the first time who do not complete their registration on the days set for that purpose will be charged a fee of five dollars for late registration.

In the case of irregular and special students, registration is not complete until their assignment cards are returned, properly signed, to the Registrar.

EXPENSES FOR THE SESSION

The fixed charges are as follows:

Incidental fee, payable on entrance	$ 12.00	
Medical fee, payable on entrance	10.00	
Student activities fee	15.00	
Maintenance fee, first term, payable on entrance	125.00	
Key deposit, payable on entrance	1.00	
Post Office box rent	.50	
		$163.50
Freshmen pay in addition:		
Registration fee		5.00
Second term maintenance fee, payable the first day of the second term		125.00
Students will bring one piece of *exchange, money order or cash, equal to the exact amount of the fee to be paid and a second piece of exchange* for their other expenses as listed below:		
Books, from $15 to	$ 25.00	
Laboratory fees, averaging about	10.00	
For Freshmen Engineering Courses:		
Drawing instruments, about	15.00	

Breakage Deposit.—In certain laboratory courses the student is required to make a deposit to cover breakage and damage to equipment. The amount of the deposit, less charges for breakage and damage, is returned to the student.

Notes.—A limited number of students, needing financial assistance, may make notes with the College for part of their maintenance. Application blanks for such loans may be obtained from the Fiscal Department, and must be properly filled out and returned to the President's Office 30 days before opening of the session 1926-27.

Personal checks will not be accepted.

Payment for each term must be made in advance. A student entering during a term will be charged maintenance only for the remainder of that term.

Deductions.—No deductions will be made for entrance within 15 days after

the opening of a term, nor will there be any refunds for the last 15 days of a term or the last 15 days paid for.

Incidental Fee.—The incidental fee is used for sundry incidental expenses, such as printed forms, examination books, etc.

Medical Fee.—The medical fee covers the professional services of the College Surgeon and the hospital staff. Surgical operations and charges for consultations with outside physicians requested by parents are not included in the medical fee. For students entering at the beginning of the second term, the medical fee is one-half the medical fee shown above.

Student Activities Fee.—The student activities fee is for the support of student activities, and by a practically unanimous vote of the student body this fee has been fixed at $15. This fee is paid at registration along with other fees, but it is not compulsory. A student entering after the Christmas holidays will pay only $9.25. On payment of this fee a student is entitled to be admitted to all intercollegiate and inter-scholastic contests held at College Station, to receive a copy of the Lognhorn, the college annual, and one annual subscription to the Battalion, the student college publication, throughout the scholastic year.

No Refund.—Incidental, medical, and registration fees will in no case be refunded.

Maintenance Fee.—Maintenance includes board, fuel, laundry, light, room rent, single bedsteads, mattress, tables, washstands, chairs. Each student is required to keep on hand a supply of bed clothing for single bed, towels, etc.

Laboratory Fees.—The laboratory fees cover in part the cost of materials used by the student in his laboratory work. The total amount of these fees varies according to the classification of the student. The fees for the several courses are listed under "Courses of Instruction by Departments." They are payable during registration at the beginning of each term.

Forfeiture on Withdrawal.—Refund of maintenance will be made only in case the student is required to withdraw by Faculty action or in case of sickness disqualifying him for the discharge of his duties for the rest of the term. When such sickness takes place at the College, it must be attested by the College Surgeon before the student can receive the refund of the unused portion of his maintenance fee.

Graduate Students.—A graduate student who is not a member of the College staff pays the registration fee, the incidental fee, the medical fee, the maintenance fee and the laboratory fees as listed above.

Members of the College Staff.—Members of the College staff are permitted to register for not more than one-fourth of a full term's work, whether graduate or undergraduate. They pay the registration fee, the laboratory fees and an incidental fee of $2.50.

Day Students.—Day students pay the registration fee, the incidental fee and the medical fee as listed above.

Deposits.—Deposits may be made with the Fiscal Department. Depositors will draw their money by giving receipt direct to the Fiscal Department as money is required. Deposits and withdrawals must be given in even dollars.

Checks.—A graduated collection fee will be charged on all out of town

collections, except bank exchange, postal money orders and express money orders. Checks or drafts that have been altered in any way will not be accepted.

Unpaid Checks.—If a check or draft accepted by the Fiscal Department as cash is returned unpaid by the bank on which it is drawn, the party presenting it will be required to pay a penalty of $1.00. If this penalty and the amount of the check are not paid within seven days after notice is sent from the Fiscal Department further service will be withheld from the person not complying with this regulation.

Duplicate receipts.—A fee of fifty cents will be charged for duplicate receipts.

UNIFORM

Attention is called to the following regulations issued by the Secretary of War with reference to the commutation of uniforms:

> "Institutions authorized to draw the commutation will provide the uniforms for the students, crediting the student's account with the amount of commutation allowed, and charging the said account the cost of uniform furnished, and when they have been delivered, fitted and given to the students, vouchers, War Department form No. 330, will be duly accomplished . . . ."

Cadets should have in their posession the following articles of uniform:

1 college regulation woolen uniform, complete.
1 extra pair woolen breeches.
1 cap with ornaments.
1 regulation hat.
1 silk hat cord.
3 regulation o. d. shirts at least one of which is woolen.
1 soft white shirt with collar attached.
1 Sam Browne belt.
1 pair spiral leggins, for mounted branches, mounted canvas leggins instead.
1 pair russet service shoes.
1 regulation waist belt.
1 set collar ornaments for shirt.
1 set collar ornaments and lapel ornaments for coat.
4 R. O. T. C. shields with pipings the color of branch of service.
1 regulation black tie.
1 blue star.
1 suit unionalls.

All articles of uniform must meet the approval of the Professor of Military Science and Tactics. The above articles must be purchased from the Exchange Store at a cost of about $85.00 insuring approval by the Professor of Military Science and Tactics as regulation. In order to refund to the students of the first and third years the thirty dollars from the United States government, the College must furnish to the student thirty dollars worth of uniform equipment, preferably a complete woolen uniform. Students who do not buy at least thirty dollars worth of equipment from the College Store cannot receive a refund from the United States Government.

It is not contemplated that all the above mentioned articles must be purchased each year. Uniform dress is more economical than civilian dress if proper care is taken of the clothing and articles left over from the first year may be used as long as serviceable, by upper classmen.

Part IV

COURSES OF STUDY

COURSES OF STUDY

There are sixteen regular courses, extending through four years; fourteen of them lead to the degree of Bachelor of Science, the particular course being specified in the diploma; the course in Liberal Arts leads to the degree of Bachelor of Arts; the course in Veterinary Medicine leads to the degree of Doctor of Veterinary Medicine; and there are graduate courses and short courses as shown below.

REGULAR FOUR-YEAR COURSES

I.—Course in Agriculture.
III.—Course in Mechanical Engineering.
IV.—Course in Civil Engineering.
V.—Course in Electrical Engineering.
VI.—Course in Textile Engineering
VIII.—Course in Chemical Engineering.
IX.—Course in Architecture.
X.—Course in Science.
XI.—Course in Veterinary Medicine.
XII.—Course in Agricultural Education.
XIII.—Course in Industrial Education.
XIV.—Course in Agricultural Administration.
XV.—Course in Agricultural Engineering.
XVI.—Course in Rural Education.
XIX.—Course in Liberal Arts.
XX.—Course in Landscape Art.

REGULAR SIX-YEAR COURSE

XXI.—Course in Agriculture and Veterinary Medicine.

GRADUATE COURSES

Courses of study leading to the degree of Master of Science are offered in: Agricultural Administration, Agricultural Education, Agricultural Engineering, Agriculture, Architecture, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Education, Mechanical Engineering, Rural Education, Science, Veterinary Medicine.

TWO-YEAR COURSES

(C)—Course in Agriculture (Non-Collegiate)
XVII.—Course in Textile Engineering.
XVIII.—Course in Cotton Marketing and Classing.

THE SCHOOL OF AGRICULTURE

In the School of Agriculture there are offered the following courses:

REGULAR FOUR-YEAR COURSES

Course in Agriculture.
Course in Agricultural Administration.
Course in Agricultural Engineering.
Course in Landscape Art.

TWO-YEAR COURSE

Two-year Course in Agriculture.

COURSE IN AGRICULTURE

The regular four-year course has as its main object the preparation of young men for the business of farming, for the pursuit of scientific investigation along some line of agriculture, for becoming county demonstration agents, or extension workers, for specialists in Landscape Art and for teaching in the high schools and agricultural colleges. It also affords excellent preparation for young men who intend to follow business pursuits, especially for merchants and bankers. Systematic training is given in the sciences of biology, chemistry, entomology and geology, which are fundamental to the study of scientific agriculture, and in technical subjects, covering the main divisions of agriculture, including agricultural engineering, agronomy, animal husbandry, dairy husbandry, farm management, horticulture, poultry husbandry, and rural sociology. As shown in the curriculum, the work in the Junior and Senior years is arranged so as to provide for a choice by the student of one of nine groups of studies. This arrangement affords the student a wide range of subjects from which to choose his major work, permitting him to specialize in agricultural education, agricultural engineering, agronomy, animal husbandry, dairy husbandry, horticulture, landscape art, poultry husbandry, or in rural sociology.

COURSE IN AGRICULTURAL ADMINISTRATION

The course in Agricultural Administration stresses the business side of agriculture rather than the technological side, although the latter is not neglected.

The central aim of the course is to prepare men to become agricultural economists in the broad sense of the term. This involves a much broader concept of agriculture than has hitherto been generally held. It involves the concept that farmers will become associated in powerful business organizations carrying on their commercial operations in accordance with fundamental principles that have been approved in other lines of industry.

The factors that promote the economic efficiency of the individual farms are given careful consideration as the farmsteads are the pillars upon which the great business superstructure of agriculture must gradually be built. Economical growing of plant and animal products upon the individual farms must ever be an indispensible prerequisite to successful farmer business organizations.

Such sciences as statistics and accounting are used as tools to bring the great mass of world data pertaining to agriculture into such form that they

may be analyzed and interpreted. It is because the problems relating to the economics of agriculture require exact measurement, or as we say, quantitive treatment, that so much use is made of mathematics, accountancy, and statistics in the course in Agricultural Administration.

Men who have finished this course will be well equipped to enter general business such as banker or merchant, etc.; to administer landed estates, large or small; to enter the Civil Service in the field of marketing, statistics, etc.; to become managers of a business, either private or co-operative; to serve as agricultural advisers in chambers of commerce, corporations, including railroads; to serve as County Agents; and as instructors and research students in economics and commercial subjects.

It should perhaps be emphasized that there is at present a great need for business men who have a thorough understanding of both the economic and technical side of agriculture. This is especially true of a state like Texas, wrich is so predominantly agricultural. Much of the misunderstanding that now exists between rural and urban communities will be dispelled when men who have taken this course, with the broad vision it inculcates, become distributed as business men and leaders all over the State.

COURSE IN AGRICULTURAL ENGINEERING

The course in Agricultural Engineering is designed to give the student an engineering training with an agricultural viewpoint. A thorough grounding in fundamental engineering principles is given, as much time is devoted to purely agricultural subjects as possible, and the application of engineering to agriculture receives its share of attention.

The need of such engineers is being felt more and more each year as the demand grows for farms to be better equipped with power machinery, farm buildings and home conveniences and more land to be reclaimed by drainage, irrigation and clearing.

Graduates of this course are prepared for service in the following lines: with the colleges and government in teaching, extension and experiment station work; with manufacturers of farm machinery, gas engines, tractors, other farm equipment and farm buildings, in advertising, sales and designing work; with engineering and contracting firms doing irrigation work and drainage work; and with farm and trade journals.

COURSE IN LANDSCAPE ART

The purpose of this course is to train students in the development of outdoor areas, such as flower gardens, both formal and informal, large and small estates, parks and playgrounds, cemeteries and the surroundings of buildings, private and semi- public, and public. The object of the landscape designer is to create not only beautiful compositions, but to plan, direct and carry to completion problems that will satisfy the esthetic taste and in addition be fundamentally practicable.

In order to perform this work properly, the student should have some knowledge of the basic sciences and in addition a considerable amount of architecture, horticulture and civil engineering. It is not necessary that he be equally proficient in all phases of Landscape Art, as the work is sufficiently

broad to enable men of diverse talents to select and follow some particular subdivision of the work. Students whose primary qualification is a talent for drawing become designers, others are more interested in the horticultural side and become superintendent of planting, still others may prefer landscape construction or one of the many divisions of civic improvement. Extension landscape work, superintendents of large parks or cemeteries, members of city park boards or Park Commissioners are some of the other fields open to graduates in this group. In addition the United States Department of Agriculture now employs Landscape Architects, the positions being filled under Civil Service Rules.

While the student can, with the training he receives at the College, begin practice immediately after graduation, an apprentice course under a competent Landscape Architect or actual work in a good nursery, or both, will be found of great value. The students are urged to spend some considerable part of their summer vacations in some related field, thus gaining technical knowledge and experience while still in college, and thereby shortening or eliminating entirely an apprentice course after graduation.

TWO YEAR COURSE IN AGRICULTURE

This course is intended for young men who wish to spend one or two years in preparing to go back to the farm and apply the more important scientific methods of farming which have been worked out in recent years. To this end the course is made highly practical and includes much of the technical work required in the four-year course. In the first year, the studies are nearly all prescribed; in the second year, they are elective. The electives must be chosen under the advice and direction of the Dean of the School of Agriculture. Students who have approved farm experience will, upon completion of this course, be awarded certificates.

THE SCHOOL OF ARTS AND SCIENCES

In the School of Arts and Sciences there are offered the following four courses:

REGULAR FOUR-YEAR COURSES

Course in Liberal Arts.
Course in Science.

COURSE IN LIBERAL ARTS

This course is planned to meet the needs of students who have not made a definite decision regarding their life work, and who desire adequate preparation for intelligent citizenship, or a broad foundation for further education. The program of studies, especially in the upper years, is shaped to meet the needs and aptitudes of the individual student.

The first two years of the course in Liberal Arts provide the necessary fundamental preparation for students who are planning to study law.

This course also offers excellent facilities for the training of teachers of English, history, economics, languages, mathematics, and physical education.

The course in Liberal Arts leads to the degree of Bachelor of Arts.

COURSE IN SCIENCE

The work of the course in Science is planned with the following purposes in view:

1. To prepare students for research in the various fields of scientific activity, by means of thorough instruction in the sciences of biology, chemistry, entomology, geology, mathematics, and physics, especially as they relate to agriculture, engineering, and allied industries.

2. To provide the necessary fundamental preparation for students planning to enter upon the study of medicine.

3. To train teachers of science in secondary schools and other institutions of learning.

Students in the course in Science who complete at least two years of work preparatory to Medicine, and who subsequently complete the first two years in Medicine in a class A medical college, will be awarded the degree of Bachelor of Science, in Science, upon transfering their medical credits back to this institution. The work completed in this institution must include all of the prescribed subjects listed for the freshman and sophomore years of the Course in Science, and at least ten hours of approved electives.

THE SCHOOL OF ENGINEERING

In the School of Engineering there are offered the following courses:

REGULAR FOUR-YEAR COURSES

Course in Architecture.
Course in Chemical Engineering.
Course in Civil Engineering.
Course in Electrical Engineering.
Course in Mechanical Engineering.
Course in Textile Engineering.

TWO-YEAR COURSES

Two-year course in Textile Engineering.
Two-year course in Cotton Marketing and Classing.

COURSE IN ARCHITECTURE

The course in Architecture is planned to give thorough instruction in those subjects which are generally recognized as necessary in the preparation of students for work in Architectural Design and Building Construction. It is arranged to make the practice classes reflect the instruction given in the theoretical subjects and to associate the two in practical applications and problems, which are intended to prepare the student for immediate usefulness and earning ability after graduation. While particular emphasis is given throughout the course to the unison of design and construction which exists in all practical architectural work, the course is arranged in two groups; Group 1, which develops special ability in composition, planning, and rendering in the later years of the course; Group 2, which devotes particular attention to the structural elements of architectural practice during the later years. The same work is done by the Freshman class in these two groups, and as the courses develop, the emphasis upon the special work of each group is increased, and in the Senior year, becomes distinct and separate. Both groups give a sufficiently broad training in Architecture to make the student effective in general architectural work after graduation.

In the selection of either of these groups the student should be guided by his natural inclination toward the type of work which is emphasized in these groups. Graduates in Architecture find positions as draughtsmen, designers, superintendents or general assistants in architects offices; in the architectural and engineering department of business and railway corporations; in construction companies; in State and Municipal employment and in the Federal Civil Service. A few years of practical experience should fit the graduate to enter upon independent architectural practice.

COURSE IN CHEMICAL ENGINEERING

This course is designed to prepare young men for technical work in those industries in which raw materials undergo a chemical change in the process of manufacture. Many fields are open to students trained in applied chemistry,

and inquiries are continually being received asking for men capable of filling important positions in different industries. Some industries important to the present and future development of this State are those dealing with cottonseed products, sugar, leather, petroleum, cement, ceramics, and iron and steel. The analytical chemistry given in the course is sufficient to enable the graduate to engage in the work of a commercial plant or to enter an industrial plant as a control chemist. The control chemist repeatedly analyzes and evaluates the raw material used in the manufacture as well as the intermediate and finished products. It is through such control that industries of this kind have been made scientific. Pure food laws and other legal enactments calculated to protect the people against fraud have, of late years, greatly accentuated the importance of this work. At the same time enough work is given in general engineering practice to enable the graduate who enters the works as a control chemist to come in time to a full understanding and mastery of the industry in which he is engaged.

COURSE IN CIVIL ENGINEERING

The course in Civil Engineering has for its object the thorough grounding of young men in the underlying principles of engineering, with such training in the art of putting these principles into practical use as will enable graduates in this course to give satisfactory service in an engineering organization immediately upon graduation.

During the first three years the student is given training in the subjects common to all civil engineering courses, such as surveying, railroad engineering, mechanics, strength of materials, masonery structures, and stress analysis. In the fourth year he elects one of the three groups, general civil engineering, highway engineering or municipal and sanitary engineering. Part of the work for these three groups is the same for all. In the highway group more emphasis is placed on pavements and highway materials than in the others, while in the general civil engineering group somewhat more attention is given to stresses and design of bridges and other structures. In the municipal and sanitary engineering group less time is devoted to structures than for the other two, with correspondingly greater emphasis on water supply, sewage disposal, sanitation, and other municipal problems. Either group will fit the student for entering any of the many lines of work open to civil engineers, among which may be mentioned the following: professional practice in surveying; water supply, sewerage and sewage disposal; railway location, construction and maintenance, the design and construction dams, reservoirs, canals, foundations, buildings, bridges, and other structures; design, construction and maintenance of roads and pavements; planning and execution of sanitary measures for rural and urban communities; administration of city business as city manager; research work in colleges or government bureaus; technical service of various kinds in the organizations, leading to executive positions in the organization.

COURSE IN ELECTRICAL ENGINEERING

The course in Electrical Engineering is designed to give the student a thorough training in the underlying principles of direct and alternating current phenomena and of electric measurements. It provides training in subjects fundamental to the general practice of the engineering profession, in the theory of electricity, and in the application of the theory to practical problems in many branches of engineering.

The work of the first three years of the course includes the mathematics, chemistry, physics, drawing and mechanics fundamental to any engineering course. The electrical engineering subjects begin in the sophomore year and continue in an increasing amount through the junior and senior years. Strong emphasis is put on the fundamental principles of electrical engineering, but the fundamentals are vitalized by illustration of their applications in engineering practice. In the senior year without reducing the time devoted to fundamental subjects an opportunity is given the student to make a study of the application of electrical engineering to some field of engineering. This is done with two purposes; the first, and more important is to impress more firmly on the student's mind the principles already covered; and the second is to give the student specific information about some branch of electrical engineering.

Electrical Engineering presents broad opportunities for the young man with the proper training. A few of the fields which he may enter are outlined below:

The electric power plant in a community has come to be considered the source of energy not only for the lighting of the buildings and streets, but for the operation of all kinds of machinery ranging in size from the largest factory to the sewing machine and the vacuum cleaner. It is recognized that technically trained engineers are needed not only for the more highly technical positions in the organization of the central stations but that by virtue of their technical knowledge they are also best qualified for practically every position of responsibility in such organizations.

The utilization of electrical energy by manufacturing organizations has necessitated the employment of electrical engineers to design the installation of the electrical machinery and supervise it when it is in operation.

The electric railway industry is another field in which electrical engineers are required, and the electrification of steam railroads has created a demand for electrical engineers to supervise the electrical equipment used in the production of the power and operation of the trains. The electrification of railroads is in its infancy but the decided gain in efficiency from operating with electricity instead of steam will cause a steady increase in the number of roads to be electrified.

The telephone and telegraph companies have always used a limited number of electrical engineers but with the greater complexity of electrical devices which are displacing the simpler systems, trained engineers are in demand not only for the more highly specialized positions but also for administrative and executive positions where a knowledge of electrical engineering is becoming important. Radio engineering is a new field for electrical engineers which, while comparatively new, bids fair to become of considerable importance.

Many electrical engineers are needed in organizations engaged in the manufacture of electrical machinery and in its sale and erection.

There are a great many subdivisions such as that of the illuminating engineer, the signal engineer, the battery engineer, and a score of others which offer excellent fields for the men with proper training.

The course is outlined with a view to giving a young man such fundamental principles of electrical engineering and such mental development and faculty of analysis, as will enable him to rise to a position of responsibility in any one of the principal fields of electrical engineering.

A Signal Corps Unit of the Reserve Officer's Training Corps has been established at the College and electrical engineering students who elect to become members of this nuit have an opportunity to receive thorough instruction in telephone, telegraph and radio engineering in addition to their other engineering work. For use in the Signal Corps work, the government has supplied a complete assortment of modern equipment.

A branch of the American Institute of Electrical Engineers has been organized among the students and affords the means of keeping students in touch with the latest development in the electrical field.

COURSE IN MECHANICAL ENGINEERING

The course in Mechanical Engineering is designed with a view of giving the student such training as will fit him to design, construct and erect machinery, power and industrial plants, equipment, etc., and to manage or to operate the same with the greatest economy of labor and materials.

It is not possible to give the student that skill in the shops and that experience in the laboratories which come with long service in practical work, but the aim is to give him the power to understand and apply the underlying principles which are involved in all problems met with in practical engineering.

When it is remembered that there is a steam power plant or other mechanical equipment connected with practically every industrial enterprise it is apparent that the graduates from the course in Mechanical Engineering should find a large field for their activities in the industrial development of the State. While the chief aim of the curriculum is to give a thorough grounding in the fundamentals it is possible for the student, by group selection in his senior year and by selection of his electives, to do a limited amount of specializing along the line of his choice. The group arrangement of the senior year enables the student to specialize in power plant work, in transportation and railway mechanical engineering, or in factory management and industrial engineering. The electives enable the student to specialize in cottonseed oil industry, or in petroleum industry. The training at the College, followed by a few years contract with the practical work, should fit one to take charge of the operation or of the management of almost any industrial enterprise whether strictly mechanical engineering or involving other activities as well.

Included in the field of the graduate from this course are the following: railway motive power, automotive and marine transportation, refrigeration, steam and oil engine power equipment, heating and ventilation, iron and steel production and fabrication, machine tool industry, lumber production and utilization, factory management, production and refining of petroleum, and other mineral resources, and also practically unlimited other lines.

In addition to the purely technical studies, the Mechanical Engineering course has a well balanced portion of cultural subjects which provide a good general education and equip the graduate for leadership in his community. The habits of accurate analysis and the training in logical thinking make him a better citizen and a more desirable leader.

COURSE IN TEXTILE ENGINEERING

The object of this course is to prepare young men for entering the field of cotton manufacturing. The unprecedented development of the cotton milling

industry in the South has brought about an era of prosperity and created a strong demand for educated young men in this industry. The State of Texas offers excellent advantages for the manufacture of cotton goods in its vast supply of raw material, intelligent labor, and excellent climatic conditions, and it is believed that cotton manufacturing will develop as rapidly as skilled and capable managers familar with local conditions are to be had. The studies outlined have been selected with a view of giving theoretical and practical training in the manufacture of cotton goods as thorough as is possible in the time available.

Graduates from this course are prepared to enter the cotton mills to operate any machinery. After a study of labor conditions and requirements they are in line for positions of overseers, superintendents and managers. Graduates may also find employment in the fields of mill engineering and architecture, installation of equipment, dyeing and the sale of machinery and supplies.

TWO-YEAR COURSE IN TEXTILE ENGINEERING

The two-year course in Textile Engineering is intended for young men who wish to take up the work of cotton manufacturing and cannot spend more than two years in preparation.

The aim is to prepare young men for responsible positions in a cotton mill after a short term of apprenticeship. A limited number of students taking either textile course will be given employment during their vacant periods in operating the equipment of the department which is turning out a commercial product. In this way students are encouraged to devote a good deal more time to the operation of the machinery, which should better fit them for their career in the mill and at the same time help to pay their expenses in college. Certificates will be given students who complete the work as outlined.

Students completing this course are fitted in a limited way for the same fields that are open to graduates.

The entrance requirements for this course are the same as for the four-year course.

TWO-YEAR COURSE IN COTTON MARKETING AND CLASSING

The two-year course in Marketing and Classing is intended for the student who expects to enter the cotton business either as buyer, or office man. The course of study is designed to familiarize the student with the position of cotton among agricultural resources, the economics of cotton, business law, money and banking, marketing, and waste in manufacture as related to cotton. Courses are offered giving the fundamental principles and much detail of cotton office accounting. The course proposes to give, in addition to the fundamental subjects, some gerenal educational courses which will better fit the student for the cotton business.

The entrance requirements for this course are the same as for the four-year courses.

. THE SCHOOL OF VETERINARY MEDICINE

COURSE IN VETERINARY MEDICINE

This course has for its object the systematic training of young men in all matters pertaining to diseases of domestic animals.

The freshman and sophomore years are, in large measure, devoted to those physical and biological studies that contribute so much to an understanding of problems of health and diseases. The junior and senior years are almost entreily devoted to studies of a technical nature.

Those who expect to engage in ranching, dairying or some other branch of animal industry, will find the course of great value to them in preventing serious losses from diseases or mismanagement of their animals. Those who possess a biological mind will find it an interesting life study, and such men are in great demand in matters of public health or as investigators in Experiment Stations. Those who pursue the course from commercial motives will find its rewards are similar to those of any other form of human endeavor in that these will always be in proportion to the intelligence and energy displayed by the individual.

When it is recalled that the value of domestic animals in Texas is about five hundred million dollars, it becomes apparent that men informed on such matters will be of great value to the State.

COURSE IN AGRICULTURE AND VETERINARY MEDICINE

This course offers an opportunity for students to get training both in Animal Husbandry and in Veterinary Medicine. It is so arranged that the courses of study in both curricula can be completed in six years. In many instances it is desirable that students entering into the animal industries have a more thorough understanding of Veterinary Medicine than can be given in the four-year course in Animal Husbandry. It is also true that many positions which are open to graduates in Veterinary Medicine carry with them the responsibilities that require more training in Animal Husbandry than can be offered in the four-year course.

It is thought best that this coourse will come more nearly fulfilling the requirements of youn gmen going into many live stock pursuits than the College has yet had the opportunity to offer.

THE SCHOOL OF VOCATIONAL TEACHING

In the School of Vocational Teaching there are offered the following courses:

REGULAR FOUR-YEAR COURSES

Course in Agricultural Education.
Course in Industrial Education.
Course in Rural Education.

COURSE IN AGRICULTURAL EDUCATION

The purpose of the course in Agricultural Education is to prepare teachers of agriculture in the secondary schools and supervisors and directors of vocational agriculture as carried on under the Smith-Hughes Act. A study of the fundamental principles in the main divisions of agriculture, and a minimum of professional training and practice teaching are required. Considerable opportunity is given the student by means of the electives for choice of subjects. In case of students transferring from other institutions and entering the course in Agricultural Education, the electives are not limited to the courses offered by the School of Agriculture; such credit and classification will be given as the facts may warrant. Agricultural students who have completed the junior year in the State Teachers Colleges and graduates of the Junior Agricultural Colleges can transfer to this course with little or no loss of time.

Graduates of approved institutions having satisfactory training in the sciences underlying the study of agriculture will be awarded the degree of Bachelor of Science in Agricultural Education upon satisfying the following requirement: forty-five term-hours of technical agriculture as approved by the Dean of the School of Vocational Teaching, fifteen term-hours of professional subjects as prescribed in the curriculum, and at least a year's residence. Canidates for admission under this provision must present their credits in advance.

The great demand for skilled teachers and administrators of vocational agriculture in every state should make this course appeal to young men with good science training, farm experience, and successful experience in teaching and administering schools.

COURSE IN INDUSTRIAL EDUCATION

This course is for the benefit of teachers, supervisors, and directors of the general continuation, trade and industrial schools and classes of Texas and for those who desire to teach and can qualify under the requirements set up by the State Board of Vocational Education.

The State plans for the requirements of teachers of shop and related subjects in classes using Federal funds under the provisions of the Smith-Hughes Act specify that the teacher must have had a definite amount of industrial experience. Students in this course are advised to get as much other experience as possible before entering and during the course as it will assist them in securing a desirable position under graduation.

Students preparing to teach related subjects may take part or all of their

shop work in the engineering department, but those wishing to teach shop courses must get their experience in industry as required in the State plan. College credit will be allowed for this work on the basis of four term hours for each year of certified experience, up to a maximum of twenty term hours.

The constant demand for instructors with industrial education experience should make this course appeal to men interested in education work.

A total of 160 term hours must be completed for graduation.

The extension courses described elsewhere in the catalogue offers opportunity for all trade, industrial and continuation school teachers to obtain a degree by taking the itinerant teacher training work in the winter and the resident work in the summer.

COURSE IN RURAL EDUCATION

This course was organized in response to a growing demand for principals of rural schools who have had the benefit of an agricultural college education in their preparation for leadership in the solution of rural life problems. The curriculum in rural education permits the student to qualify for the various elementary and high school certificates granted on college credits by the State Department of Education.

TEACHER'S CERTIFICATES

1. An elementary certificate good for four years, or a high-school certificate good for two years, may be obtained upon completion of the work prescribed for Freshmen in Course XVI, or its equivalent.

2. An elementary certificate good for six years may be obtained on completion of two years work in rural education, or its equivalent.

3. By substituting Rural Education 321 and 322 for Rural Education 221 and 222, the student may qualify for a four-year high-school certificate at the end of his second year in college.

4. A high-school certificate good for six years may be obtained on completion of three years work in rural education or its equivalent.

5. The permanent high-school certificate may be obtained upon completion of the four-year course in rural education, or its equivalent.

THE GRADUATE SCHOOL.

General Statement—The Graduate School was established in 1924. Prior to that time graduate work was administered by the General Faculty, acting through a Committee on Graduate Studies. The Faculty of the Graduate School consists of such members of the teaching staff and of the staff of the Agricultural Experiment Station as the General Faculty may determine, and has general jurisdiction over all matters relating to graduate work.

Administration.—Matters of general policy are considered by the Graduate Council, which reports its recommendations to the Faculty of the School. In cases in which prompt action is desirable the Council is authorized to act, reporting its action to the Faculty for ratification.

The Executive Committee, consisting of five members of the Council, is authorized in routine matters to take final action in accordance with the general policies.

The Dean of the Graduate School is the representative of the Faculty in dealing with individuals, and is charged with the execution of its regulations. Petitions are acted upon by the Dean or by the Executive Committee, as the case may require.

All communications relating to graduate work should be addressed to the Dean of the Graduate School.

Character of Graduate Work.—The principal aim of graduate study is the development of the power of independent work and the promotion of the spirit of research. Each candidate for a degree is expected to have a wide knowledge of his subject and of related fields of work; the graduate student is not expected to get from lecture and laboratory courses all the knowledge and training necessary to meet the requirements for his degree.

Degrees.—The completion of an approved course of study in the Graduate School leads to the degree of Master of Science. Professional degrees in engineering—Chemical Engineer, Civil Engineer, Electrical Engineer, Mechanical Engineer,—are offered on the basis of acceptable profesional experience, a thesis, and an examination.

REQUIREMENTS FOR THE MASTER'S DEGREE

General—The master's degree denotes that attainment which a student of good native ability, who has received an appropriate bachelor's degree, may reasonably expect to attain in one year of entire and successful devotion to advanced studies, with adequate facilities and under competent direction. The courses of study leading to this degree do not make research the chief consideration, but are intended to serve as an introduction to the methods and discipline of research.

Specification as to course.—The course of study pursued is specified in the diploma. In his application for admission the student must designate his course of study as one of the following:

Agricultural Administration.
Agricultural Education.
Agricultural Engineering.
Agriculture.
Architecture.
Chemical Engineering.
Civil Engineering.
Electrical Engineering.
Industrial Education.
Mechanical Engineering.
Rural Education.
Science.
Veterinary Medicine.

Admission.—In order to be admitted to a course of study leading to the master's degree, the candidate must satisfy the following requirements:

1. He must be a graduate of this College or of some other approved institution whose requirements for graduation are substantially equivalent to those of this College.

2. His undergraduate course of study must be of such nature as to afford a satisfactory foundation for the graduate studies he proposes to take up.

3. His undergraduate record must be of such high order as to satisfy the committee that he is qualified by native ability and by training to pursue graduate studies with profit and with credit. In case it does not fully meet this requirement, the committee may require the completion of additional undergraduate work with a grade of at least B.

Application.—Application should be made at least one month in advance, and in case the candidate comes from another institution, his application must be accompanied by a complete transcript of his undergraduate record, properly certified.

Admission to Candidacy.—Admission as a graduate students does not imply admission as a candidate for a degree. In order to become a candidate for an advanced degree, the student must make formal application,— in the regular session before December 15, and in the summer session one week before the close of his first term. The application will be approved only in case the student has demonstrated his ability to do graduate work in creditable manner.

Registration.—Graduate students must register at the beginning of each term at the office of the Registrar and of the Dean.

Their assignment cards are to be approved by the Dean.

Amount of Work.—The candidate for the degree of Master of Science must do at least one full year's work. By this is meant that he must register for, attend, and complete courses amounting to at least sixteen term hours each term, and in addition must submit a satisfactory thesis. Four term hours each term are assigned to the thesis. The total requirements for the year, therefore, amount to forty term hours.

Course of Study.—The subjects constituting the student's complete course of study are to be chosen subject to the approval of the Executive Committee.

In general, the work must be made up of graduate courses, and in every case must include at least twelve term hours each term in such courses in addition to the thesis. In cases in which it may be deemed advisable the remainder may consist of advanced undergraduate courses. Each hour of theory involves two hours of preparation.

Major and Minor Subjects.—For the degree of Master of Science in Agricultural Administration, in Agricultural Education, in Agricultural Engineering, in Agriculture, in Industrial Education, in Rural Education, in Science, in Veterinary Science, the candidate must choose a major subject and one or two minor subjects. A major or a minor denotes the field of knowledge of a department. With the approval of the Executive Committee, the major may be taken in two closely allied departments. In his major subject the student must take courses amounting to at least eight term hours each term, in addition to his thesis. Courses in minor subjects must be chosen by the student after consultation with the head of his major department.

Residence.—The master's degree will not be conferred except after a residence of at least one year at the College. For candidates engaged in teaching or other regular employment, the period of residence will be increased to such extent as the committee may determine. Members of the Staff may not take in any term of the regular session more than one-fourth of a full term's work.

Work in the Summer Session.—The residence requirement may be satisfied by residence during four summer terms of six weeks each. Courses offered in the summer session cover essentially the same ground as that covered by the corresponding courses of the regular session. The maximum amount of work for which a student may register in a summer term is eight term hours. In the summer session each hour of theory involves three hours of preparation.

The candidate who spends only four summer terms in residence may fulfill the requirements for the master's degree, provided that, in the ad interim periods between summer sessions, he does the greater part of the work on his thesis. Authority to do thesis work in this way must be obtained through the Dean, and the student must make such reports of progress as the head of his major department may require.

Work in Absentia.—No provision is made for work *in absentia* except that student who is in residence during summer sessions only must do thesis work between summer sessions as stated above.

Courses Offered by Experiment Station Staff.—In addition to the courses offered by the several departments of instruction there are graduate courses offered by members of the Agricultural Experiment Station Staff and described under the respective departments.

Quality of Work.—In order to be allowed to go on with his course a graduate student must give continued satisfaction in his work.

Initiative.—In carrying on his work in the Graduate School, the student is expected to keep himself informed as to the regulations and to assume the initiative in complying with them.

Thesis.—The candidate must submit a thesis, which shall be based upon his

work in the department in which he takes his leading subject. Its title must be submitted to the committee through the head of the department in which it is to be written for approval by November 15. In matter and style the thesis must be acceptable to the head of the department in which it is written and to the committee. It must show that the candidate has the ability to do independent work; and, by correct citation of authorities, must show that he has satisfactory acquaintance with the literature of his field.

The thesis must be typewritten on paper 8½ inches by 11 inches; two weeks before commencement it must be presented to the Dean through the head of the department in completed form ready for binding. Before the degree is conferred a bound copy for the College library must be deposited with the Dean.

Examinations.—At the close of the term written examinations are held in each graduate course and it is the duty of the head of the department concerned to file with the Dean a copy of the questions. In addition to the term examinations, a student must pass a final examination covering his entire course of study and his thesis. The final examination may be oral or written or both and is open to the committee and to members of the Faculty.

Reports.—Heads of departments will make reports to the Registrar at the end of each term on all graduate work done in their respective departments and such other reports on the progress of their graduate students as the Dean may request.

Special Committee.—The instructors under whom a graduate student takes work shall constitute a special committee to direct and advise him concerning his work and to represent him before the Executive Committee. The instructor in charge of the leading subject shall be chairman of the special committee in each case.

Fees.—A statement of the fees to be paid by graduate students is given under "expenses" in Part III.

Leave of Absence or Withdrawal.—Requests for authority to be absent from the College or to withdraw permanently must be presented to the Dean through the Commandant.

Graduation.—Candidates for advanced degrees who expect to complete their work at the end of a given term must give written notice to the Dean to that effect at least one month in advance. When a candidate has to the satisfaction of the Executive Committee completed the requirements for an advanced degree he will be recommended to the Faculty for his degree. The diploma fee is $7.50.

PROFESSIONAL DEGREES IN ENGINEERING

The professional degrees in engineering, Chemical Engineer, Civil Engineer, Electrical Engineer, Mechanical Engineer, are open only to men who have received from this College the degree of Bachelor of Science or Master of Science in an engineering course.

The requirements for any one of these degrees include acceptable professional experience, a thesis, and an examination. In detail the requirements are as follows:

The candidate must have been engaged in acceptable professional work for a period of not less than four years after graduation, and must have been in re-

sponsible charge of such work for at least one year. The applicant who holds the degree of Master of Science in an engineering course is regarded as having met the time requirement if he has devoted three years to professional practice or to teaching engineering subjects.

In connection with this his application for authority to register, the candidate must submit an orderly and detailed statement of the professional experience for the consideration of the Executive Committee. He must also submit a title for his thesis and a general outline of the thesis.

At a time to be designated by the Dean he must report at the College for an examination covering his professional experience, his thesis and the research or study which forms its basis.

The thesis must correspond in form to the master's thesis described above. It must not be simply a descriptive discussion of some ordinary engineering project, nor a digest of engineering literature, but must be of an analytical character and must constitute a distinct contribution to engineering science. The thesis in final form must be in the hands of the Dean three weeks before commencement.

The degree is conferred only at commencement, and application for registration must be made not later than November 1 preceding. In case a student does not complete the work for his degree within two years after registration, his registration will be cancelled.

The fees are a registration fee of $5.00 to be paid at registration, and a diploma fee of $7.50 to be paid before commencement.

No residence study is required.

SCHOLARSHIPS AND FELLOWSHIPS

The College offers annually a limited number of graduate scholarships, each carrying a stipend of $200.00, and of fellowships, each carrying a stipend of $600.00. In either case payments are made in eight equal installments.

An applicant for a scholarship or fellowship must meet the requirements for admission to the Graduate School and must express his intention of completing in this College the requirements for the master's degree. He must also agree, in consideration of the award, to render a reasonable amount of service, to be determined by the Dean of the Graduate School and the head of the department in which he takes his major work.

Applications must be made on forms to be obtained from the Dean of the Graduate School and must be accompanied by a letter of recommendation from the President or other officer of the institution from which the applicant comes.

Nominations to scholarships or fellowships are made on the basis of worthiness of character, scholastic attainments, and promise of success in the principal field of study to which the applicant proposes to devote himself. They are made by the Dean of the Graduate School, subject to the approval of the President.

TEXAS POWER AND LIGHT COMPANY FELLOWSHIP IN ENGINEERING.

The Texas Power & Light Company offers a graduate fellowship in engineering having a value of six hundred dollars and open to graduates from the

Electrical Engineering or Mechanical Engineering courses. The selection is made each year by a committee on the basis of the applicant's fitness for some branch of the public utility field and his ability to profit by his studies, due consideration being given to his undergraduate scholastic record.

WEST TEXAS UTILITIES COMPANY SCHOLARSHIP.

The West Texas Utilities Company has established an annual scholarship with a value of two hundred and fifty dollars ($250) for the senior or graduate student in Electrical Engineering doing the most satisfactory work in public utility problems. The award is based on proficiency in certain courses in the College and also on initiative and grasp of the public utility problems as demonstrated by a paper on some aspect of public utility operation.

CURRICULA

THEORY, PRACTICE, TERM-HOUR.

In the curricula shown on the following pages, the time devoted each week to the several subjects is expressed in clock-hours. The hours devoted to "theory" (which includes recitations and lectures) are indicated in the column headed "Th.," the hours devoted to "practice" (which includes work in laboratory, shop, drawing room or field) are indicated in the column headed "Pr."

A "term-hour" is one clock-hour of "theory" or two clock-hours of "practice" per week for one term.

Notes.—1. In addition to the work shown in the several curricula,

(a) All first-year students are required to take physical training two hours a week.

(b) Students taking English are required to attend conferences with their instructors.

(c) In the four-year agricultural and engineering courses all students are required to attend an assembly not oftener than once a month.

(d) Members of the R. O. T. C. are required to devote two afternoons in the second term of every year to target practice.

2. Junior and senior courses in Military Science are required of members of the advanced course in the R. O. T. C.; they are not open to other students.

THE SCHOOL OF AGRICULTURE

I.—COURSE IN AGRICULTURE

FRESHMAN YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Agronomy 105 Fundamentals of Crop Production	3	2	Animal Husbandry 102 Market Types	0	4
Animal Husbandry 101 Market Types	0	4	Biology 102 General Botany	2	4
Biology 101 General Botany	2	4	Chemistry 102 Inorganic	3	3
Chemistry 101 Inorganic	3	3	English 104 Rhetoric and Composition	3	0
Dairy Husbandry 101 Judging Dairy Cattle	0	2	Mathematics 108 Agricultural	3	0
English 103 Rhetoric and Compostion	3	0	Military Science 102 or 104	1	2
Military Science 101 or 103	1	2	Textile Engineering 102 Cotton Classing	0	2
	12	17		12	15

SOPHOMORE YEAR

**Biology 207 Zoology	2	4	Agricultural Eng. 201 Farm Machinery	2	2
English 203 Adv. Composition	2	0	**Biology 206 Bacteriology	1	4
Entomology 201 General	2	2	Chemistry 206 Organic	3	2
Geology 201 General	3	2	Dairy Husbandry 202 Dairying	2	2
Horticulture 201 Plant Prop. and Orcharding	2	2	English 204 Adv. Composition	2	0
Military Science 201 or 203	1	2	Military Science 202 or 204	1	2
*Elective	3		*Elective	3	
	15	12		14	12

*To be chosen from the following:

Agricultural Economics 101 Agricultural Resources	3	0	Agricultural Education 207 ~~208~~ Educational Psychology	3	0
Agricultural Engineering 203 Gas Engines	2	2	Animal Husbandry 202 Breed Types	2	2
Poultry Husbandry 102 Farm Poultry	2	2	Geology 210 Agricultural	2	2
Rural Sociology 201 Human Relationships	3	0	Horticulture 202 Vegetable Gardening	2	2
Agricultural Economics 102 Agricultural Resources	3	0	Rural Sociology 202 Social Evolution	3	0

**One half of the class will take Biology 207 the first term and Biology 206 the second term. The other half will take those subjects in the reverse order.

GROUP 2. AGRICULTURAL EDUCATION

JUNIOR YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Agricultural Education 305 Principles of Education	3	0	Agricultural Education 308 Educational Psychology	3	0
Agronomy 301 Soils	3	2	Economics 403 Fundamental Principles	3	0
Chemistry 309 Agricultural Chemistry	3	3	English ~~303~~ 304 Argumentation	2	0
English 301 Argumentation	1	0	*Elective	12	
*Elective	8			20	0
	18	5			

SENIOR YEAR

Agricultural Economics 411 Agricultural Economics	2	2	Agricultural Economics 421 Farm Management	2	4
Agricultural Education 401 Principles of Teaching	3	2	Agricultural Education 402 Admin. of Voc. Agriculture	3	2
English 401 Public Speaking	1	0	English 402 Public Speaking	1	0
*Elective	12		*Elective	12	
	18	4		18	6

GROUP 3. AGRICULTURAL ENGINEERING

JUNIOR YEAR

Agricultural Engineering 305 Surveying and Drainage	3	4	Agricultural Eng. 214 Tractors	2	4
Agronomy 301 Soils	3	2	Economics 403 Fundamental Principles	3	0
Chemistry 309 Agricultural Chemistry	3	3	English ~~303~~ 304 Argumentation	2	0
English 301 Argumentation	1	0	*Elective	11	
*Elective	6			18	4
	16	9			

SENIOR YEAR

Agricultural Economics 411 Agricultural Economics	2	2	Agricultural Economics 421 Farm Management	2	4
Agricultural Engineering 413 Farm Buildings	2	3	Agricultural Eng. 402 Automobiles and Trucks	2	4
English 401 Public Speaking	1	0	English 402 Public Speaking	1	0
*Elective	13		*Elective	11	
	18	5		16	8

GROUP 4. AGRONOMY

JUNIOR YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Agronomy 301 Soils	3	2	Agronomy ~~308~~ 307 Forage Crops	2	2
Chemistry 309 Agricultural Chemistry	3	3	Agronomy 314 Field Crops	3	2
English 301 Argumentation	1	0	Economics 403 Fundamental Principles	3	0
Genetics 301 Genetics	3	2	English ~~303~~ 304 Argumentation	2	0
*Elective	8		Genetics 304 Plant Breeding	3	2
			*Elective	5	
	18	7		18	6

SENIOR YEAR

Agricultural Economics 411 Agricultural Economics	2	2	Agricultural Economics 421 Farm Management	2	4
Agronomy 411 Soil Fertility	2	2	Agronomy 416 Soils and Crops Seminar	1	0
Agronomy 415 Soils and Crops Seminar	1	0	English 402 Public Speaking	1	0
Animal Husbandry 409 Animal Nutrition and Feeding	3	2	*Elective	14	
English 401 Public Speaking	1	0		18	4
*Elective	8				
	17 ~~18~~	6			

GROUP 5. ANIMAL HUSBANDRY

JUNIOR YEAR

Agronomy 301 Soils	3	2	Economics 403 Fundamental Principles	3	0
Animal Husbandry 303 Animal Nutrition	3	2	English ~~303~~ 304 Argumentation	2	0
Chemistry 309 Agricultural Chemistry	3	3	Genetics 306 Animal Breeding	2	2
English 301 Argumentation	1	0	Veterinary Anatomy 302 Anatomy and Physiology	2	2
Genetics 301 Genetics	3	2	*Elective	9	
*Elective	4			18	4
	17	9			

SENIOR YEAR

Agricultural Economics 411 Agricultural Economics	2	2	Agricultural Economics 421 Farm Management	2	4
English 401 Public Speaking	1	0	English 402 Public Speaking	1	0
Veterinary Medicine 403 Animal Diseases	3	2	*Elective	15	
*Elective	12			18	4
	18	4			

Note.—In group 5, the senior electives must include at least one course in Animal Husbandry each term.

GROUP 7. DAIRY HUSBANDRY

JUNIOR YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Agronomy 301 Soils	3	2	Dairy Husbandry 306 Butter Making and Factory Management	3	2
Chemistry 309 Agricultural Chemistry	3	3	Economics 403 Fundamental Principles	3	0
Dairy Husbandry 301 Market Milk	2	2	English ~~303~~ 304 Argumentation	2	0
English 301 Argumentation	1	0	*Elective	12	
Genetics 301 Genetics	3	2		20	2
*Elective	5				
	17	9			

SENIOR YEAR

Agricultural Economics 411 Agricultural Economics	2	2	Agricultural Economics 421 Farm Management	2	4
Animal Husbandry 303 Animal Nutrition	3	2	Dairy Husbandry 406 Feeding and Management	3	2
English 401 Public Speaking	1	0	English 402 Public Speaking	1	0
*Elective	12		*Elective	11	
	18	4		17	6

GROUP 9. HORTICULTURE

JUNIOR YEAR

Agronomy 301 Soils	3	2	Economics 403 Fundamental Principles	3	0
Chemistry 309 Agricultural Chemistry	3	3	English ~~303~~ 304 Argumentation	2	0
English 301 Argumentation	1	0	Genetics 304 Plant Breeding	3	2
Genetics 301 Genetics	3	2	Horticulture 310 Commercial Veg. Production	2	2
Horticulture 303 Principles of Fruit Production	3	2	*Elective	9	
*Elective	4			19	4
	17	9			

SENIOR YEAR

Agricultural Economics 411 Agricultural Economics	2	2	Biology 416 Plant Diseases	2	4
English 401 Public Speaking	1	0	English 402 Public Speaking	1	0
Horticulture 401 Pomology	3	2	*Elective	~~15~~ 13	
Horticulture 421 Commercial Horticulture	2	2		~~18~~	~~8~~
Horticulture ~~423~~ 419 ~~Commercial Fruit Production~~	~~2~~ 1	~~4~~ 3		16	8
*Elective	~~8~~ 8				
	~~15~~ 17	~~10~~ 6			

GROUP 10. LANDSCAPE ART

JUNIOR YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Agricultural Engineering 306 Surveying and Drainage	3	4	Economics 403 Fundamental Principles	3	0
Agronomy 301 Soils	3	2	English ~~303~~ 304 Argumentation	2	0
English 301 Argumentation	1	0	Horticulture 308 History of Landscape Art	2	0
Horticulture 307 Introduction to Landscape Art	2	4	*Elective	13	
*Elective	8			20	0
	17	10			

SENIOR YEAR

Agricultural Ecnomics 411 Agricultural Economics	2	2	English 402 Public Speaking	1	0
Architecture ~~402~~ 407 History of Art	2	0	Horticulture 416 Landscape Design	3	8
English 401 Public Speaking	1	0	*Elective	~~14~~ 12	
Horticulture 415 Landscape Design	3	~~8~~		~~18~~ 16	~~8~~ 8
*Elective	7				
	~~17~~				

GROUP 11. POULTRY HUSBANDRY

JUNIOR YEAR

Agronomy 301 Soils	3	2	Economics 403 Fundamental Principles	3	0
Chemistry 309 Agricultural Chemistry	3	3	English ~~303~~ 304 Argumentation	2	0
English 301 Argumentation	1	0	Genetics 308 Poultry Breeding	2	0
Genetics 301 Genetics	3	2	Poultry Husbandry 302 Feeding and Brooding	3	2
Poultry Husbandry 301 Preparing for Market	2	2	*Elective	9	
*Elective	4			19	2
	16	9			

SENIOR YEAR

Agricultural Economics 411 Agricultural Economics	2	2	English 402 Public Speaking	1	0
English 401 Public Speaking	1	0	Poultry Husbandry 402 Poultry Farming	2	2
Poultry Husbandry 401 Management	2	2	*Elective	16	
Poultry Husbandry 403 Judging	2	2		19	2
*Elective	10				
	17	6			

GROUP 12. RURAL SOCIOLOGY

JUNIOR YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Agricultural Economics 305 Statistics	2	4	Agricultural Economics ~~421~~ 312 ~~Farm Management~~ Ag. Econ	2	~~4~~ 2
Chemistry 309 Agricultural Chemistry	3	3	English ~~303~~ 304 Argumentation	2	0
Economics 403 Fundamental Principles	3	0	History 305 Citizenship	3	0
English 301 Argumentation	1	0	(Rural Sociology 312 General Sociology	3	0) omit
Rural Sociology 311 Social Psychology	3	0	*Elective ~~812~~		
*Elective	4				
	16	7		19	2

SENIOR YEAR

English 403 Public Speaking	3	0	Agricultural Economics ~~413~~ 421 Farm Management	2	4
History 411 The Outline of History	3	0	English ~~402~~ 404 Public Speaking	~~3~~	0
Rural Sociology 407 Rural Sociology	2	2	History 412 The Outline of History	3	0
*Elective	11		(Rural Sociology 410 Leadership Training and Community Planning	1	4) omit
	19	2	*Elective ~~10~~ 11		
				~~17~~ 19	8 4

*JUNIOR AND SENIOR ELECTIVES

Junior electives must bear course numbers above 200 and senior electives must bear course numbers above 300.

Group 4a - Cotton Production and Marketing

Junior Year			
Biol. 315 (Pat. of Crop Pl.)	2-2	Agr. 316	2-2
Agr. 301	3-2	Agr. 410	2-2
Chem. 309	3-3	Econ. 403	3-0
Engl. 301	1-0	Engl. 304	2-0
Gen. 301	3-2	Gen. 304	3-2
Elective	5-0	Elective	6-0
Senior Year			
Ag.Ec. 411	2-2	Ag.Ec. 422	2-4
Ag.Eng. 419 (Cotton Mach.)	2-2	Ag.Ec. 512 (Cotton Prod.)	3-0
Engl. 431	1-0	Agr. 420 (Gen. Research Methods)	1-0
Ento. 411	2-2	Gen. 402	2-2
T. E. 413	1-2	Engl. 402	1-0
Elective	8-0	T. E. 414	0-2
		Elective	7-0

XIV.--COURSE IN AGRICULTURAL ADMINISTRATION

FRESHMAN YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Agricultural Economics 101	3	0	Agricultural Economics 102	3	0
Agricultural Resources			Agricultural Resources		
Biology 101	2	4	Biology 102	2	4
General Botany			General Botany		
Chemistry 101	3	3	Chemistry 102	3	3
Inorganic			Inorganic		
English 103	3	0	English 104	3	0
Rhetoric and Composition			Rhetoric and Composition		
Mathematics 101	3	0	Mathematics 102	3	0
Algebra			Algebra		
Military Science 101 or 103	1	2	Military Science 102 or 104	1	2
	15	9		15	9

SOPHOMORE YEAR

Agricultural Economics 201	2	4	Agricultural Economics 202	2	4
Accounting			Accounting		
Economics 203	3	0	Agronomy 105	3	2
Principles			Crop Production		
English 203	2	0	Drawing 222	0	3
Adv. Composition			Mechanical Drawing		
Military Science 201 or 203	1	2	Economics 204	3	0
*Elective	9		Principles		
			English 204	2	0
	17	6	Adv. Composition		
			Military Science 202 or 204	1	2
			*Elective	4	
				15	11

JUNIOR YEAR

Agricultural Economics 305	2	4	Agricultural Economics 312	2	2
Statistics			Agricultural Economics		
Economics 311	3	0	Economics 316	3	0
Money and Banking			Business Law		
English 301	1	0	English 303	2	0
Argumentation			Argumentation		
*Elective	12		*Elective	12	
	18	4		19	2

SENIOR YEAR

Agricultural Economics 401	3	0	Agricultural Economics 402	3	0
Marketing			Property and Contract		
Agricultural Economics 421	2	4	English 402	1	0
Farm Management			Public Speaking		
English 401	1	0	*Elective	16	
Public Speaking				20	0
Rural Sociology 407	2	2			
Rural Sociology					
*Elective	10				
	18	6			

*ELECTIVES

The electives must be chosen subject to the restrictions stated below:

1. A minimum of fifteen (15) term-hours from the following:

Agricultural Economics 303, 313, 419; 322, 404, 410, 412, 414, 416, 418, 424; Economics 309, 315, 413, 417; 304, 306, 410, 408; Mathematics 103, 203, 207, 301; 104, 103, 204, 208, 302.

2. A minimum of twelve (12) term-hours in technical agriculture to be taken in the departments of Agricultural Engineering, Agronomy, Animal Husbandry, Dairy Husbandry, Genetics, Horticulture, Poultry Husbandry.

XV.—COURSE IN AGRICULTURAL ENGINEERING

FRESHMAN YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Agricultural Eng. 101 Farm Shop	0	3	Agricultural Eng. 102 Farm Shop	0	3
Animal Husbandry 101 Judging Market Types of Beef Cattle and Sheep	0	4	Agronomy 105 Fundamentals of Crop Production	3	2
Chemistry 101 Inorganic	3	3	Chemistry 102 Inorganic	3	3
Drawing 101 Mechanical	0	2	Drawing 108 Mechanical	0	2
English 103 Rhetoric and Composition	3	0	English 104 Rhetoric and Composition	3	0
Mathematics 101 Algebra	3	0	Mathematics 102 Algebra	3	0
Mathematics 103 Trigonometry	3	0	Mathematics 104 Analytics	3	0
Mil. Sci. 101, 103, 105	1	2	Mil. Sci. 102, 104, 106	1	2
	13	14		16	12

SOPHOMORE YEAR

Agricultural Eng. 203 Gas Engines	2	2	Agricultural Eng. 214 Tractors	2	4
English 203 Adv. Composition	2	0	Civil Engineering 204 Analytic Mechanics	3	0
Horticulture 201 Plant Propagation and Orcharding	2	2	English 204 Adv. Composition	2	0
Mathematics 203 Calculus	5	0	Mathematics 204 Calculus	5	0
Mil. Sci. 201, 203, 207, 209	1	2	Mil. Sci. 202, 204, 208, 210	1	2
Physics 203 General	3	3	Physics 204 General	3	3
	15	9		16	9

JUNIOR YEAR

Agronomy 301 Soils	3	2	Agricultural Eng. 201 Farm Machinery	2	2
Geology 201 General	3	2	Agronomy ~~308~~ 305 Forage Crops	2	2
Civil Engineering 201 Plane Surveying	3	4	Dairy Husbandry 202 Dairying	2	2
English 301 Argumentation	1	0	Civil Engineering 305 Mechanics of Materials	3	0
Electrical Eng. 305 Electrical Machinery	3	3	Civil Engineering 328 Materials Laboratory	0	2
*Elective	3		Economics 403 Principles	3	0
	16	11	English ~~303~~ 304 Argumentation	2	0
			*Elective	3	
				17	8

SUMMER WORK

Civil Engineering 300, Field Practice, three weeks

SENIOR YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Agricultural Economics 411	2	2	Agricultural Eng. 410	2	4
Agricultural Economics			Irrigation		
Agricultural Eng. 413	2	3	Agricultural Eng. 416	2	4
Farm Buildings			Drainage		
Civil Engineering 311	3	2	Agricultural Eng. 418	2	4
Hydraulics			Designing of Farm Structures		
English 401	1	0	Agricultural Eng. 402	2	4
Public Speaking			Automobiles and Trucks		
*Elective	10		Civil Engineering 334	2	0
			Contracts and Specifications		
	18	7	English 402	1	0
			Public Speaking		
			*Elective	3	
				14	16

(For the classes of 1926 and 1927)

JUNIOR YEAR

Agronomy 301	3	2	Agricultural Eng. 201	2	2
Soils			Farm Machinery		
Animal Husbandry 101	0	4	Agronomy ~~308~~ 307	2	2
Market Types			Forage Crops		
Civil Engineering 201	3	4	Animal Husbandry 102	0	4
Plane Surveying			Market Types		
English 303	2	0	Civil Engineering 305	3	0
Argumentation			Mechanics of Materials		
Electrical Engineering 305	3	3	Civil Engineering 328	0	2
Electrical Machinery			Materials Laboratory		
Mechanical Engineering 309	0	3	History ~~306~~ 305	3	0
Machine Shop			Citizenship		
*Elective	3		Horticulture 202	2	2
			Vegetable Gardening		
	14	16	*Elective	3	
				15	12

*To be chosen from List A, page 115

SUMMER WORK

Civil Engineering 300, Field Practice, three weeks.

SENIOR YEAR

Agricultural Eng. 413	2	3	Agricultural Eng. 410	2	~~2~~ 4
Farm Buildings			Irrigation		
Civil Engineering 311	3	2	Agricultural Eng. 416	2	4
Hydraulics			Drainage		
Civil Engineering 407	3	0	Agricultural Eng. 418	2	4
Roads and Pavements			Designing of Farm Structures		
Economics 403	3	0	Agricultural Eng. 402	2	4
Fundamental Principles			Automobiles and Trucks		
English 401	1	0	Civil Engineering 334	2	0
Public Speaking			Contracts and Specifications		
*Elective	7		English 402	1	0
			Public Speaking		
	19	5	*Elective	3	
				14	~~11~~ 16

*To be chosen from List A, page 115

XX.—COURSE IN LANDSCAPE ART

FRESHMAN YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Agronomy 105 Fundamentals of Crop Production	3	2	Animal Husbandry 102 Market Types	0	4
Animal Husbandry 101 Market Types	0	4	Biology 102 General Botany	2	4
Biology 101 General Botany	2	4	Chemistry 102 Inorganic	3	3
Chemistry 101 Inorganic	3	3	English 104 Rhetoric and Composition	3	0
Dairy Husbandry 101 Judging Dairy Cattle	0	2	Mathematics 108 Agricultural	3	0
English 103 Rhetoric and Composition	3	0	Military Science 102 or 104	1	2
Military Science 101 or 103	1	2	Textile Engineering 102 Cotton Classing	0	2
	12	17		12	15

SOPHOMORE YEAR

Architecture 101 Architectural Drawing	0	4	Agricultural Education 207 Psychology	3	0
Architecture 109 Freehand Drawing	0	3	Architecture 104 Shades and Shadows	2	0
Drawing 103 a Descriptive Geometry	2	0	Architecture 110 Freehand Drawing	0	3
English 203 Adv. Composition	2	0	English 204 Adv. Composition	2	0
Entomology 201 General	2	2	Horticulture 208 Ornamentals	2	2
Geology 201 General	3	2	Horticulture ~~210~~ 302 History of Landscape Art	2	0
Horticulture 201 Plant Propagation	2	2	Military Science 202 or 204	1	2
Military Science 201 or 203	1	2	*Elective	5	
	12	15		17	7

JUNIOR YEAR

Agricultural Engineering 305 Surveying and Drainage	3	4	Architecture 206 Freehand Drawing	0	4
Agronomy 301 Soils	3	2	Economics 403 Principles	3	0
Architecture 205 Freehand Drawing	0	4	English ~~303~~ 304 Argumentation	2	0
English 301 Argumentation	1	0	Horticulture ~~308~~ 316 Landscape Design	0	8
Horticulture 307 Introduction to Landscape Art	2	4	Horticulture 314 Floriculture	2	2
*Elective	4		*Elective	6	
	13	14		13	14

SENIOR YEAR

English 401 Public Speaking	1	0	English 402 Public Speaking	1	0
Horticulture 303 Fruit Growing	3	2	Horticulture 416 Advanced Design	3	8
Horticulture 415 Advanced Design	3	8	Horticulture 420 Experimental	0	4
Horticulture 419 Experimental	1	0	Economics 316 Business Law	3	0
*Elective	8		*Elective	7	
	16	10		14	12

*Junior and Senior Electives

Junior electives must bear course numbers above 200 and senior electives must bear course numbers above 300.

C.—TWO-YEAR COURSE IN AGRICULTURE

FIRST YEAR

First Term	Hours per week Th.	Pr.
Agricultural Engineering 201 — Farm Machinery	2	2
Agronomy 25 — Soils	3	2
Animal Husbandry 23 — Market Types	0	4
Dairy Husbandry 23 — Farm Dairying	3	2
English 103 — Rhetoric and Composition	3	0
Horticulture 21 — Plant Culture and Propagation	2	2
Military Science 101	1	2
Textile Engineering 101 — Cotton Classing	0	2
	14	16

Second Term	Hours per week Th.	Pr.
Agronomy 30 — Elementary Crop Production	3	2
Animal Husbandry 24 — Market Types	0	4
English 104 — Rhetoric and Composition	3	0
Entomology 22 — Elementary Econ. Ent.	2	2
Military Science 102	1	2
Textile Engineering 102 — Cotton Classing	0	2
*Elective	6	
	15	12

*To be chosen from the following:

Agricultural Engineering 203 — Gas Engines	2	2
Horticulture 202 — Vegetable Gardening	2	2
Poultry Husbandry 102 — Farm Poultry	2	2

SECOND YEAR

Eighteen term-hours each term from the following in addition to Military Science.

Agricultural Eng. 305 — Surveying and Drainage	3	4
Agricultural Eng. 203 — Gas Engines	2	2
Agricultural Eng. 321 — Farm Shop	~~0~~ 1	~~3~~ 4
Agricultural Eng. 409 — Farm Concrete	1	2
Animal Husbandry 55 — Live Stock Feeding	2	2
~~English 103 — Rhetoric and Composition~~	~~3~~	~~0~~
Horticulture 53 — Tree and Vine Fruits	3	2
Military Science 201	1	2
Agricultural Eng. 214 — Tractors	2	4
Agricultural Eng. 322 — Farm Shop	~~0~~ 1	~~3~~ 4
Agricultural Eng. 402 — Automobiles and Motor Trucks	2	4
Agricultural Eng. 410 — Irrigation	2	4
Animal Husbandry 52 — Breeding	2	2
Animal Husbandry 58 — Live Stock Management	2	2
Animal Husbandry 202 — Breed Types	2	2
~~English 104 — Rhetoric and Composition~~	~~3~~	~~0~~
Entomology 56 — Apiculture	2	2
Horticulture 304 — Nut Culture	1	4
Military Science 202	1	2
Veterinary Anatomy 306 — Animal Diseases	3	2

THE SCHOOL OF ARTS AND SCIENCES

XIX.—COURSE IN LIBERAL ARTS

(Leading to the Degree of Bachelor of Arts)

The first two years of the Course in Liberal Arts are spent in introductory work in varied fields. The purpose of this plan is to give the student breadth of view, and to enable him to take a more intelligent part in his own education. During the two upper years the student chooses his own field of work under the advice and direction of the Dean of the School of Arts and Sciences.

FRESHMAN YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
*Chemistry 103 Inorganic	3	4	*Chemistry 104 Inorganic	3	4
English 105 Rhetoric and Composition	4	0	English 106 Rhetoric and Composition	4	0
History 101 Western Europe	3	0	History 102 Western Europe	3	0
Mathematics 101 Algebra	3	0	Mathematics 103 or104 Trigonometry or ~~Algebra~~	3	0
Military Science	1	2	Military Science	1	2
Modern Language French, German or Spanish	3	0	Modern Language French, German or Spanish	3	0
	17	6		17	6

*Or Physics 201, 202 (3-2), College Physics.

SOPHOMORE YEAR

**Biology 211 General Biology	2	4	**Biology 212 General Biology	2	4
Economics 203 Principles of Economics	3	0	Economics 204 Principles of Economics	3	0
English 231 English Literature	3	0	English 232 English Literature	3	0
Military Science	1	2	Military Science	1	2
Modern Language French, German or Spanish	3	0	Modern Language French, German or Spanish	3	0
*Elective	3		*Elective	3	
	15	6		15	6

**Or Biology 103, 104, or Biology 203, 204.

JUNIOR YEAR

English 321 Nineteenth Century Literature	3	0	English 322 Nineteenth Century Literature	3	0
*Elective	15		*Elective	15	
	18	0		18	0

SENIOR YEAR

English 401 Public Speaking	1	0	English 402 Public Speaking	1	0
English 413 Contemporary Literature	2	0	English 414 Contemporary Literature	2	0
*Elective	15		*Elective	15	
	18	0		18	0

SPECIAL REQUIREMENTS

1. By April of his Sophomore year, the student must designate the department in which he will take his major study and the department in which he will take his minor study.

2. Before graduation he must complete in his major study at least 18 term hours, and in his minor study at least 12 term hours, not including the prescribed subjects of the freshman and sophomore years. The remainder of the elective work may be chosen from any of the departments listed below.

3. The foreign language taken in the Freshman year must be continued in the Sophomore year.

4. Students who do not present a foreign language for admission must take a minimum of 18 term hours in one foreign language; others will take a minimum of 12 term hours.

DEPARTMENTS IN WHICH MAJOR AND MINOR STUDIES, AND ELECTIVES MAY BE CHOSEN:

Group 1, *Social Sciences.*—Economics, Agricultural Economics, History (including Government), Rural Sociology, Agricultural Education, Physical Education, Rural Education.

Group 2, *Natural Science and Mathematics.*—Biology (Botany, Bacteriology, Zoology), Entomology, Genetics, Chemistry, Geology, Mathematics, Physics.

Group 3, *Languages.*—English, Modern Languages (French, German, Spanish).

Note.—For sufficient reason, electives may be chosen from other departments of the College, subject to the approval of the Dean of the School of Arts and Sciences.

Pre-Law Course.

(1)

Engl 103-104
Math 101, (103), 104
Hist 213-214
Biol, Chem or Phys
Elective (RS 201 + Hist 306)
MS

(2)

Engl 231-232
Econ 203-204
Hist 211-212
Hist 215-216
Govt 201-202
MS

X.—COURSE IN SCIENCE

FRESHMAN YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Biology 103	2	4	Biology 104	2	4
Botany			Botany		
Chemistry 103	3	4	Chemistry 104	3	4
Inorganic			Inorganic		
English 103	3	0	English 104	3	0
Rhetoric and Composition			Rhetoric and Composition		
Mathematics 101	3	0	Mathematics 103 or 104	3	0
Algebra			Trigonometry or Analytics		
Military Science	1	2	Military Science	1	2
Modern Language	3	0	Modern Language	3	0
French, German or Spanish			French, German or Spanish		
	15	10		15	10

SOPHOMORE YEAR

Biology 203	2	4	Biology 204	2	4
Zoology			Zoology		
English 231	3	0	English 232	3	0
English Literature			English Literature		
Military Science	1	2	Military Science	1	2
Modern Language	3	0	Modern Language	3	0
French, German or Spanish			French, German or Spanish		
Physics 201	3	2	Physics 202	3	2
College Physics			College Physics		
*Elective	4		*Elective	4	
	16	8		16	8

JUNIOR YEAR

Economics 203	3	0	Economics 204	3	0
Principles			Principles		
English 321	3	0	English 322	3	0
Nineteenth Century Literature			Nineteenth Century Literature		
*Elective	14		*Elective	14	
	20	0		20	0

SENIOR YEAR

English 401	1	0	English 402	1	0
Public Speaking			Public Speaking		
English 413	2	0	English 414	2	0
Contemporary Literature			Contemporary Literature		
*Elective	17		*Elective	17	
	20	0		20	0

SPECIAL REQUIREMENTS

1. By April 15 of his sophomore year, the student must designate as his major department one of the following: Biology (botany, zoology, bacteriology), Chemistry, Entomology, Geology, Physics.

2. Before graduation the student must complete in his major department at least twenty-four hours, not including prescribed subjects.

3. The student who chooses Physics as his major department must include in his electives Mathematics 104, 203, 204.

4. The foreign language taken in the freshman year must be continued in the sophomore year.

5. Students who do not present a foreign language for admission must take a minimum of 18 term hours in one foreign language; others will take a minimum of 12 term hours.

ELECTIVE SUBJECTS FOR THE SOPHOMORE YEAR

The following elective subjects are open to sophomores in the Science Course:

Chemistry 205; Chemical Engineering 202, Qualitative and Quantitative Analysis.

Chemistry 207, 208; Quantitative Analysis, Technical Analysis.

Chemistry 301, 302, Organic Chemistry.

Entomology 201, 202, 312, Systematic, Economic, Medical Entomology.

Geology 201, 202, Physical and Historical Geology.

Agricultural Education 207, Psychology.

Drawing 219, 220, Freehand Drawing.

Mathematics 104, 203, 204, Analytic Geometry, Calculus

For the junior and senior years the electives are to be chosen in the Departments listed under groups 1, 2 and 3, page 99, subject to the Special Requirements noted above.

THE SCHOOL OF ENGINEERING

COURSES IN ENGINEERING

(The Curricula for all engineering courses are identical in the Freshman Year)

FRESHMAN YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Chemistry 101 Inorganic	3	3	Chemistry 102 Inorganic	3	3
Drawing 101 Mechanical	0	2	Drawing 104 Descriptive Geometry	2	2
Drawing 103 Descriptive Geometry	3	0	Drawing 108 Mechanical	0	2
English 105 Rhetoric and Composition	4	0	English 106 Rhetoric and Composition	4	0
Mathematics 101 Algebra	3	0	Mathematics 102 Algebra	3	0
Mathematics 103 Trigonometry	3	0	Mathematics 104 Analytics	3	0
Mechanical Engineering 103 Woodwork	0	3	Mechanical Engineering 104 Forging	0	3
Mil. Sci. 101, 103 or 105	1	2	Mil. Sci. 102, 104 or 106	1	2
	17	10		16	12

IX.—COURSES IN ARCHITECTURE

GROUP 1. GENERAL COURSE

FRESHMAN YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Architecture 101 Architectural Drawing	0	4	Architecture 102 Architectural Drawing	0	4
Chemistry 101 Inorganic	3	3	Architecture 104 Shades and Shadows	2	0
Drawing 103a Descriptive Geometry	2	0	Chemistry 102 Inorganic	3	3
Architecture 109 Freehand Drawing	0	3	Architecture 110 Freehand Drawing	0	3
English 105 Rhetoric and Composition	4	0	English 106 Rhetoric and Composition	4	0
Mathematics 101 Algebra	3	0	Mathematics 102 Algebra	3	0
Mathematics 103 Trigonometry	3	0	Mathematics 104 Analytics	3	0
Mil. Sci. 101, 103 or 105	1	2	Mil. Sci. 102, 104 or 106	1	2
	16	12		16	12

SOPHOMORE YEAR

Architecture 201 Design	0	10	Architecture 202 Design	0	14
Architecture 203 Principles of Perspective	1	0	Architecture 208 History	2	0
Architecture 207 History	2	0	Architecture 218 Mechanics of Materials	3	0
Architecture 217 Elements of Mechanics	3	0	Architecture 206 Freehand Drawing	0	4
Architecture 205 Freehand Drawing	0	4	English 204 Adv. Composition	2	0
English 203 Adv. Composition	2	0	Physics 204 General	3	3
Physics 203 General	3	3	Military Science 203 or 204	1	2
Military Science 201 or 203	1	2		11	23
	12	19			

SUMMER WORK

Architecture 300, Working Drawings, three weeks

JUNIOR YEAR

Architecture 301 Design	0	15	Architecture 302 Design	0	15
Architecture 309 History	2	0	Architecture 316 Mechanical Equipment	3	0
Architecture 317 Framed Construction	2	3	Architecture 318 Reinforced Concrete	3	3
Architecture 305 Freehand Drawing	0	4	Architecture 306 Freehand Drawing	0	4
English 303 Argumentation	2	0	Modern Language 102 French	3	0
Modern Language 101 French	3	0	*Elective	3	
*Elective	3			12	22
	12	22			

*To be chosen from List A, page 115

Or History ~~306~~, Citizenship. (Second Term).

SUMMER WORK

Architecture 400, Working Drawings, three weeks

SENIOR YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Architecture 401 Design	0	18	Architecture 402 Design	0	20
Architecture 407 History of Art	2	0	Architecture 406 Professional Practice	2	0
Architecture 409 Freehand Drawing	0	4	Architecture 414 Modern Architecture	1	0
Economics 403 Fundamental Principles	3	0	Architecture 410 Freehand Drawing	0	4
English 401 Public Speaking	1	0	English 402 Public Speaking	1	0
Modern Language 201 French	3	0	Modern Language 202 French	3	0
*Elective	3		*Elective	3	
	12	22		10	24

*To be chosen from List A, page 115, or Economics 408.

GROUP 2. STRUCTURAL COURSE

FRESHMAN YEAR

Same as in Group 1.

SOPHOMORE YEAR

Architecture 201a Design	0	8	Architecture 202a Design	0	4
Architecture 203 Principles of Perspective	1	0	Architecture 208 History	2	0
Architecture 207 History	2	0	Civil Engineering 204 Analytic Mechanics	3	0
Architecture 205 Freehand Drawing	0	4	Mathematics 204 Calculus	5	0
Mathematics 203 Calculus	5	0	English 204 Adv. Composition	2	0
English 203 Adv. Composition	2	0	Physics 204 General	3	3
Physics 203 General	3	3	Military Science 202 or 204	1	2
Military Science 201 or 203	1	2			
	14	17			

SUMMER WORK

Architecture 300, Working Drawings, three weeks

JUNIOR YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Architecture 311 Design	0	12	Architecture 312 Design	0	12
Architecture 305 Freehand Drawing	0	4	Architecture 316 Mechanical Equipment	3	0
Architecture 309 History of Architecture	2	0	Civil Engineering 330a Framed Structures	3	3
Civil Engineering 305 Mechanics of Materials	3	0	Civil Engineering 206 Surveying	1	3
Civil Engineering 315 Materials Laboratory	0	2	Architecture 306 Freehand Drawing	0	4
English 303 Argumentation	2	0	*Elective	3	
Mechanical Engineering 205 Elementary Steam Engineering	2	0		10	22
*Elective	3				
	12	18			

*To be chosen from List A, page 115, or History ~~306~~ 305

SUMMER WORK

Architecture 400, Working Drawings, three weeks

SENIOR YEAR

Architecture 411 Structural Design	0	14	Architecture 412 Structural Design	2	17
Architecture 407 History of Art	2	0	Architecture 414 Modern Architecture	1	0
Civil Engineering 413 Elements of Reinf. Concrete	2	0	Architecture 406 Professional Practice	2	0
Economics 403 Fundamental Principles	3	0	Electrical Engineering 436 Wiring and Lighting	3	0
English 401 Public Speaking	1	0	English 402 Public Speaking	1	0
Geology 201 General	3	2	*Elective	3	
*Elective	3			12	17
	14	16			

*To be chosen from List A, page 115, or Economics 408

VIII.—COURSE IN CHEMICAL ENGINEERING

FRESHMAN YEAR

See page 102

SOPHOMORE YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Chemistry 205 Qualitative Analysis	2	8	Chemical Engineering 202 Quantitative Analysis	2	8
Drawing 201 Mechanical	0	2	Drawing 202 Mechanical	0	2
English 203 Adv. Composition	2	0	English 204 Adv. Composition	2	0
Mathematics 203 Calculus	5	0	Mathematics 204 Calculus	5	0
Military Science 201 or 203	1	2	MilitaryScience 202 or 204	1	2
Physics 203 General	3	3	Physics 204 General	3	3
	13	15		13	15

JUNIOR YEAR

Chemical Engineering 301 Quantitative Analysis	2	8	Chemistry 302 Organic	3	4
Chemistry 301 Organic	3	4	~~Civil Engineering 206 Plane Surveying~~	~~1~~	~~3~~
History 305 Citizenship	3	0	Electrical Engineering 305 Electrical Machinery	3	3
Mechanical Engineering 319 Engines and Boilers	4	0	English 303 Argumentation	2	0
*Elective	3		Mechanical Engineering 320 Thermodynamics	4	0
	15	12	*Elective	3	
				16	10

*To be chosen from the following:

Civil Engineering 311 Hydraulics	3	2	One Subject from List A	3	0
~~One Subject from List A~~	~~3~~	~~0~~			

SENIOR YEAR

Chemical Engineering 411 Physical Chemistry	5	0	Chemical Engineering 416 Chemical Technology	3	4
Chemical Engineering 415 Industrial Chemistry	3	6	Chemical Eng. 418 Physical Chemistry	1	8
Economics 403 Fundamental Principles	3	0	Chemistry 438 Seminar	1	0
English 401 Public Speaking	1	0	Economics 316 Business Law	3	0
Mechanical Engineering 403 Laboratory	0	4	English 402 Public Speaking	1	0
*Elective	3		Mechanical Engineering 404 Laboratory	0	4
	15	10	*Elective	3	
				12	16

*To be chosen from List A, page 115.

IV.—COURSE IN CIVIL ENGINEERING

FRESHMAN YEAR

See page 102.

SOPHOMORE YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Civil Engineering 201 Surveying	3	4	Civil Engineering 202 Railroad Engineering	3	3
Drawing 201 Mechanical	0	2	Civil Engineering 204 Analytic Mechanics	3	0
English 203 Adv. Composition	2	0	Drawing 202 Mechanical	0	2
Mathematics 203 Calculus	5	0	English 204 Adv. Composition	2	0
Mechanical Eng. 205 Elementary Steam Engineering	2	0	Mathematics 204 Calculus	5	0
Military Science 201 or 203	1	2	Military Science 202 or 204	1	2
Physics 203 General	3	3	Physics 204 General	3	3
	16	11		17	10

SUMMER WORK

Civil Engineering 300, Field Practice, three weeks

JUNIOR YEAR

Civil Engineering 303 Railroad Engineering	2	3	Civil Engineering 334 Contracts and Specifications	2	0
Civil Engineering 305 Mechanics of Materials	3	0	Civil Engineering 306 Masonry	2	0
Civil Engineering 311 Hydraulics	3	2	Civil Engineering 320 Topographic Drawing	0	2
Civil Engineering 315 Materials Laboratory	0	2	Civil Engineering 330 Framed Structures	3	6
Electrical Engineering 305 Electrical Machinery	3	3	Geology 201 General	3	2
English 303 Argumentation	2	0	History 305 Citizenship	3	0
*Elective	3		*Elective	3	
	16	10		16	10

*To be chosen from List A, page 115

SUMMER WORK

Civil Engineering 400, Field Practice, three weeks

GROUP 1. GENERAL CIVIL ENGINEERING

SENIOR YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Civil Engineering 401 — Railroad Drafting	0	3	Civil Engineering 404 — Bridge Design	0	4
Civil Engineering 403 — Roofs and Bridges	3	6	Civil Engineering 414 — Reinforced Concrete Design	1	5
Civil Engineering 407 — Roads and Pavements	3	0	~~Civil Engineering 440~~ — Sanitary Engineering	4	2
Civil Engineering 413 — El. of Reinforced Concrete	2	0	Civil Engineering 448 — Engineering Economics	2	2
Civil Engineering 443 — Materials of Construction	~~2~~ 1	~~3~~	English 402 — Public Speaking	1	0
Economics 403 — Fundamental Principles	3	0	*Elective	6	
English 401 — Public Speaking	1	0		14	13
*Elective	3				
	~~15~~ 16	~~13~~ 12			

*To be chosen from the following:

Geology 401 — Engineering Geology	2	3	Civil Engineering 434 — Irrigation and Drainage	3	0
One Subject from List A	3		Civil Engineering 446 — Highway Administration	3	0
			Municipal and San. Eng. 406 — Sanitation and Public Health	3	0
			One Subject from List A	3	

GROUP 2. HIGHWAY AND MUNICIPAL ENGINEERING

Civil Engineering 401 — Railroad Drafting	0	3	Civil Engineering 414 — Reinforced Concrete Design	1	5
Civil Engineering 407 — Roads and Pavements	3	0	Civil Engineering 418 — Highway Materials	1	3
Civil Engineering 413 — El. of Reinforced Concrete	2	0	~~Civil Engineering 440~~ — Sanitary Engineering	4	2
Civil Engineering 417 — Highway Materials	2	3	Civil Engineering 448 — Engineering Economics	2	2
Civil Engineering 423 — Bridge Design	2	4	English 402 — Public Speaking	1	0
Economics 403 — Fundamental Principles	3	0	*Elective	6	
English 401 — Public Speaking	1	0		15	12
*Elective	3				
	16	10			

*To be chosen from the following:

Geology 401 — Engineering Geology	2	3	Civil Engineering 434 — Irrigation and Drainage	3	0
One Subject from List A	3		Civil Engineering 446 — Highway Engineering	3	0
			Economics 408 — Corporation Finance	3	0
			Municipal and San. Eng. 406 — Sanitation and Public Health	3	0
			One Subject from List A	3	

*To be chosen from List A, page 115

GROUP 3. MUNICIPAL AND SANITARY ENGINEERING

SENIOR YEAR

First Term	Hours per week Th.	Pr.
Chemistry 441	2	3
Chemical Testing Water & Sewage		
Civil Engineering 407	3	0
Roads and Pavements		
Civil Engineering 443	~~3~~ 1	~~3~~ 3
Materials of Construction		
Economics 403	3	0
Fundamental Principles		
English 401	1	0
Public Speaking		
Municipal and San. Eng 401	3	0
Sewerage and Sewage Disposal		
Municipal and San. Eng. 403	0	4
Sanitary Design		
*Elective	3	
	~~15~~ 16	~~11~~ 10

Second Term	Hours per week Th.	Pr.
Biology 418	1	4
Water Bacteriology		
Civil Engineering 450	3	3
Reinforced Concrete Const.		
English 402	1	0
Public Speaking		
Municipal and San. Eng. 402	3	0
Water Supply and Purification		
Municipal and Sanitary Eng. 404	0	4
Sanitary Design		
Municipal and San. Eng. 406	3	0
Sanitation and Public Health		
Municipal and San. Eng. 408	2	0
Municipal Administration		
*Elective	3	
	16	11

V.—COURSE IN ELECTRICAL ENGINEERING

FRESHMAN YEAR

See page 102.

SOPHOMORE YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Drawing 201 Mechanical	0	2	Civil Engineering 206 Surveying	1	3
Electrical Engineering 201 Electricity and Magnetism	4	4	Drawing 202 Mechanical	0	2
English 203 Adv. Composition	2	0	Electrical Engineering 202 Elementary	2	4
Mathematics 203 Calculus	5	0	English 204 Adv. Composition	2	0
Mechanical Engineering 201 Pattern Making and Foundry	0	3	Mathematics 204 Calculus	5	0
Mil. Sci. 201, 203 or 205	1	2	Mechanical Eng. 214 Machine Shop	0	3
Physics 207 General	3	2	Mil. Sci. 202, 204 or 206	1	2
	15	13	Physics 208 General	3	2
				14	16

JUNIOR YEAR

Electrical Engineering 301 Direct Currents	4	6	Civil Engineering 328 Materials Laboratory	0	2
English 303 Argumentation	2	0	Civil Engineering 305 Mechanics of Materials	3	0
History 305 Citizenship	3	0	Electrical Engineering 302 Alternating Currents	5	6
Mechanical Engineering 207 Kinematics	2	2	Mechanical Eng. 302 Steam Engines and Boilers	4	0
Mechanical Engineering 317 Engineering Mechanics	3	0	Mechanical Engineering 318 Engineering Mechanics	2	0
*Elective	3		*Electives	3	
	17	8		17	8

*To be chosen from List A, page 115.

Note.—If Military Science 305, 306 be chosen, it must be accompanied by Electrical Engineering 309, 310.

SENIOR YEAR

First Term	Hours per week Th.	Pr.
Economics 403 Fundamental Principles	3	0
Electrical Engineering 401 A. C. Machinery	4	7
Electrical Engineering 431 Engineering Administration	2	0
English 401 Public Speaking	1	0
Mechanical Engineering 415 Laboratory	0	3
*Elective	6	
	16	10

Second Term	Hours per week Th.	Pr.
Electrical Engineering 402 A. C. Machinery	4	6
Electrical Engineering 432 Public Utility Problems	3	0
English 402 Public Speaking	1	0
Mechanical Engineering 416 Laboratory	0	3
*Elective	9	
	17	9

*To be chosen from the following:

Civil Engineering 411 Hydraulics	3	0
Electrical Engineering 427 Telephony	2	2
Electrical Engineering 425 Illumination Engineering	2	2
Electrical Engineering 409 Communication Engineering	2	2
*Elective	3	
Mech. Eng. 407 Refrigeration	2	0

Electrical Engineering 424 Electric Railways	2	2
Electrical Engineering 406 Power Transmission	3	0
Electrical Engineering 410 Communication Engineering	1	2
Electrical Engineering 434 Design and Construction	1	4
Electrical Engineering 438 Theory of Alternating Currents	3	0
Geology 201 General	3	2
Mathematics 502 Differential Equations	3	0
*Elective	3	
EE 410 Radio Communication	3	0

*Electives must include one subject each term from List A, page 115. If Military Science 405, 406 be chosen, it must be accompanied by Electrical Engineering 409, 410.

III.—COURSE IN MECHANICAL ENGINEERING

FRESHMAN YEAR

See page 102.

SOPHOMORE YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Chemistry 207 Quanitative Analysis	2	3	Chemistry 208 Technical Analysis	1	3
English 203 Adv. Composition	2	0	English 204 Adv. Composition	2	0
Mathematics 203 Calculus	5	0	Mathematics 204 Calculus	5	0
Mechanical Eng. 201 Pattern Making and Foundry	0	3	Mechanical Eng. 202 Pattern Making and Foundry	0	3
Mechanical Eng. 207 Kinematics	2	2	Mechanical Eng. 212 Engineering Mechanics	3	0
Mil. Sci. 201, 203 or 205	1	2	Mil. Sci. 202, 204 or 206	1	2
Physics 203 General	3	3	Physics 204 General	3	3
	15	13		15	11

JUNIOR YEAR

Civil Engineering 305 Mechanics of Materials	3	0	Civil Engineering 328 Materials Laboratory	0	2
Electrical Engineering 307 Electrical Machinery	3	0	Electrical Engineering 308 Electrical Machinery	2	3
English 303 Argumentation	2	0	History 305 Citizenship	3	0
Mechanical Engineering 319 Engines and Boilers	4	0	Mechanical Engineering 320 Thermodynamics	4	0
Mechanical Engineering 303 Machine Design	0	3	Mechanical Engineering 304 Machine Design	0	4
Mechanical Engineering 313 Engineering Mechanics	3	0	Mechanical Engineering 314 Engineering Mechanics	3	0
Mechanical Engineering 309 Machine Shop	0	3	Mechanical Engineering 310 Machine Shop	0	3
*Elective	3		*Elective	3	
	18	6		15	12

*To be chosen from List A, page 115.

SENIOR YEAR

Required in all groups.

Chemical Engineering 407 Industrial Chemistry	3	0	Chemical Engineering 408 Metallurgy	2	0
Civil Engineering 411 Hydraulics	3	0	English 402 Public Speaking	1	0
Economics 403 Fundamental Principles	3	0	Mechanical Engineering 404 Laboratory	0	4
English 401 Public Speaking	1	0	Mechanical Engineering 410 Gas Engines	3	0
Mechanical Engineering 403 Engineering Laboratory	0	4	Mechanical Engineering 412 History and Biography	3	0
	10	4		9	4

GROUP 1. POWER

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Mechanical Engineering 407 Refrigeration	2	0	Mechanical Engineering 414 Steam Turbines	2	0
Mechanical Engineering 417 Power Plants and Equipment	2	4	Mechanical Engineering 418 Power Plants and Equipment	2	4
*Elective	3		*Elective	3	
	7	4		7	4

GROUP 2. INDUSTRIAL ENGINEERING

Mechanical Engineering 419 Industrial Engineering	3	2	Mechanical Engineering 420 Industrial Engineering	3	2
Mechanical Engineering 421 Methods and Management	2	0	Mechanical Engineering 422 Methods and Management	2	0
*Elective	3		*Elective	3	
	8	2		8	2

GROUP 3. TRANSPORTATION

Mechanical Engineering 423 Transportation	2	0	Mechanical Engineering 424 Transportation	2	0
Mechanical Engineering 425 Railway Mech. Engineering	2	4	Mechanical Engineering 426 Railway Mech. Engineering	2	4
*Elective	3		*Elective	3	
	7	4		7	4

*To be chosen from List A, page 115, or any other approved elective.

VI.—COURSE IN TEXTILE ENGINEERING

FRESHMAN YEAR

See page 102

SOPHOMORE YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Chemistry 207 Quantitative Analysis	2	3	Chemistry 208 Technical Analysis	1	3
Drawing 201 Mechanical	0	2	Civil Engineering 206 Surveying	1	3
English 203 Adv. Composition	2	0	Drawing 202 Mechanical	0	2
*Mathematics 203 Calculus	5	0	English 204 Adv. Composition	2	0
Mechanical Eng. 205 Elem. Steam Engineering	2	0	Mechanical Eng. 208 Kinematics	2	2
Military Science	1	2	Military Science	1	2
Physics 203 General	3	3	Physics 204 General	3	3
Textile Engineering 207 Weaving	0	3	Textile Engineering 206 Yarn Manufacture	0	3
	15	13		10	18

*Or Agricultural Economics 201, Accounting; and Agricultural Economics 202, Accounting.

JUNIOR YEAR

Chemistry 206 Organic	3	2	Chemistry 308 Dyeing	2	4
Electrical Engineering 307 Electrical Machinery	3	0	Electrical Engineering 308 Electrical Machinery	2	3
Mechanical Eng. 309 Machine Shop	0	3	English 303 Argumentation	2	0
Textile Engineering 301 Yarn Manufacture	2	3	History 305 Citizenship	3	0
Textile Engineering 303 Fabric Design	0	3	Textile Engineering 302 Yarn Manufacture	0	2
Textile Engineering 307 Weaving	3	3	Textile Engineering 304 Fabric Design	0	3
*Elective	3		Textile Engineering 306 Weaving	3	3
	14	14	*Elective	3	
				15	15

*To be chosen from List A, page 115

SENIOR YEAR

First Term	Hours per week Th.	Pr.
Agricultural Education 207 Psychology	3	0
Economics 403 Fundamental Principles	3	0
English 401 Public Speaking	1	0
Textile Engineering 401 Yarn Manufacture	3	2
Textile Engineering 413 Cotton Classing	1	2
Textile Engineering 415 Fabric Design	0	3
Textile Engineering 419 Weaving	1	2
*Elective	6	
	18	9

Second Term	Hours per week Th.	Pr.
Economics ~~311~~ 316 ~~Money and Banking~~ Business Law	3	0
English 402 Public Speaking	1	0
Textile Engineering 402 Yarn Manufacture	2	3
Textile Engineering 404 Fabric Analysis	1	0
Textile Engineering 410 Mill Management	2	0
Textile Engineering 412 Magazine Review	1	0
Textile Engineering 414 Cotton Classing	0	2
Textile Engineering 416 Fabric Design	0	3
Textile Engineering 420 Weaving	0	3
*Elective	6	
	16	11

*Two subjects each term from List A.

LIST A

Junior and Senior electives common to all engineering courses.

English 321 Nineteenth Century Literature	3	0
English 403 Public Speaking	3	0
History 311 Modern and Contemporary Europe	3	0
*Military Science	3	2
Modern Languages French, German or Spanish	3	0
Economics 408 Corporation Finance	3	0

English 322 Nineteenth Century Literature	3	0
English 404 Public Speaking	3	0
History 312 Modern and Contemporary Europe	3	0
*Military Science	3	2
Modern Languages French, German or Spanish	3	0

*Notes.—1. If Military Science 305, 306, and Military Science 405, 406, are elected they must be accompanied by Electrical Engineering 309, 310, and Electrical Engineering 409, 410, respectively.

2. Students who desire to substitute English ~~221~~ 321 or ~~223~~ 322 for English 303 may do so with the consent of the Dean provided they have the requisite grade points.

XVII.—TWO-YEAR COURSE IN TEXTILE ENGINEERING

FIRST YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Chemistry 101 Inorganic	3	3	Agricultural Education 207 Psychology	3	0
Drawing 101 Mechanical	0	2	English 106 Rhetoric and Composition	4	0
English 105 Rhetoric and Composition	4	0	Chemistry 102 Inorganic	3	3
Mathematics 101 Algebra	3	0	Mechanical Engineering 104 Forging	0	3
Mathematics 103 Trigonometry	3	0	Mil. Sci., 102, 104 or 106	1	2
Military Sci., 101, 103 or 105	1	2	Textile Engineering 102 Cotton Classing	0	2
Textile Engineering 103 Weaving	0	3	Textile Engineering 112 Yarn Manufacture	3	3
Textile Engineering 111 Yarn Manufacture	0	3	Textile Engineering 104 Weaving	0	3
	14	13		14	16

SECOND YEAR

Chemistry 206 Organic	3	2	Chemistry 308 Dyeing	2	4
Mechanical Eng. 205 Elem. Steam Engineering	2	0	Mechanical Eng. 214 Machine Shop	0	3
Mechanical Eng. 207 Kinematics	2	2	Military Science 202 or 204	1	2
Military Science 201 or 203	1	2	Textile Engineering 304 Fabric Designing	0	3
Textile Engineering 303 Fabric Designing	0	3	Textile Engineering 402 Yarn Manufacture	2	3
Textile Engineering 307 Weaving	3	13	Textile Engineering 404 Fabric Analysis	1	0
Textile Engineering 413 Cotton Classing	1	2	Textile Engineering 306 Weaving	3	3
Textile Engineering 417 Yarn Manufacture	3	0	Textile Engineering 410 Mill Management	2	0
	15	~~13~~ 14	Textile Engineering 412 Magazine Review	1	0
			Textile Engineering 414 Cotton Classing	0	2
				12	20

XVIII.—TWO YEAR COURSE IN COTTON MARKETING AND CLASSING

FIRST YEAR

First Term	Hours per Week Th.	Pr.	Second Term	Hours per Week Th.	Pr.
Agricultural Economics 101 — Agricultural Resources	3	0	Agricultural Economics 102 — Agricultural Resources	3	0
English 105 — Rhetoric and Composition	4	0	~~Agricultural Education 207~~ — ~~Psychology~~	~~3~~	~~0~~
Mathematics 101 — Algebra	3	0	English 106 — Rhetoric and Composition	4	0
Mil. Sci., 101, 103 or 105	1	2	Mathematics 102 — Algebra	3	0
Textile Engineering 301 — Yarn Manufacture	~~1~~ 0	3	Military Science 102, 104 or 106	1	2
~~Textile Engineering 105~~ — ~~Cotton Office Methods~~	~~3~~	~~0~~	Textile Engineering 108 — Cotton Classing	~~1~~ 2	5
Textile Engineering 107 — Cotton Classing	~~1~~ 2	5	~~Textile Engineering 114~~ — ~~Cotton Exchanges~~	~~3~~	~~0~~
Chem 101 — Inorganic	3	3	Chem 102 — Inorganic	3	3
	~~16~~ 16	~~10~~ 13		~~17~~ 16	~~7~~ 10

SECOND YEAR

Agricultural Economics 201 — Principles of Accounting	2	4	Agricultural Economics 202 — Principles of Accounting	2 4	4
Agronomy 201 — Elementary Cotton Production	3	0	Economics 204 — Principles	3	0
Economics 203 — Principles	3	0	Economics 316 — Business Law	3	0
Economics 311 — Money and Banking	3	0	English ~~203~~ 204 — Adv. Composition	2	0
English 203 — Adv. Composition	2	0	History 305 — Citizenship	3	0
Military Science 201 or 203	1	2	Military Science 202 or 204	1	2
Textile Engineering 211 — Cotton Classing	~~1~~ 2	5	Textile Engineering 216 — ~~Stock~~ Markets	3	0
Textile Engineering 217 — ~~Foreign~~ Cotton Markets	2	0	Textile Engineering 212 — Cotton Classing	~~1~~ 2	5
	16	11		16	11

THE SCHOOL OF VETERINARY MEDICINE

XI.—COURSE IN VETERINARY MEDICINE

FRESHMAN YEAR

First Term	Hours per Week Th.	Pr.	Second Term	Hours per Week Th.	Pr.
Animal Husbandry 101 (Market Types)	0	4	Animal Husbandry 102 (Market Types)	0	4
Biology 101 (General Botany)	2	4	Biology 102 (General Botany)	2	4
Chemistry 101 (Inorganic)	3	3	Chemistry 102 (Inorganic)	3	3
English 103 (Rhetoric and Composition)	3	0	English 104 (Rhetoric and Composition)	3	0
Mil. Sci., 101, 103 or 105	1	2	Mil. Sci. 102, 104 or 106	1	2
Veterinary Anatomy 111 (Anatomy of the Domestic Animals)	3	6	Veterinary Anatomy 112 (Anatomy of the Domestic Animals)	3	6
Vet. Phys. and Phar. 121 (Physiology)	2	0	Vet. Phys. and Phar. 122 (Physiology)	2	0
	14	19		14	19

SOPHOMORE YEAR

Biology 207 (Zoology)	2	4	Biology 206 (Bacteriology)	1	4
English 203 (Adv. Composition)	2	0	Chemistry 206 (Organic)	3	2
Entomology 201 (General)	2	2	English 204 (Adv. Composition)	2	0
Military Science 201 or 203	1	2	Entomology 208 (Animal Parasites)	2	2
Veterinary Anatomy 211 (Anatomy of Domestic Animals)	3	6	Military Science 202 or 204	1	2
Veterinary Anatomy 213 (Histology and Embryology)	2	4	Veterinary Pathology 242 (General)	3	2
Vet. Phys. and Pharm. 221 (Physiology)	2	0	Vet. Phys. and Phar. 222 (Physiology)	3	4
	14	18		15	16

JUNIOR YEAR

Dairy Husbandry 301 (Market Milk)	2	2	English 303 (Argumentation)	2	0
Vet. Med. and Surgery 371 (Clinic)	0	7	Genetics 301 (Genetics)	3	2
Veterinary Medicine 351 (Non-infectious Diseases)	3	0	Vet. Med. and Surgery 372 (Clinic)	0	12
Veterinary Pathology 341 (Special)	2	0	Veterinary Medicine 352 (Non-infectious Diseases)	3	0
Veterinary Pathology 343 (Special Bacteriology)	2	4	Veterinary Pathology 342 (Special)	2	4
Vet. Pharmacology 333 (Pharmacology)	3	4	Vet. Pharmacology 334 (Pharmacology)	3	0
Veterinary Surgery 361 (General)	3	0	Veterinary Surgery 362 (General)	3	0
Elective	3		Elective	3	
	18	17		19	18

SENIOR YEAR

First Term	Hours per Week Th.	Pr.
Animal Husbandry 409 — Animal Nutrition	3	2
English 401 — Public Speaking	1	0
Veterinary Medicine 453 — Infectious Diseases	3	0
Vet. Med. and Surgery 471 — Clinic	0	7
Veterinary Medicine 451 — Diseases of Small Animals and Fowls	3	0
Veterinary Pathology 441 — Immunology and Serum Therapy	2	2
Veterinary Pathology 443 — Parasitology	2	2
Veterinary Surgery 461 — Obstetrics	2	0
Elective	3	
	19	13

Second Term	Hours per Week Th.	Pr.
English 402 — Public Speaking	1	0
Vet. Med. and Surgery 472 — Clinic	0	7
Veterinary Medicine 452 — Practice of Medicine and Jurisprudence	3	0
Veterinary Pathology 444 — Laboratory Diagnosis	2	2
Veterinary Pathology 442 — Meat Hygiene	2	2
Vet. Pharmacology 432 — Toxicology	1	2
Veterinary Surgery 462 — Operative	3	4
Elective	3	
	15	17

XXI.—COURSE IN AGRICULTURE AND VETERINARY MEDICINE

(Leading to the Degrees of Bachelor of Science in Agriculture and Doctor of Veterinary Medicine)

FIRST YEAR

First Term	Hours per Week Th.	Pr.	Second Term	Hours per Week Th.	Pr.
Animal Husbandry 101 Market Types	4	4	Animal Husbandry 102 Market Types	0	4
Agronomy 105 Crop Production	3	2	Biology 102 Gen. Biology	2	4
Biology 101 Gen. Biology	2	4	Chemistry 102 Inorganic	3	3
Chemistry 101 Inorganic	3	3	English 104 Rhetoric and Composition	3	0
Dairy Husbandry 101 Judging Dairy Cattle	0	2	Mathematics 108 Agricultural	3	0
English 103 Rhetoric and Composition	3	0	Textile Engineering 102 Cotton Classing	0	2
Mil. Sci. 101, 103, or 105	1	2	Mil. Sci. 102, 104 or 105	1	2
	12	17		12	17

SECOND YEAR

Biology 207 Zoology	2	4	Agricultural Engineering 201 Farm Machinery	2	2
English 203 Adv. Composition	2	0	Biology 206 Bacteriology	1	4
Entomology 201 General	2	2	Chemistry 206 Organic	3	2
Geology 201 General	3	2	Dairy Husbandry 202 Dairying	2	2
Horticulture 201 Plant Prop. and Orcharding	2	2	English 204 Adv. Composition	2	0
Military Science 201 or 203	1	2	Military Science 202 or 204	1	2
Elective	3		Elective	3	
	15	12		14	12

THIRD YEAR

Animal Husbandry 303 Principles of Nutrition	3	2	Agronomy 307 Forage Crops	2	2
Genetics 301 Principles of Genetics	3	2	Economics ~~306~~ 103 Fundamental Principles	3	0
Veterinary Anatomy 111 Anatomy of the Domestic Animals	3	6	English ~~306~~ 303 Argumentation	2	0
Vet. Phys. and Pharm. 121 Physiology	2	0	Entomology 208 Animal Parasites	2	2
*Elective	6		Vet. Anatomy 112 Anatomy of the Domestic Animals	3	6
	11	16	Vet. Phys. and Pharm. 122 Physiology	2	0
			*Elective	4	
				18	10

*A minimum of twelve hours must be elected in Animal Husbandry during the course.

FOURTH YEAR

First Term	Hours per Week Th.	Pr.	Second Term	Hours per Week Th.	Pr.
English 401 Public Speaking	1	0	English 402 Public Speaking	1	0
Veterinary Anatomy 211 Anatomy of the Domestic Animals	3	6	Veterinary Pathology 242 General	3	2
Veterinary Anatomy 213 Histology and Embryology	2	4	Vet. Phys. and Pharm. 222 Physiology	3	4
Vet. Phys. and Pharm. 221 Physiology	2	0	Elective	11	
Elective	8			18	6
	16	10			

FIFTH YEAR

Vet. Med. and Surg. 371 Clinic	0	7	Vet. Med. and Surg. 372 Clinic	0	12
Vet. Medicine 351 Non-infectious Diseases	3	0	Vet. Medicine 352 Non-infectious Diseases	3	0
Vet. Pathology 341 Special	2	0	Vet. Pathology 342 Special	2	4
Vet. Pathology 343 Spec. Bacteriology	2	4	Vet. Pharm 334 Pharm.	3	0
Vet. Pharmacology 333 Pharmacology	3	4	Vet. Surgery 362 General	3	0
Vet. Surgery 361 General	3	0	Elective	5	
Elective	4			16	16
	17	15			

SIXTH YEAR

Vet. Medicine 453 Infectious Diseases	3	0	Vet. Medicine and Surg. 472 Clinics	0	7
Vet. Medicine and Surgery 471 Clinic	0	7	Vet. Medicine 452 Prac. of Med. and Jurisprudence	3	0
Vet. Medicine 451 Diseases of Small Animals and Fowls	3	0	Vet. Pathology 444 Laboratory Diagnosis	2	2
Vet. Pathology 441 Immunology and Serum Therapy	2	2	Vet. Pathology 442 Meat Hygiene	2	2
Vet. Pathology 443 Parasitology	2	2	~~Vet. Pathology 432~~ Toxicology	1	2
Vet. Surgery 461 Obstetrics	2	0	Vet. Surgery 462 Operative	3	4
Elective	7		Elective	4	
	19	11	Vet. Phy. and Ph. 432	15	17

THE SCHOOL OF VOCATIONAL TEACHING

XII.—COURSE IN AGRICULTURAL EDUCATION

FRESHMAN YEAR

First Term	Hours per Week Th.	Pr.	Second Term	Hours per Week Th.	Pr.
Agronomy 105 Crop Production	3	2	Animal Husbandry 102 Market Types	0	4
Animal Husbandry 101 Market Types	0	4	Biology 102 General Botany	2	4
Biology 101 General Botany	2	4	English 104 Rhetoric and Composition	3	0
Dairy Husbandry 101 Judging Dairy Cattle	0	2	Mathematics 108 Agricultural	3	0
English 103 Rhetoric and Composition	3	0	Military Science 102 or 104	1	2
Military Science 101 or 103	1	2	Poultry Husbandry 102 Farm Poultry	2	2
*Elective	3		*Elective	3	
	12	14		14	12

SOPHOMORE YEAR

Biology 207 Zoology	2	4	Chemistry 102 Inorganic	3	3
Chemistry 101 Inorganic	3	3	Dairy Husbandry 202 Dairying	2	2
English 231 English Literature	3	0	English 232 English Literature	3	0
Horticulture 201 Plant Prop. and Orcharding	2	2	Entomology 202 Economic Entomology	2	2
Military Science 201 or 203	1	2	Military Science 202 or 204	1	2
*Elective	3		*Elective	3	
	14	11		14	9

*To be chosen from the following:

Agricultural Economics 101 Agricultural Resources	3	0	Animal Husbandry 202 Breed Types	2	2
History 305 Citizenship	3	0	Horticulture 202 Vegetable Gardening	2	2
Rural Sociology 201 Human Relationships	3	0			

JUNIOR YEAR

Agricultural Education 305 Principles of Education	3	0	Agricultural Education 308 Educational Psychology	3	0
Agricultural Engineering 321 Farm Shop	1	4	Agricultural Engineering 322 Farm Shop	1	4
Agronomy 301 Soils	3	2	Chemistry 206 Organic	3	2
Genetics 301 Genetics	3	2	Economics 403 Fundamental Principles	3	0
Elective	6		Veterinary Anatomy 306 Animal Diseases	3	2
	16	8	Elective	4	
				17	8

SENIOR YEAR

First Term	Hours per Week Th.	Pr.
Agricultural Economics 411 — Agricultural Economics	2	2
Agricultural Education 401 — Principles of Teaching	3	2
Animal Husbandry 409 — Animal Nutrition and Feeding	3	2
English 401 — Public Speaking	1	0
Rural Sociology 407 — Rural Sociology	2	2
Elective	4	
	15	8

Second Term	Hours per Week Th.	Pr.
Agricultural Economics 421 — Farm Management	2	4
Agricultural Education 402 — Administration of Vocational Agriculture	3	2
Agricultural Education 404 — Extension Methods	3	0
Animal Husbandry 416 — Live Stock Management	3	2
English 402 — Public Speaking	1	0
Elective	4	
	16	8

XIII.—COURSE IN INDUSTRIAL EDUCATION

FRESHMAN YEAR

First Term	Hours per Week Th.	Pr.	Second Term	Hours per Week Th.	Pr.
Chemistry 101 Inorganic	3	3	Chemistry 102 Inorganic	3	3
Drawing 101 Mechanical	0	2	Drawing 108 Mechanical	0	2
English 103 Rhetoric and Composition	3	0	English 104 Rhetoric and Composition	3	0
Mathematics 101 Algebra	3	0	Industrial Education 102 Theory and Principles of Vocational Education	2	0
Military Science 101, 103 or 105	1	2	Mathematics 103 Trigonometry	3	0
*Elective	7		Military Science 102, 104 or 106	1	2
	17	7	*Elective	5	
				17	7

SOPHOMORE YEAR

Drawing 201 Mechanical	0	2	Drawing 202 Mechanical	0	2
Drawing 219 Freehand	0	2	Drawing 220 Freehand	0	2
Economics 203 Principles	3	0	Economics 204 Principles	3	0
Industrial Education 203 Trade Analysis	2	0	Industrial Education 202 Job Analysis	2	0
Military Science 201 or 203	1	2	Military Science 202 or 204	1	2
Physics 203 General	3	3	Physics 204 General	3	3
*Elective	6		Rural Sociology 202 Social Evolution	3	0
	15	9	*Elective	4	
				16	9

JUNIOR YEAR

History 305 Citizenship	3	0	Industrial Education 308 A Study of Modern Industries	3	0
Industrial Education 301 Methods and Management	2	0	Industrial Education 310 Course Making	2	0
Industrial Education 307 Psychology of Adolescence	3	0	Industrial Education 312 Psychology Applied to Industry	2	0
*Elective	12		Industrial Education 314 Observation and Criticism	1	2
	20	0	*Elective	11	
				19	2

SENIOR YEAR

Ind. Ed. 416 Prac. Teach. 0 - 6

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
English 401 Public Speaking	1	0	English 402 Public Speaking	1	0
Industrial Education 407 Special Methods of Teaching Industrial Subjects	2	0	Industrial Education 406 Vocational Guidance	2	0
Industrial Education 409 Organization and Management in Industrial Schools	2	0	~~**Industrial Education 412 Lesson Planning and Practice Teaching~~	~~1~~	~~4~~
~~*~~Industrial Education 411 Lesson Planning and Practice Teaching	~~2~~	~~0~~	Rural Education 422 History of Education	3	0
*Elective	~~12~~ 10		*Elective	11	
	~~18~~ 17	~~4~~ 6		~~18~~ 17	~~4~~ 6

IE 4.15 0-6

*For students with industrial experience approved by the head of the Department of Industrial Education and by the Dean of the School of Vocational Teaching, the total number of elective hours will be reduced by four term hours for each year of certified industrial experience, up to a maximum of 20 term hours.

**Approved teaching experience with written reports may be substituted for these courses on the basis of two term hours for each year of such experience, ~~up to a maximum of 20 term hours.~~

XVI.—COURSE IN RURAL EDUCATION

FRESHMAN YEAR

First Term	Hours per week Th.	Pr.	Second Term	Hours per week Th.	Pr.
Agronomy 105 Crop Production	3	2	Biology 102 General Botany	2	4
Biology 101 General Botany	2	4	English 104 Rhetoric and Composition	3	0
Dairy Husbandry 101 Judging Dairy Cattle	0	2	Mathematics 108 Agricultural	3	0
English 103 Rhetoric and Composition	3	0	Military Science 102 or 104	1	2
Military Science 101 or 103	1	2	Poultry Husbandry 102 Farm Poultry	2	2
Rural Education 121 Elementary School Methods	3	2	Rural Education 122 Elementary School Methods	3	2
	12	12		14	10

SOPHOMORE YEAR

Chemistry 101 Inorganic	3	3	Chemistry 102 Inorganic	3	3
English 231 English Literature	3	0	Dairy Husbandry 202 Dairying	2	2
Entomology 201 General	2	2	English 232 English Literature	3	0
Military Science 201 or 203	1	2	Military Science 202 or 204	1	2
Rural Education 221 Rural School Administration	3	0	Rural Education 222 Rural School Administration	3	0
Elective	3		Elective	3	
	15	7		15	7

JUNIOR YEAR

Biology 207 Zoology	2	4	Economics 403 Principles of Economics	3	0
English 303 Argumentation	2	0	English ~~303~~ 304 Argumentation	2	0
History 305 Citizenship	3	0	~~Rural Sociology 312 General Sociology~~	3	0 omit
Rural Education 321 Secondary School Methods and Management	3	2	Rural Education 322 Secondary School Methods and Management	3	2
Elective	6		Elective	~~X9~~ 1	
	16	6		17	2

SENIOR YEAR

English 403 Public Speaking	3	0	English 404 Public Speaking	3	0
Rural Education 421 History of Education	3	0	Rural Education 422 History of Education	3	0
Elective	12		Elective	12	
	18	0		18	0

COURSES OF INSTRUCTION BY DEPARTMENTS

The courses of instruction are described on the following pages under the departments in which they are offered. Courses from 101 to 199 are primarily for freshmen, 201 to 299 for sophomores, 301 to 399 for juniors, 401 to 499 for seniors, 501 to 599 for graduate students; courses 571 to 599 are offered by members of the Agricultural Experiment Station Staff; 1 to 49 for first-year students in short courses; 51 to 99 for second year students in short courses. First-term courses are as a rule given odd numbers, second-term courses, even numbers.

The figures in parenthesis following the name of a course indicate the number of hours per week, theory and practice, respectively, devoted to the course.

For convenience of reference, the departments are listed here in alphabetical order:

DEPARTMENT OF AGRICULTURAL ECONOMICS

Professor Buechel, Dr. Youngblood, Professors Lee, Leland, Associate Professors Youngman, Assistant Professor Purves, Mr. Weaver, Mr. Weinke, Mr. Hosking, Mr. Johnson, Mr. Mizell.

101. *Agricultural Resources.* (3-0).

A survey of the potentialities and limitations of agricultural production in relation to population pressure: physical bases of production as related to potentialities; effects of population pressure on land supply as manifested in the production of agricultural commodities throughout the world; trade in agricultural products in relation to surplus producing and deficit areas.

Text: To be selected.

(Required in XIV, XVIII; elective in I, XII).

102. *Agricultural Resources.* (3-0).

A survey of types of land utilization as developed in the various agricultural regions of the world; a study of typical cases such as China and India, the Mediterrean lands, Western Europe and the United States; the Agricultural Revolution as manifested in changes in the agriculture of the Old World and in the development of the great surplus producing regions in the interiors of the continents; development of surplus production in the tropics; present trends in centralization in world agriculture.

Text: To be selected.

Prerequisite: Agricultural Economics 101.

(Required in XIV).

201. *Principles of Accounting.* (2-4).

Development and application of the fundamental principles of accounting. Analysis and recording of transactions, columnar journals, controlling accounts, working sheets, merchandise accounts, trial balance and location of errors, financial statements, adjusting and closing entries.

Text: Complete Accounting Course, Unit I, Himmelblau.

Laboratory fee, $1.50.

(Required in XIV, XVIII; elective in VI).

202. *Principles of Accounting.* ~~(1-4)~~ (2-4)

A continuation of course 201. Application of the underlying principles to manufacturing business and corporate form of organization. Corporate organization, inventories of manufacturing establishments, voucher systems, cost elements, financial statements, factory ledger, bonds, stocks, surplus, reserves, dividends, funds.

Text: Complete Accounting Course, Unit II, Himmelblau.

Laboratory fee, $1.50.

(Required in XIV, XVIII; elective in VI).

303. *Theory and Practice of Accounting.* (2-4).

Further development of fundamental principles and application to specific subjects, such as: profit and loss determination, balance sheets, analysis of statements, depreciation, partnership accounting, goodwill, consolidations, amortization, and actuarial accounting.

Texts: Accounting Theory and Practice, Volume II, Kester; Problem text to be selected.

Prerequisite: Agricultural Economics 201, 202.

Laboratory fee, $1.50.

(Elective in XIV).

304. *Income Tax and Advanced Problems.* (1-4).

The federal income tax law and regulations, solutions of income tax problems, preparation of returns, solution of advanced accounting problems selected to further develop theory and give skill in problem solution. Advance problems include: insolvency, liquidation, receivership, branch house accounting, installment sales, consignments, foreign exchange, fidiciary accounts.

Texts: Tax Problems, Prentice Hall; Regulations 65; Accounting Problems, Advanced, Rittenhouse and Percy.

Prerequisite: Agricultural Economics 303.
Laboratory fee, $1.50.
(Elective in XIV).

305. *Statistical Method.* (2-4).

The meaning and application of statistical method. Recent figures relating to Texas agriculture are arranged in tables and diagrams and are used as a basis for practice exercises on averages, dispersion, index numbers, historical series, and for the determination of coefficients of correlation, variation, etc. Numerous exercises in the use of the correlation table are provided, especially for students majoring in genetics and kindred subjects. The primary aim of the course is to give training in the technique of the more common statistical manipulations so that the student may attack an actual problem with accuracy and confidence.

Text: Manual of Statistical Method, Jerome.
Laboratory fee, $1.50.
(Required in 1, group 12, XIV).

306. *Auditing.* (1-4)

Theory and practice of auditing, types of audits, audit procedure for individual assets and liabilities, working papers and reports, case studies, including audits of farm accounts and corporate organization.

Texts: Auditing, Bell and Powelson; Illustrative Audit 1, Kohler and Pettengill.

Prerequisite: Agricultural Economics 303.
Laboratory fee, $1.50.
(Elective in XIV).

312. *Agricultural Economics.* (2-2).

Among the topics considered are the following: Scope and aim of agricultural economics, analysis of the factors in agricultural production, such as the supply of arable land in the nation, its classification and order of utilization; the amount and character of labor required in different parts of the United States; migratory labor; possibilities of improving type and conditions of agricultural labor; marketing, agricultural finance, cooperation, transportation; distribution, including theories of rent, value of land and its relation to rent, methods of renting; consumption, its effect upon rent, wages, interest and national prosperity; agriculture and the State tariff, land settlement, taxation, and credit.

Text: To be selected.
Prerequisite: Economics 203, 204, Agricultural Economics 305.
(Required in XIV, I, group 12).

322. *Farm Cost Accounting.* (1-4).

Application to the farm enterprise of the bookkeeping principles and methods developed in course 201. The special records, and special accounts peculiar to farm costs, such as man labor, and horse labor records, field accounts and crop accounts; the distribution of farm income and expense to the various crop and livestock accounts; the preparation of detailed cost statements; the use of cost schedules for ascertaining, wherever possible, the profit or loss on individual farm operations; workable cost systems, their construction and analysis in relation to the farm policy and management.

Text: Farm Accounting, Curries, Lennes-Merrill.
Laboratory fee, $1.50.
Prerequisite: Agricultural Economics 201.
(Elective in XIV).

401. *Marketing.* (3-0). Given SS 1927 as MT 401.

A general course in marketing. Problems involved in the assembling of agricultural products and other raw materials and in the wholesaling and retailing of manufactured products, market financing, market risk-taking, and price determination.

Text: Principles of Marketing, F. E. Clark.
Prerequisite: Agricultural Economics 312 or 411.
(Required in XIV).

402. *Property and Contract.* (3-0).

Problems of property and the social theory of property; conscious social action with reference to property and the evolution of property; the several classes of property; property and economic theory; property and the individual; property and the future; property and contract.

Text: Property and Contract, Ely.
Prerequisite: Agricultural Economics 312.
(Required in XIV).

410. *Transportation.* (3-0).

The factors affecting the transportation of agricultural products; the American railway system and its development; the various services performed by the railways; the economics of the railway enterprises; the regulation of railways; plans for the solution of the railway problem and rate situation as it relates to agriculture.

Text: Principles of Railway Transportation, Jones.
Prerequisite: Economics 203, 204.
(Elective in XIV).

411. *Agricultural Economics.* (2-2).

Similar to course 312 except that the laboratory exercises are qualitative rather than quantitative in character, since statistical method is not a prerequisite for this course. Open to students in technical agriculture.

Text: Agricultural Economics, Taylor.
Laboratory fee, $1.50.
(Required in I, XII).

412. *Public Finance and Taxation.* (3-0).

The purpose of the course is to give a working knowledge of public financial institutions and practices. A model system of taxation is discussed; and taxes particularly affecting the agriculturalist are studied in detail. Among the topics considered are: the amount and growth of public expenditures; the sources of revenue; budgetary methods; principles which should govern appropriations; public industries and price making; the principles of taxation; the important kinds of taxes; the principles of borrowing; the management of public debts.

Text: Introduction to Public Finance, Plehn.
Prerequisite: Economics 203, 204, Agricultural Economics 312.
(Elective in XIV).

413. *Cooperative Marketing of Farm Products.* (3-0).

An intensive study of farmer cooperative selling organizations. A careful analysis of the organization method and underlying philosophy of the two prevailing types of cooperative enterprises, viz., the centralized type and the local federated type.

Text: To be selected.

Prerequisite: Economics 203, 204, or 305; Agricultural Economics 312, or 411; Agricultural Economics 401.

(Elective in XIV).

414. *Cooperative Accounting.* (1-2).

A study of the special features of accounting for various types of cooperatives; an analysis of the accounting systems devised and recommended by government agencies and farmer organizations. Each student is expected to devise a system for some cooperative organization in which he is interested.

Text: To be selected.

Prerequisite: Agricultural Economics 303.

Laboratory fee, $1.50.

(Elective in XIV).

416. *Advanced Statistics.* (2-4).

A brief review of the theory and relationship of different methods of determining averages and dispersion; advanced study of index numbers and analysis of the index numbers used in the U. S. and Europe; preparation of an index number of amount of physical production and prices of main agricultural products of Texas. A thorough study of the methods of analyzing time series and of forecasting business activities. Special attention is given to the use of correlation in handling agricultural problems; especially by the use of partial and multiple correlation and methods of handling curvilinear relationships.

Text: Yule, Introduction to the Theory of Statistics.

Prerequisite: Agricultural Economics 305, Mathematics 301, 302.

Laboratory fee $1.50.

(Elective in XIV).

417. *Cost Accounting.* (1-4).

Development of cost accounting principles, cost elements, methods of control, order and process systems, estimated and standard costs, debatable points of theory, cost accounting for agricultural enterprises.

Text: Cost Accounting. Jordan and Harris.

Prerequisite: Agricultural Economics 303.

Laboratory fee, $1.50.

(Elective in XIV).

418. Ranch Economics. (3-0).

Introductory: Area and extent of grazing lands in the United States and in Texas; a historical sketch of ranching; the position of ranching in our national economy; ranch economics defined; the relation of ranch economics to the other sciences. Production on ranches; ranch land as a factor of production; the carrying capacity of the ranges; diversified ranching; range conservation. Labor as a factor of production in ranching; the management of labor. Ranch capital as a factor of production; ranch finance; ranch credits, means of ac-

quiring a ranch; permanent improvements; operating capital; land credits; live stock credits; intermediate-time credits; short-time operating and marketing credits; the size of ranches. The ranch entrepreneur as a factor of production. Exchange in ranch economy; the marketing of ranch products from the standpoint of production; the application of the value concept in ranch economy; factors affecting the supply of ranch products; factors affecting the demand for ranch products; the cost of production as related to value in ranching; the marketing of ranch products from the standpoint of exchange; transportation problems in the ranch country; the movements of livestock in seeking markets; ranchmen's organizations. Distribution of ranch income; the interest on capital; the rent of land; the wages of labor; the profits of the entreprenuer; factors influencing distribution. Consumption; an analysis of human wants; standards of living; ways and means of increasing the consumption of ranch products.

Lectures.

Prerequisite: Economics 203, 204 or 305; Agricultural Economics 312 or 411; Animal Husbandry 409.

~~Laboratory fee, $1.50.~~

(Elective in XIV).

419. *Agricultural Finance.* (3-0).

A study of the relation of credit to the growing and marketing operations in agriculture, emphasizing the principles underlying the operations of such farm credit institutions as farm mortgage banks, federal intermediate credit banks, Federal land banks, national and state banks and trust companies. The fundamental principles of credit as applied to agriculture; the proper use of credit institutions.

Texts: Farm Mortgage Financing, Wright; Bank Credit and Agriculture, Wright.

Prerequisite: Agricultural Economics 312 or 411.

(Elective in XIV).

421. *Farm Management.* (2-4).

The application of business principles to the farm business: selecting a farm; choosing crop and livestock enterprises; use of funds; determining capital needs; organizing the business; planning operations; using the proper amounts and kinds of land, labor, and capital; the relation of the farmer to the Extension Service and Experiment Station of the Agricultural College.

Text: Holmes, The Economics of Farm Organization and Management.

Prerequisite: Agricultural Economics 312.

Laboratory fee, $1.50.

(Required in I, groups 2, 3, 4, 5, 7, 12; XII, XIV).

424. *Business Analysis.* (1-6).

Applications of the subject matter of course 421. Successful and unsuccessful farms are visited, their present organization and administration are studied thoroughly to bring out the desirable and undesirable features; their degree of success or failure is correlated with the extent to which sound farm management principles are followed; and careful plans that will rectify existing weaknesses are prepared. Advanced studies of certain farm management prin-

ciples are made during the course in connection with their application to the farms visited. One or two trips of two or three days are made to important farming regions at some little distance from the College.

Prerequisite: Agricultural Economics 421.
Laboratory fee, $1.50.
(Elective)

FOR GRADUATES.

501, 502. *Advanced Marketing Problems.* (2-4).

Field work. An intensive study of some marketing problem. The marketing of non-perishables, semi-perishables and perishable agricultural commodities. A paper based upon original research is required.

(Seminar).

Text: To be selected.

Prerequisite: Agricultural Economics 312, 401.

503. *Land Problems and Land Policies.* (2-4).

Definitions of terms and historical setting; land defined and described; land classifiication; economics of agricultural land; economics of forest land; economics of mineral land; economics of water rights; economics of riparian rights; economics of urban land; economics of land for highways; economic foundations of a land policy; land policies of some of the leading European countries; land policy of the United States; Texas land policy; a sound land policy for Texas.

(Seminar).

Text: To be selected.

Prerequisite: Agricultural Economics 312.

505. *Historical Development of Agricultural Economics.* (2-4).

Agricultural economics defined and described; origin of agricultural economics; historical developments of agricultural economics in Rome, England, Germany, and France. This part of the historical work deals very largely with the biographical sketches of the writers concerned and with the history of economic conditions at the time they wrote, especially as related to agriculture, relation of agricultural economics to general economics; the early French economists, the classical economists, the critics of the classical economicists; relation of agricultural economics to agriculture; the works of such men as Arthur Young, Albrecht Thaer, and Von Thunen; modern agricultural economics; relation of general economics to agriculture; recent developments in agricultural economics; relation of agricultural economics to farmer's movements; essentials of a sound agricultural economics course.

(Seminar).

Text:

Prerequisite: Agricultural Economics 312.

506. *Advanced Statistics.* (2-4).

A study of the various series of index numbers in both the United States and Europe; preparation of an index series based upon the main items sold from the farm and another based upon the main items bought for the farm and farm family; determination of the secular trend by the methods of least squares and by the use of the moving average. Some attention will be given to advanced

problems in correlation, including partial or multiple correlation.
(Seminar).
Text: To be selected.
Prerequisite: Agricultural Economics 305, 312; Mathematics 301, 302.

507. *Statement Analysis.* (2-4).
An analytical study of the different kinds of statements for the guidance of executives, investors and creditors. Considerable time is given to the study of balance sheet and profit and loss ratios.
Texts: Assigned Readings: McKinney and Meech, Controlling the Finances of a Business; Bliss, Financial and Operating Ratios in Management; Bell, Accountants Reports; Greendlinger, Analysis of Financial Statements.
Prerequisite: Agricultural Economics 303, 313, 417.
Laboratory fee, $1.50.

509, 510. *Agricultural Distribution.* (2-4).
A study of the apportionment of the agricultural income among the factors of production. Historical development of the theory of rent, interest, wages and profits. Relation of rent to land value in theory and in practice.
(Seminar).
Text: To be selected.
Prerequisite: Agricultural Economics 312.

512. *Economics of Cotton Marketing.* ~~(3-0)~~. 2-4
Machinery used and functions performed in the marketing of cotton. Price determination—agencies for obtaining demand and supply information; analysis and interpretation of this information.
Text: To be selected.
Prerequisite: Agricultural Economics 401.
Open to undergraduates who have made a grade of B or A in course 401.

571, 572. *Agricultural Experiment Station Methods of Research.* (2-4).
This course begins with a review of the beginnings and progress of agricultural experimentation and research, with as many examples as may be necessary for illustrative purposes. The greater part of the course, however, will involve a study of the proper adaption of the scientific method to the work of given specialists. Dr. Youngblood.

573, 574. *Research in Ranch Economics.* (2-4).
This course is designed mainly for graduate students who not only wish to do advanced work in ranch economics, but also desire to do research in this field. It deals with the history of ranching as an industry, the problems of production on ranches, ranch lands, the carrying capacity of the ranges, ranch labor, ranch capital, ranch management and risk-taking, proportioning the factors of production on the ranches, the question of the size of ranches, ranch tenure, the marketing of ranch products, the distribution of ranch income, the question of consumption from the ranchman's viewpoint, and ranch social life and institutions. Dr. Youngblood.

DEPARTMENT OF AGRICULTURAL EDUCATION

Professor Winkler, Professors McIntosh, Buck, Associate Professor Alexander.

207. *Psychology.* (3-0).

An introductory course dealing with the elementary principles of Psychology. (Required in VI, XVIII, XX; elective in X).

305. *Priniciples of Education.* (3-0).

An introductory course to the field of general education, designed to acquaint the student with the principles of educational theory; the aim and meaning of education, emphasizing the vocational viewpoint.

(Required in I, group 2; XII).

308. *Educational Psychology.* (3-0).

A course in Psychology with special emphasis on its application to the problems of teaching.

(Required in I, group 2; XII; elective in X).

401, 402. *Teaching Vocational Agriculture.* (3-2).

Analysis of the Agricultural teacher's job; courses of study; annual plan; lesson plans; project outlines and supervision; equipment; reports; observation and directed teaching.

(Required in I, group 2; XII).

404. *Extension Methods.* (3-0).

The agricultural extension movement;organization of extension work; State and county plan of work; the county agent and extension specialists; the Farm Bureau; other extension agencies.

(Required in XII; elective in I).

423. *Educational Tests and Measurements.* (3-0).

The teacher of agriculture is constantly being used in the smaller school systems of the State as principal or superintendent. It is, therefore, important that he become acquainted with modern methods of measuring the results of teaching. A study is made of the various tests and measurements employed in measuring school-room instruction.

(Elective).

FOR GRADUATES

501, 502. *Agricultural Education.* (4-0).

This course involves more extensive study of the problems considered in 401 and 402. Each student selects a special problem for intensive study as a basis for his thesis. Courses 401 and 402 must precede or accompany this study.

503,504. *Agricultural Extension Methods.* (4-0).

This course involves extensive study of the problems considered in course 404. In addition to this study of the entire field of Farmers' Co-operative Extension Work in Agriculture and Home Economics each student selects an individual problem for intensive study as a basis for his thesis. Course 404 must precede or accompany this study.

505, 506. *Administration and Supervision of Vocational Agriculture.* (4-0).

A course designed for teachers of Vocational Agriculture preparing for State Supervisory positions. It includes a study of the duties of the state supervisor, his relation to teachers of vocational agriculture, teacher training institutions, Federal Boards for Vocational Education, and other agencies engaged in Agricultural Education.

DEPARTMENT OF AGRICULTURAL ENGINEERING

Professor Scoates, Associate Professors H. P. Smith, Raney, Assistant Professor F. R. Jones, Mr. De Forest

101, 102. *Farm Shop.* (0-3).

A modification of course 321, 322.

Laboratory fee, ~~$1.50~~ $1.25

(Required in XV).

201. *Farm Machinery.* (2-2).

Construction, adjustment, operation and repair of all types of farm machinery; tilling, seeding, cultivating, fertilizing and power machinery.

Laboratory fee, 50 cents.

(Required in I, XV, XXI, C).

203. *Gas Engines.* (2-2).

Construction, operation, care and repair of farm gas engines.

Laboratory fee, $1.00.

(Required in XV; elective in C and I).

214. *Tractors.* (2-4).

Construction, operation, care and repair of farm gas tractors.

Prerequisite: Agricultural Engineering 203.

Laboratory fee, $2.00.

(Required in I, group 3, XV; elective in C).

305. *Surveying and Drainage.* (3-4).

Surveying with its farm application; principles of farm drainage as applied to open ditches, terraces, tile drains; promotion of drainage districts; use of dynamite, removal of stumps; law with respect to farm waters.

Laboratory fee, 50 cents.

(Required in I, groups 3, 10; XX; elective in C).

321, 322. *Farm Shop.* (1-4).

A course for vocational school teachers which includes: soldering, belt lacing, rope knots and splices, concrete construction, carpentry, sufficient forging to enable the student to make ordinary farm repairs.

Laboratory fee, $1.50.

(Required in XII; elective in C).

402. *Automobiles and Trucks.* (2-4).

Construction, operation, care and repair of the gasoline automobile and truck.

Prerequisite: Agricultural Engineering 203.
Laboratory fee, $1.50.
(Required in I, group 3; XV; elective in C).

409. *Farm Concrete.* (1-2).
Selection of materials used in concrete; proper mixing, placing and curing; construction of forms; special emphasis laid on application of concrete for farm use.
Laboratory fee, $1.50.
(Elective in C).

410. *Irrigation.* (2-4).
Principles of irrigation practice; source of water supply; methods of obtaining water; distribution systems; application of water to crops; measurement and duty of water; control of alkali.
(Required in XV; elective in C).

413. *Farm Buildings.* (2-3).
Design and location of farm buildings; building materials; construction; arrangement; ventilation, heating, lighting, water supply and sewage disposal.
(Required in I, group 3; XV).

416. *Drainage.* (2-4).
Principles of farm drainage as applied to open ditches, terraces, tile drains; promotion of drainage districts; use of dynamite; removal of stumps; law with respect to farm waters.
Laboratory fee, 50 cents.
(Required in XV).

418. *Designing of Farm Structures.* (2-4).
A Continuation of course 413.
(Required in XV).

421. *Advanced Farm Shop.* (2-4).
Advanced study of Farm Shop with special emphasis laid on problems relative to teaching the course, i. e. equipment, methods, supplies and projects.
Prerequisite: Agricultural Engineering 321, 322.
Laboratory fee, $1.50.

419 — Cotton machine ½ — (2-2)

FOR GRADUATES.

501, 502. *Advanced Drainage and Irrigation.* (2-4).
Advanced study of Farm drainage and irrigation with special emphasis on recent developments.
Prerequisite: Agricultural Engineering 305 or 416 and 410.

503, 504. *Advanced Farm Machinery.* (2-4).
Advanced study of farm machinery with special emphasis on recent developments.
Prerequisite: Agricultural Engineering 320.

505, 506. *Advanced Farm Buildings.* (2-4).
Advanced study of farm buildings and farm home utilities.
Prerequisite: Agricultural Engineering 413.

507. *Cotton Machinery.* (1-2).

An advanced course in cotton machinery used for preparation of seed bed, seeding, cultivating, harvesting and ginning— with special emphasis on recent developments.

DEPARTMENT OF AGRONOMY

Professor J. Oscar Morgan, Professor Stallings, Associate Professors Pollock, Mogford, Mr. Sturgis.

105. *The Fundamentals of Crop Production.* (3-2).

Classification and distribution of farm crops; value of good varieties and good seed; crop improvement; preparation of the seed bed; commercial fertilizers, manures and lime; seeding practices; crop tillage; harvesting; meadow and pasture management; weeds; crop rotation; diseases and insect enemies.

Text: The Production of Field Crops, Hutcheson and Wolfe.

(Required in I, XII, XIV, XV, XVI, XX, XXI).

201. *Elementary Cotton Production.* (3-0).

An elementary study of the varieties, breeding, tillage practices, harvesting, insect enemies and diseases of cotton.

(Open to students in Course XVIII only).

(Required in XVIII).

301. *Soils.* (3-2).

Soil forming processes; geological classification of soils; organic matter; colloidal matter; soil structure and its modification; form of soil water; soil water in its relation to plants; control of soil water; soil heat; soil air; absorbitive properties of soils; removal of nutrients by cropping and leching; alakli soils; soil acidity; soil organisms; principles of fertilizer practice; farm manures; green manures; maintenance of soil fertility.

Text: The Nature and Properties of Soils, Lyon and Buckman.

Prerequisite: Chemistry 101, 102.

Laboratory fee, 50 cents.

(Required in I, all groups except 12; XII, XV, XX).

307. *Forage Crops.* (2-2).

The production, harvesting and preservation of alfalfa, cowpeas, soy beans, vetches, sudan grass, sorghums, bermuda grass, Johnson grass, Lespedeza and the other miscellaneous hay and pasture crops adapted to southern agriculture; problems of meadow and pasture management.

Text: Forage Crops, Piper.

Laboratory fee, 50 cents.

(Required in I, group 4, XXI).

314. *Field Crops.* (3-2).

The production, harvesting and utilization of corn, oats, wheat, barley, rye, rice, the grain sorghums and sugar cane.

Text: Field Crops for the Cotton-belt, Morgan.

Laboratory fee, 50 cents.

(Required in I, group 4).

316. *Fiber Crops.* (2-2).

Cotton production, including species, varieties, improvement, adaptation, fertilization, tillage practices, harvesting, insects and diseases; flax, hemp, and other miscellaneous fiber crops are treated briefly.

(Elective).

405. *Grain and Hay Grading.* (0-6).

Detailed instruction in the matter of grading grains and hays according to the Federal standards.

The work in grain grading includes a study of dockage, weight moisture, heat damage, foreign material and other factors influencing the commercial grade of corn, oats, wheat, and the grain sorghums.

The work in hay grading includes a study of the grade factors influencing the market value of hay; the kinds of inspections made on markets in the United States; practice in grading baled hay according to the United States grades; certificate writing.

Laboratory fee, $2.00.

(Elective).

406. *Soil Mapping.* (0-3).

Methods of classifying soils; benefits from soil surveys; a field study of the various soil types found in the surrounding locality, their area being surveyed and mapped according to the methods employed by the Bureau of Soils of the United States Department of Agriculture.

Prerequisite: Agronomy 301.

(Elective).

411. *Soil Fertility.* (2-2).

A detailed study of the factors effecting the immediate producing capacity of the soil.

Prerequisite: Agronomy. 301.

Laboratory fee, $1.00.

(Required in I, group 4).

414. *Soil and Crop Problems.* (3-0).

Special problems dealing with the management and utilization of distinctive types of soils and soil conditions and a detailed consideration of crop management problems under varying soil and climatic conditions.

(Elective).

415, 416. *Soil and Crops Seminar.* (1-0).

A review and presentation of the results of especially selected lines of research, dealing with soils and crops.

(Required in I, group 4).

417. *Range and Pasture Improvement and Maintenance.* (2-0).

Problems dealing with the revegetation, improvement and maintenance of ranges and pastures. Weeds and poisonous plants and their eradication will receive special attention.

(Elective).

420 - Cotton Research Methods (1-0)
422 — (0-3)

FOR GRADUATES

501, 502. *Advanced Farm Crops.* (2-4).

An advanced study of field crop production and breeding, including a thorough review of the more recent and noteworthy investigations in this field.

505, 506. *Advanced Soils.* (2-4).

A concise review of our present knowledge of the soil as a medium for plant growth, followed by a detailed study of the more recent and noteworthy investigations pertaining to soils and soil fertility.

507, 508. *Advanced Cotton Production.* (2-4).

An advanced study of cotton from the standpoint of species, varieties, breeding, fertilization, tillage practices, and harvesting. In the course extended use is made of the recent cotton literature in scientific journals, experiment station bulletins, and such reference books on cotton as are available.

571, 572. *Research in Cotton Breeding.*

This is a thesis course only and is designed for students who are majoring in Genetics or Agronomy and who desire to become familiar with the methods of commercial cotton breeding. The problem given to the student will cover in its completion, in relation to cotton breeding, the biometerical methods; progeny analysis; germination, seedling and maturity test procedure; stapling; ginning; etc.. Students electing this course must first be familiar with the fundamentals of Genetics and Agronomy. Mr. Killough.

FOR STUDENTS IN SHORT COURSES:

25. *Soils.* (3-2).

Soil fertility and its maintenance; manures; fertilizers; cover crops; fallowing; fall and spring plowing; crop rotations.

Text: Productive Soils, Weir.

Laboratory fee, 50 cents.

(Required in C).

30. *Elementary Crop Production.* (3-2).

An elementary study of the leading field and forage crops adapted to southern agriculture.

Text: Productive Farm Crops, Montgomery.

Laboratory fee, 50 cents.

(Required in C).

DEPARTMENT OF ANIMAL HUSBANDRY

Professor D. W. Williams, Professor R. H. Williams, Associate Professors Buchanan, Regenbrecht, Assistant Professors Groth, Mackey.

101. *Judging Market Types of Beef Cattle and Sheep.* (0-4).

Cattle and sheep terms; description and value of beef and mutton types; beef and mutton carcasses; wholesale and retail cuts; factors determining dressing percentage; packing house by-products; score card and comparative judging;

feeder steers and feeder lambs; market classes and grades of cattle and sheep; dual purpose cattle; fine wool sheep; classification of breeds.

Text: Types and Market Classes of Live Stock, Vaughan.

(Required in I, XI, XII, XV, XX, XXI).

102. *Judging Market Types of Horses and Swine.* (0-4).

Origin of the horse; anatomical review; conformation with relation to action; classification of breeds; draft type; carriage type; roadster type; saddle type; hunter type; Polo pony; mules; market classification; unsoundnesses; lard type hogs; bacon type; the hog carcass; wholesale cuts; by-products; market classification; breed classification; score card and comparative judging.

Text: Types and Market Classes of Live Stock, Vaughan.

(Required in I, XI, XII; in XV for the class of 1927; XX, XXI).

202. *The Breeds of Farm Animals.* (2-2).

The origin and native homes of breeds of horses, cattle, sheep, and swine; early development; constructive breeders; adaptibility; distribution; breed type and characteristics; breed organizations; publications; score card and comparative judging of representative animals.

Text: Types and Breeds of Farm Animals, Plumb.

Prerequisite: Animal Husbandry 101, 102.

(Elective in I, XII, C).

303. *Animal Nutrition.* (3-2).

Chemical composition of feeding stuffs; composition of farm animals; digestion; metabolism; functions of nutrients; vitamins; coeffificients of digestibility; energy in feeds and its uses; feed requirements of animals; maintenance, growth; fattening; milk production; wool production; work; computation of rations; manurial value of feeds; nature and uses of feed stuffs including cereal grains, cereal by-products, legumes and legume seeds, oil bearing seeds and by-products, packing house by-products; hays, fodders; straws; pastures, forages, silage, and miscellaneous feeds.

Prerequisite: Chemistry 206.

(Required in I, group 7, XXI).

403. *Advanced Judging.* (0-6).

An advanced course in live stock judging.

Prerequisite: Animal Husbandry 101, 102, 203.

(Elective).

406. *Beef Cattle Production.* (3-2).

The world beef cattle situation; factors governing beef production; adaptation of breeds; the breeding herd; pure bred herds; range cattle; feeders; growing the calf; fattening steers; baby beef; wintering; kinds and care of pastures; feeding cattle for show; marking and branding; marketing; business phases of cattle feeding; common ailments; records.

Prerequisite: Animal Husbandry 303, Genetics 301.

(Elective).

409. *Animal Nutrition and Live Stock Feeding.* (3-2).

A modification of course 303 together with a study of the practical feeding of horses, dairy cattle, beef cattle, sheep and swine.

Text: Feeds and Feeding, Henry and Morrison.
Prerequisite: Chemistry 206.
(Required in I, group 4; XI, XII).

410. *Sheep and Wool Production.* (3-2).
Historical sketch; problems and methods of improvement; establishing the flock; handling the breeding flock; pastures and forages; developing lambs; range management; fitting and showing; parasites and diseases; wool production and grading; feeder lamb production; marketing wool and mutton.
Prerequisite: Animal Husbandry 303, Genetics 301.
(Elective).

412. *Swine Production.* (3-2).
Review of hog situation; adaptation of breeds; breeding; feeding; forage crops; housing; fencing; equipment; fitting for show; showing; sanitation and disease control; marketing; killing and curing products; keeping records.
Prerequisite: Animal Husbandry 303, Genetics 301.
(Elective).

413. *Horse Production.* (3-2).
Review of the horse and mule situation; breeding; feeding; management; sales agencies; training; harness; fitting for sale and show; shoeing; shipping; sanitation; stallion registration laws.
Prerequisite: Animal Husbandry 303, Genetics 301.
(Elective).

416. *Live Stock Management.* (3-2).
A modification of courses 406, 410, 412, 413.
Prerequisite: Animal Husbandry101, 102 and 409.
(Required in XII).

418. *Wool and Mohair.* (2-4).
Microscopic structure; chemical composition; production; preparation for market; market reports; marketing comparison with other textile materials; measurement; grading; sorting; scouring; pullaries; processes of manufacture of fabrics.
(Elective).

421. *Advanced Studies of Breeds of Live Stock.* (2-0).
Methods used in the development of outstanding animals; popular lines of breeding; breed improvement; characteristics and breeding of show winners. The following breeds will be considered; Hereford cattle, Percheron horses, Rambouillet and Delaine sheep, Duroc-Jersey hogs. Taught by Division heads. Open to advanced under-graduate and graduate students.
Prerequisite: Animal Husbandry 101, 102, 202.
(Elective).

422. *Advanced Studies of Breeds of Live Stock.* (2-0).
Same as course 421 except that the following breeds will be considered: Aberdeen-Angus and Shorthorn cattle, Belgian horses, Hampshire and Shropshire sheep, Poland-China hogs.
Prerequisite: Animal Husbandry 101, 102, 202.
(Elective).

307. *Farm Meats.* (0-4).

Farm meat supply; methods of slaughtering, dressing, cutting, and curing meats; utilization of by-products; factors influencing value of meat and dressing percentage of animals.

Text: Farm Meats, Helser.

(Elective).

423. *Seminar.* (2-0).

Research methods in animal experimentation; sources of error in experimental work; review of research literature with oral and written presentation. Open to advanced under-graduate and graduate students.

Prerequisite: Animal Husbandry 303,Genetics 301.

(Elective).

424 (3-0)

FOR GRADUATES

501, 502. *Advanced Animal Nutrition.* (2-4).

A continuation of material covered in course 303; review of more recent investigations; methods of investigation; sources of error.

505, 506. *Advanced Live Stock Production.* (3-2).

A continuation of courses 406, 410, 412, and 413. The course will be varied according to the class of live stock in which the student is most interested. Managerial problems of production will be considered in detail.

571, 572. *Wool and Mohair Research.* (3-4).

Offered only by individual agreement, to graduate students qualified by previous training to do thesis work on some portion of an organized wool or mohair research project.

Studies under way include a determination of the grades and shrinkages of wool and mohair from registered and unregistered flocks. The wool and mohair grading and scouring laboratory is at disposal of graduate students taking this course. Mr. Jones.

573, 574. *Research in Animal Breeding.*

This course is a thesis course only and is designed to furnish to students majoring in genetics, animal husbandry, or dairy husbandry, the opportunity to work out a thesis upon some breeding problem which is of sufficient practical importance to be organized as a regular research project of the Experiment Station. Portions of projects already organized are available as thesis subjects and include problems of inheritance in beef cattle, dairy cattle, sheep and goats. Most of the problems available involve principles both of genetics and either animal husbandry or dairy husbandry, and students electing this course must first be familiar with the fundamentals of those fields. Dr. Lush.

23. *Judging Market Types of Beef Cattle and Sheep.* (0-4).

A modification of course 101.

Text: Types and Market Classes of Live Stock, Vaughan.

(Required in C).

24. *Judging Market Types of Horses and Swine.* (0-4).
A Modification of course 102.
Text: Types and Market Classes of Live Stock, Vaughan.
(Required in C).

52. *The Breeding of Live Stock and the Study of Pedigrees.* (2-2).
Principles of breeding; methods used in the practice of breeding pure-bred and market horses, cattle, sheep and swine; pedigree study.
Text: The Breeding of Animals, Mumford.
(Elective in C).

55. *Live Stock Feeding.* (2-2).
A modification of course 409.
(Elective in C).

58. *Live Stock Management.* (2-2).
A modification of course 416.
Prerequisite: Animal Husbandry 55.
(Elective in C).

DEPARTMENT OF ARCHITECTURE

Professor June, Professors Geist, Langford, Associate Professor Lindsey, Mr. Finney.

101, 102. *Architectural Drawing.* (0-4).
Lettering, line drawing, pattern, moldings, band ornament proportion of openings, geometrical constructions, curves and spirals, coordinated projections, elementry stereotemy, india ink and color washes, elements of architecture, application of cast shadows, the orders, architectural composition.
Text: First term, Architectural Drawing Manual, June.
Second Term, Proportional Method for Drawing the Orders, June.
(Required in IX; 101 required in I, group 10; XX).

104. *Shades and Shadows.* (2-0).
Review of underlying principles of descriptive geometry; plotting of shades and shadows; first on simple geometrical forms, leading to their application to more difficult architectural elements.
Text: Architectural Shades and Shadows, McGoodwin.
Prerequisite: Drawing 103a.
(Required in I, group 10; IX, XX).

109, 110. *Freehand Drawing.* (0-3).
Sketching from geometrical solids, simple objects, plaster casts, still life, elementary color and color wheels.
Adaptation of light and shade in drawing.
(Required in I, group 10; IX, XX).

201, 202. *Design (Elementary).* (0-10, 0-14):
Simple problems in design and composition, presentation, rendering, application of elements of Architecture, analtique, research.

Prerequisite: Architecture 102.
(Required in IX, group 1).

201a, 202a. *Design. (Elementary).* (0-8, 0-4).
Similar to course 201, 202.
Prerequisite: Architecture 102a.
(Required in IX, group 2).

203. *Principles of Perspective.* (1-0).
A study of the principles of perspective drawing; their application to various architectural subjects.
Lectures; recitations; problems.
Text: Perspective, Lubschez.
Prerequisite: Drawing 103a.
(Required in IX, groups 1, 2).

205, 206. *Freehand Drawing.* (0-4).
Sketches in charcoal of the full length antique and other subjects; shaded charcoal drawing from the full length figure and from casts of architectural ornament, water color studies.
Prerequisite: Architecture 110.
(Required in I, group 10; IX, group 1 both terms; group 2 first term;XX).

207, 208. *History of Architecture.* (2-0).
Egyptian, Western Asiatic, Greek, Roman, Early Christian, Byzantine, Romanesque, and Gothic styles.
Written quizzes; tracings; lectures.
Text: Outlines of History of Architecture, Newcomb, Part 1, first term, Part II, second term.
(Required in IX, groups 1, 2).

211. *Color Harmony and Design.* (0-3).
Exercises in the harmony of color; the use of water and distemper colors for the purpose of training the student in the use of color combinations. Decorative and pure design.

217, 218. *Mechanics of Materials.* (3-0).
Space, force, stress, moment, and shear diagrams.
Properties of materials and theory of design.
Text: Techanical Mechanics, Maurer.
Prerequisite: Mathematics 101, 102, 103, 104.
(Required in IX, group 1).

300. *Working drawings. Summer following Sophomore year, three weeks.*
Work in laying out details of building construction such as cornices, window and door frames, stairs, fireplaces, and similar construction for timber and masonry buildings.
Prerequisite: Architecture 202 or 202a.

(Required in IX, groups 1, 2).

301, 302. *Design (Intermediate).* (0-15).
Major and sketch design problems of small ensemble involving composi-

tion, planning and presentation. Archaeological problems, library research.
Prerequisite: Architecture 202.
(Required in IX, group 1).

305, 306. *Freehand Drawing.* (0-4).
Pen and ink, pencil and water color drawing.
Prerequisite: Architecture 206.
(Required in IX, groups 1, 2).

309. *History of Architecture.* (2-0).
Renaissance and modern architectural styles.
Written quizzes; tracings; research lectures.
Text: Outlines of History of Architecture, Newcomb, Part III.
(Required in IX, groups 1, 2).

311, 312. *Design (Intermediate).* (0-12).
Similar to course 301, 302.
Prerequisite: Architecture 202a.
(Required in IX, group 2).

316. *Mechanical Equipment of Buildings.* (3-0).
Heating and ventilation; water supply; plumbing and sanitation; electric wiring.
Text: Mechanics of the Household, Keene.
Prerequisite: Mathematics 101, 102, 103, 104; Physics 203, 204.
(Required in IX, groups 1,2).

317. *Framed Construction.* (2-3).
Design of wood and steel framing as used in building construction; beams; columns; struts; roof trusses; analytic and graphic methods.
Text: Handbook of Building Construction, Hool and Johnson.
Prerequisite: Architecture 217, 218.
(Required in IX, group 1).

318. *Reinforced Concrete.* (3-3).
Theory of reinforced concrete; design of walls; columns, beams, and slabs.
Text: Reinforced Concrete Construction, Hool.
Prerequisite: Architecture 217, 218.
(Required in IX, group 1).

400. *Working Drawings. Summer following Junior year, three weeks.*
Work in laying out and tracing general working drawings for buildings.
Prerequisite: Architecture 300.
(Required in IX, groups 1,2).

401, 402. *Design (Advanced).* (0-18,0-20).
Major and sketch design problems of large ensemble involving composition, planning and presentation. Archaeological problems, library research.
(Required in IX, group 1).

406. *Professional Practice.* (2-0).
A series of lectures on the law of contracts; professional practice; ethics; professional and inter-professional relationships.

Text: Handbook of Architectural Practice, A. I. A.
(Required in IX, groups 1, 2).

407. *History of Art.* (2-0).

Analysis of architectural ornament.
History of painting, sculpture and ornament.
Art appreciation. Lectures and research.
(Required in IX, groups 1, 2).

409, 410. *Freehand Drawing.* (0-4).

Studio and out-door sketching; architectural rendering, advanced water color.

Prerequisite: Architecture 305, 306.
(Required in IX, group 1).

411, 412. *Structural Design.* (0-14, 2-17).

Draughting room methods, design of framed timber structures, design of skeleton steel structures, details of trusses, girders and columns in buildings, critical study of reinforced concrete structures, footings, beams, slabs and columns and simple design in concrete, working drawings and details.

Library research.

Prerequisite: Civil Engineering 330 and concurrent with Civil Engineering 413; in first term, Architecture 312.
(Required in IX, group 2).

414. *Modern Architecture.* (1-0).

An analysis of modern buildings; historic influences; modern developments; tendencies. Lectures; assignments, and reports.
(Required in IX, group 1).

FOR GRADUATES.

501, 502. *Architectural Design.* (0-24).

Design of buildings and groups of buildings. Practice; criticisms; consultations; research.

503, 504. *Architectural Construction.* (4-16).

Theory and practice in advanced constructive design; foundations; walls; frames.

505, 506. *Architectural Practice.* (1-4).

Contracts; specifications; superintendence; office methods.

507, 508. *Architectural Presentation.* (0-6).

Sketching; renderings; color harmony and effects.

315 —(2-2)— Botany of Cotton Plant

DEPARTMENT OF BIOLOGY

Professor Ball, Associate Professors Pratt, Harper, Assistant Professors Miller, Pessin, Mr. Gibbons, Mr. Adams

BOTANY.

101, 102. *General Botany.* (2-4).

The first term begins with an outline of the external and internal form and structure necessary to the more extended study of life processes of plants. In the second term, types of various subdivisions of the plant kingdom are used to illustrate the great fundamental principles of development and adaptation, and to serve as a foundation for later work in classification.

In the laboratory work each student is required to keep a notebook in which he records by drawings and notes the results of his work.

Text: College Botany, Martin.

Laboratory fee, 50 cents each term.

(Required in I, XI, XII, XIV, XVI, XX, XXI).

103, 104. *General Botany.* (2-4).

This course differs from the preceding in being more thorough and advanced.

Text: General Botany, Holman and Robbins.

Laboratory fee, $1.00 each term.

(Required in X).

211, 212. *General Biology.* (2-4).

The structure of animals; elementary vital phenomena; the functions and development of organisms; hygiene and sanitation; the causes and prevention of diseases; discussion of the principal biological theories.

Introduction to the use of the microscope, laboratory, technic, and scientific methods of observation and experiment.

Text: Biology, Scott.

Laboratory fee, $1.00 each term.

(Required in XIX).

303, 304. *Plant Physiology.* (2-4).

An advanced course in physiology in which the functions of respiration, assimilation and nutrition receive especial attention. The course is designed for those who wish to pursue work of higher character in the field of general agricultural botany and at the same time to give, in the practical work, an introduction to the methods of research.

Text: Physiology of Plants, Green.

Laboratory Manual: Practical Physiology of Plants, Darwin and Acton.

Prerequisite: Biology 103, 104.

Laboratory fee, $1.00 each term.

(Elective).

403, 404. *Plant Pathology.* (2-4).

An introduction to systematic mycology in the first term, which is followed by a study of the more important diseases of plants.

Text: Fungi Which Cause Plant Diseases, Stevens.

Prerequisite: Biology 103, 104, 311, 312.

Laboratory fee, $1.00 each term.
(Elective).

416. *Plant Diseases.* (2-4).

This course begins with a study of the biology and classification of fungi with special reference to pathogenic forms. Types of the more important plant diseases occuring in Texas are selected for study and the student is trained to investigate and identify the cause of the trouble and is shown appropriate corrective measures. Plant diseases due to other causes receive attention within the limits of time and material.

In the laboratory, the student studies the form, structure, and biology of selected fungi and learns routine methods of cultivation and identification. Diseased plants are placed before him for individual study and he is instructed in the diagnosis of each disease.

Text: Fungus Diseases of Plants, Duggar.
Prerequisite: Biology 101, 102, 206.
Laboratory fee, $1.00.
(Required in I, group 9).

ZOOLOGY

203, 204. *General Zoology.* (2-4).

The fundamental principles of classification, morphology and physiology of the various phyla of the animal kingdom, with a discussion of life-histories and habits of representative species. In the laboratory, type specimens are dissected.

Text: Manual of Zoology, Hertwig-Kingsley.
Laboratory fee, $1.00 each term.
(Required in X).

207. *General Zoology.* (2-4).

The essential aims and plan outlined in the work in botany are continued in this course. Especial attention is given to forms of economic importance. Types of the various great groups of animals are considered as illustrating origin, development and distribution. Careful dissection and study of type forms, with notes and drawings are required in the laboratory work.

Text: College Zoology, Hegner.
Laboratory fee, $1.00.
(Required in I, XI, XII, XVI, XXI).

317, 318. *Comparative Vertebrate Zoology.* (2-4).

A detailed study of the anatomy of type chordates is undertaken from a comparative viewpoint. The lectures deal with the progressive development and evolution of the organs and organ systems, while in the laboratory the anatomy of the shark, fish, amphibian and mammal is carefully studied.

Text: Comparative Anatomy of Vertebrate, Kingsley.
Laboratory Manual for Comparative Vertebrate Anatomy, Hyman.
Prerequisite: Biology 203, 204.
Laboratory fee, $1.00 each term.
(Elective).

341, 342. *General Physiology.* (3-4).

The structure of the human body; the physiology of the cell; nutrition, chemistry of food, digestion, metabolism; physiology of the muscular, nervous and circulating systems, and of the special senses.

Prerequisite: Biology 203, 204 or 211, 212.

Laboratory fee, $1.50 each term.

(Elective).

419, 420. *General Embryology.* (2-4).

The development of the frog, pig and chick. In the laboratory a detailed study is made of both preserved and living material.

Text: Text-book of Embryology, Prentiss.

Prerequisite: Biology 203, 204, 317, 318.

Laboratory fee, $1.00 each term.

(Elective).

427, 428. *Invertebrate Zoology.* (3-4).

A specialized study of invertebrate animals (excepting insects) with emphasis upon their economic relations.

Text: To be assigned.

(Elective).

431, 432. *Anthropology.* (3-2).

A study of man's place in nature; ancient man; classification of living races; society, religious and ethical ideals, and languages of primitive peoples.

Text: Human Origins, McCurdy.

Prerequisite: Biology 211, 212.

Laboratory fee, $2.00 each term.

(Elective).

BACTERIOLOGY.

206. *Introductory Bacteriology.* (1-4).

An introduction to the study of the nature and relations of bacteria. The laboratory work comprises, in part, the preparation of culture media; of pure cultures; staining and microscopic technique; methods of identification, etc.

Laboratory Manual: Laboratory Methods for Beginners in Bacteriology.

Text: Bacteriology, Buchanan.

Prerequisite: Biology 101, 102.

Laboratory fee, $1.50.

(Required in I, XI, XXI).

305. *Soil Bacteriology.* (1-4).

For students desiring more specialized and extended work than is offered in course 206.

Text: To be assigned.

Prerequisite: Biology 206.

Laboratory fee, $1.50.

(Elective).

309, 310. *General Bacteriology.* (2-4).

The general nature and relations of bacteria, as exhibited in the study of selected types.

In the laboratory, routine methods of isolation, preparation, and study of pure cultures; technical microscopy of bacteria, etc., occupy the time allotted.

Text: General Bacteriology, Jordan.

Laboratory Manual: A Manual of Bacteriology, Reed.

Laboratory fee, $1.00 each term.

Prerequisite:

(Elective).

331. *Dairy Bacteriology.* (2-4).

Application of bacteriology to dairy practices; physiological activities of bacteria; analysis of dairy products; dairy sanitation; bacteriology of diseases of dairy cattle; pasteurization practice and methods used in public health laboratories.

Text: Milk, Heineman.

Prerequisite: Biology 102, 206.

(Elective).

409, 410. *Advanced Bacteriology.* (2-4).

This course is designed for students who elect special work in bacteriology and is adapted to the needs of the groups making the selection.

Laboratory fee, $1.00 each term.

Prerequisite: Biology 103, 104; 309, 310.

(Elective).

418. *Water Bacteriology.* ~~(2-4)~~. (1-4)

The relations of bacteria and similar organisms to water, and water supplies, sewage and sewage disposal.

The laboratory work consists of preparation of culture media; qualitative and quantitative analysis of water, sewage and sewage effluents.

Text: To be selected.

Laboratory fee, $1.50.

(Required in IV, group 2; elective in IV, group 1).

FOR GRADUATES.

501, 502. *Vegetable Morphology.* (2-4).

The life histories of various types of plants beginning with the lower forms and extending throughout the Angiosperms are studied with special reference to structure and reproduction. Special attention is given to the origin and development of sex, the vascular system, the flower, etc., and to the alternation of generations.

The laboratory work includes among other things training in the preparation of permanent microscopic slides.

No text is used but numerous references are given to publications available to the student.

Laboratory fee, $5.00 each term.

503, 504. *Advanced Vertebrate Zoology.* (2-4).

An advanced course in zoology. The theory deals with the comparative anatomy of vertebrate types. The origin, development and evolution of the organs and organ systems, together with the anatomical evidence of evolution are emphasized. Laboratory work; detailed dissection of selected vertebrate types.

Text: Comparative Anatomy of Vertebrates, Kingsley; and Textbook of Zoology, Parker and Haswell, Vol. 2.

Laboratory fee, $5.00 each term.

505, 506. *Advanced Bacteriology.* (2-4).

Advanced methods of bacteriological analysis of water; of milk and foods; of sewage.

Texts: Monographs on the special topics.

Laboratory fee, $5.00 each term.

507. *Diseases of Cotton.* (2-4).

An outline of the life history of the more important diseases of the cotton plant, together with measures of control.

Text: To be assigned.

509, 510. *Advanced Plant Physiology.* (2-4).

An extended study of the responses made by the plant to various external and internal stimuli, especially of gravitation, light, heat, water, and other chemical bodies. It includes an examination of the physiology of growth, nutrition and reproduction.

Experimental investigation of such responses is made in the laboratory work.

Text: To be assigned.

571, 572. *Research in the Physiology of the Cotton Plant.* (2-4).

This course is designed for students who specialize in cotton. Thorough studies are made of the structure of the cotton plant, its metabolism, its response to various fertilizers, and to temperatures of air and soil, its normal requirements for fertilization, and abnormal conditions resulting in the shedding of its blossoms. Dr. Taubenhaus.

DEPARTMENT OF CHEMISTRY AND CHEMICAL ENGINEERING

Professor Hedges, Professors Thornton, Brayton, Burchard, Associate Professors Stone, Jensen, Assistant Professors Koenig, L. G. Jones, Mr. B. C. Jones, Mr. Harter, Mr. Bauer, Mr. Voges, Mr. Bishop, Mr. Harrington, Mr. Snuggs, Mr. Tidwell.

CHEMISTRY

101, 102. *General Inorganic Chemistry.* (3-3).

Foundation principles of all chemical activity are fully discussed and demonstrated. Industrial applications of the more important chemical processes are briefly described, and organic chemistry is touched upon. This course must precede all other chemical studies. An elementary course in physics should precede or accompany this course.

Text: General Chemistry, McPherson and Henderson.

General laboratory work, duplication of lecture experiments and simple tests of technical importance. The laboratory work of the second term deals with qualitative analysis.

Laboratory fee, $3.50 each term.

(Required in XVII and in all four-year courses except X, XIII, XVI, XIX, XX, XXI).

103, 104. *Inorganic Chemistry.* (3-4).

Same as course 101, 102, with the addition of one hour of laboratory practice per week.

Laboratory fee, $3.50. each term

(Required in X; elective in XIX).

205. *Qualitative Analysis.* (2-8).

This course includes both the theory and practice of fundamental analytical operations and is designed to enable the student to make a rapid and accurate analysis of substances of average complexity, and to understand the steps by which his results are obtained.

The laboratory work consists of a study of the properties and reactions of the more common basic and acidic radicals, their separation and identification from mixtures, the methods of getting solids into solution for analysis and the analysis of unknown substances. The number of substances analyzed varies with their nature and complexity.

Text: Qualitative Analysis, Steiglitz, Part I, and Noyes, A. A.

Prerequisite: Chemistry 101, 102.

Laboratory fee, $6.00.

(Required in VIII; elective in X).

206. *Organic Chemistry.* (3-2).

The subject is treated primarily as a pure science. An effort is made to select for illustrations such compounds as are of interest to the student of agriculture.

Text: Organic Chemistry, Moore.

In the laboratory a study is made of the properties and typical reactions of the compounds discussed in the lectures.

Prerequisite: Chemistry 101, 102.

Laboratory fee, $2.50.

(Required in I, VI, XI, XII, XVII, XXI).

207. *Quantitative Analysis.* (2-3).

A considerable portion of the class-room time is devoted to chemical calculations involved in the practice.

The laboratory work consists of a number of carefully selected experiments in quantitative analysis designed to typify operations of general application.

Prerequisite: Chemistry 101, 102.

Laboratory fee, $3.00.

(Required in III, VI).

208. *Technical Analysis.* (1-3).

This course is designed to give the student an insight into the methods employed in the analysis of materials connected with his profession and the application of the results obtained to practical problems. The work in the laboratory is discussed and explained, and its application to engineering problems emphasized.

Fuels, steels, cements, waters for industrial purposes, and industrial products

commonly met with, are analyzed by rapid technical methods.
Prerequisite: Chemistry 207.
Laboratory fee, $3.00.
(Required in III, VI).

301, 302. *Organic Chemsitry.* (3-4).
An introduction to the chemistry of the compounds of carbon. A study of the general principles, and of their application to various industrial processes.
The laboratory work serves as a basis for the course. The student here familiarizes himself with the reactions, properties and relations of typical organic compounds.
Laboratory fee, $6.00 each term.
Prerequisite: Chemistry 101, 102.
Text: Organic Chemistry, Norris.
(Required in VIII; elective in X).

308. *Dyeing.* (2-4).
A study of the physical and chemical properties of textile fibers, dyes, dyestuffs, and mordants, together with the principles and appliances involved in the commercial coloring of textiles, especially of cotton and woolen goods.
Most of the principles discussed in the theory are tested in the laboratory, with especial attention to the production of dyes to meet particular commercial requirements.
Prerequisite: Chemistry 206.
Laboratory fee, $2.00.
(Required in VI, XVII).

309. *Agricultural Chemistry.* (3-3).
A study of the fundamental chemical principles of agriculture; the application of chemistry; the chemical terms used in Experiment Station literature; the chemistry of plant substances, soils, irrigation water, fertillizers, insecticides, and fungicides.
The laboratory work consists of the chemical analysis of feeds, fertilizers, insecticides, and fungicides.
Text: Chemistry of Agriculture, Stoddard.
Prerequisite: Chemistry 206.
Laboratory Manual of Agricultural Chemistry, Hedges and Bryant.
Laboratory fee, $3.00.
(Required in I, XII).

312 – Organic Analysis (1-3)

438. *Seminar.* (1-0).
(Required in VIII).

441. *Analysis of Water and Sewage.* (2-3).
Sanitary Analysis of Water and Sewage.
Laboratory fee, $2.00.

314 – Dairy Chemistry (3-4)
FOR GRADUATES

501, 502. *Advanced Agricultural Chemistry* . (3-4).
Same as course 309, with more advanced work.
Laboratory fee, $5.00 each term.

503, 504. *Advanced Industrial Chemistry.* (2-8).
A study of industrial processes.
Laboratory fee, $5.00 each term.

507, 508. *Advanced Organic Chemistry.* (2-8).
Preparation of Organic compounds.
Laboratory fee, $5.00 each term.

509, 510. *Cotton Seed Oil.* (2-4).
A study of cotton seed oil production and refining.
Laboratory fee, $5.00 each term.

571, 572. *Special Topics in the Chemistry of Animal Nutrition.* (2-6).
This course deals with vitamines, amio acids, mineral contents of feeds, productive protein, and productive energy as related to animal nutrition.
The laboratory work is under Agricultural Experiment Station conditions and includes analyses of feeds, experiments, and a thesis in the chemistry of animal nutrition. Dr. Fraps.

573, 574. *Special Topics in the Chemistry of Animal Nutrition.* (2-6).
A continuation of course 571, 572. Dr. Fraps.

575, 576. *Special Topics in the Chemistry of Soils.* (2-4).
This course will include the study of soil acidity, phosphoric acid, potash, and nitrogen related to crops, and similar topics by means of books, bulletins, original articles, and the preparation of the reports. The laboratory work accompanying the course will depend upon experience of the student. Dr. Fraps.

CHEMICAL ENGINEERING

The foundation for the work in chemical engineering is laid in the courses in chemistry already described. Chemistry and chemical engineering cover such a broad field that in the senior year students are advised to specialize in some branch of technical analysis such as its application to the cotton seed oil industry, petroleum technology, problems of sanitation, or the chemical control of a cement plant. All the work is supplemented by laboratory work. The chemical industries most highly developed in this State are inspected from time to time.

202. *Elementary Quantitative Analysis.* (2-8).
An introduction to the methods of exact analysis, as preliminary training for the more advanced courses. In the class room the practice and theory of the laboratory exercises are dealt with by lectures and recitations. Special attention is given to stoichiometry.
The laboratory work consists of a number of carefully selected experiments in quantitative analysis designed to typify operations of general application. The work is first gravimetric, then volumetric. In the early periods compounds of known composition and purity are analyzed, but later substances of industrial significance, whose percentage composition is known only to the instructor, are undertaken. Near the close of the term an analysis is made of a carbonate

or silicate rock for the commonly determined constituents.

Texts: Quantitative Chemical Analysis, Smith; Calculations of Analytical Chemistry, Miller.

Prerequisite: Chemistry 205.

Laboratory fee, $6.00.

(Required in VIII; elective in X).

301. *Quantitative Analysis.* (2-8).

Lectures, recitations and conferences dealing with technical methods of analysis, both rapid and exact. Before beginning an analysis the student is required to consult current literature and standard books of reference and present a written outline for criticism and suggestion.

The laboratory work comprises the analysis of limestone, fuels, lubricating oils, gas, boiler water, iron and steel, alloys, ores, paint, soap, sugar, asphalt and other materials of engineering and industrial importance.

Text: Quantitative Analysis, Mahan.

Prerequisite: Chemical Engineering 202.

Laboratory fee, $6.00.

(Required in VIII).

407. *Industrial Chemistry.* (3-0).

The principal applications of chemical process to commercial products, mostly organic in nature, such as gas manufacture, petroleum products, soaps, the starch and sugar industries, and the manufacture of paper, leather, and explosives; the manufacture of fertilizers, cement and ceramics.

Text: Industrial Chemistry, Benson.

Prerequisite: Chemistry 101, 102.

(Required in III).

408. *Metallurgy of Iron and Steel.* (2-0).

Metallurgy of iron and the manufacture of steel are considered in detail, with especial attention to the nature and location of valuable iron ore deposits, together with suitable fluxes; the nature and availability of proper fuels, together with the furnaces used; the constitution of the resulting pig iron and the manufacture of steel therefrom; the chemistry of the different kinds of steel and their adaptibility in engineering practice. Lectures and recitations.

Text: The Metallurgy of Iron and Steel, Stoughton.

Prerequisite: Chemistry 101, 102.

(Required in III).

411. *Physical Chemistry.* (5-0).

Physical explanation of chemical and allied phenomena, together with a mathematical exposition of the laws involved. Some of the subjects thus developed are the atomic theory, the periodic law, solubility, fusion, vaporization, the phase rule, dissociation in solution, chemical equilibrium, and relative chemical activity. The course leads up to the consideration of the best research of today. Most of the theoretical conclusions deduced in the class room are confirmed in the laboratory in the following term. Lectures and recitations.

Prerequisite: Chemistry 301, 302.

(Required in VIII).

414. *Sanitary Chemistry.* (3-4).

Sanitary examination of food, milk, and milk products, and the sanitary analysis of water, including water treatment methods. Methods of purification of water, as the use of sand filters, coagulants, and algicides; sources of pollution of water and milk supplies and their relation to public health are discussed; problems common to the sanitary chemist and engineer.

Prerequisite: Chemistry 206 or 301, 302.

Laboratory fee, $5.00.

(Elective).

415. *Industrial Chemistry.* (3-6).

Lectures and conferences dealing with technical processes and their application to the industries and the construction and operation of industrial chemical plants. As the work of the student diverges individual conferences are arranged with each during which his particular problems are discussed. Reference is made to the library and current technical literature.

Text: Industrial Chemistry, Thorp.

Prequisite: Chemical Engineering 302.

Laboratory fee, $6.00.

(Required in VIII).

416. *Chemical Technology.* (3-4).

The application of chemical theories and laws to industrial processes, organic chemical processes being emphasized, especially those dealing with the refining of petroleum, cotton seed oil, and sugar.

Prerequisite: Chemical Engineering 415.

Laboratory fee, $5.00.

(Required in VIII).

418. *Physical Chemistry.* (1-8).

Calibration of apparatus, determination of molecular weights, heats of reaction, laws of mass action and other related topics; experiments dealing with electrical phenomena. A few experiments illustrating electro-chemical processes of commercial importance are performed.

Prerequsite: Chemistry 301, 302.

Laboratory fee, $5.00.

(Required in VIII).

DEPARTMENT OF CIVIL ENGINEERING

Professor Richey, Professors McNew, Munson, Associate Professor MacLean, Assistant Professor Sandstedt, Mr. Doremus, Mr. Wright, Mr. Johnson

201. *Plane surveying.* (3-4).

Chaining; the adjustment, use and care of compass, transit, level, plane table and hand instruments; measurement of angles; land surveys and computations; stadia, topographic, city and general surveying; observations for true meridian and latitude; plotting results.

Texts: Principles and Practice of Surveying, Vols. 1 and 2, Breed and Hosmer; Manual of Surveying, R. E. Davis.

Prerequisite: Mathematics 103.
Laboratory fee, 75 cents.
(Required in IV, XV).

202. *Raliroad Engineering.* (2-3).

Outlining reconnaisance, preliminary, and location surveys; computing and staking out simple and compound curves; changes in alignment, and connecting curves.

Text: Field Manual for Railroad Engineers, Nagle.
Laboratory fee, 75 cents.
Prerequisite: Civil Engineering 201.
(Required in IV).

204. *Analytical Mechanics.* (3-0).

Fundamental principles; coplanar and non-coplanar forces; centroids; friction; moment of inertia; rectilinear motion; rotation; work, energy, and power.

Text: Applied Mechanics, Poorman.
Prerequisite: Mathematics 203; to be accompanied by Mathematics 204.
(Required in IV, IX, group 2; XV).

206. *Plane Surveying.* (1-3).

A modification of course 201.

Fundamental principles of surveying, use of transit and level in making layouts of buildings, running profile surveys for pipe lines, etc.

Text: Manual of Surveying, R. E. Davis.
Prerequisite: Mathematics 103.
Laboratory fee, 50 cents.
(Required in V, VI, VIII, IX, group 2).

300. *Field Practice. Summer following Sophomore Year; 3 Weeks.*

Adjustment of instruments; observations on Polaris and on the sun for azimuth; base line measurement; leveling; triangulation; survey of a portion of the College lands by transit and stadia, also by plane table; mapping; boundary survey and computation of area by latitudes and departures.

Full working days are spent in field and office during the entire course.

Reference text: Principles and Practice of Surveying, Vols. 1 and 2, Breed and Hosmer, together with additional notes by the instructors.

Laboratory fee, $1.00.
(Required in IV, XV).

303. *Railroad Engineering.* (2-3).

A continuation of course 202, covering transition curves, frogs and switches, turnouts, vertical curves, earthwork, overhaul, estimates conforming to I. C. C. rulings, track facilities for industrial plants.

Text: Field Manual for Railroad Engineers, Nagle.
Prerequisite: Civil Engineering 202.
Laboratory fee, 75 cents.
(Required in IV).

305. *Mechanics of Materials.* (3-0).

The resistance of materials and the mechanics of pipes, riveted joints, beams, columns, shafts, etc. Elastic curve and the deflection of beams, combined stresses, resilience, and impact.

Text: Resistance of Materials, Seely.

Prerequisite: Mathematics 204; Civil Engineering 204 or equivalent.

(Required in III, IV, V, IX, group 2; XV).

306. *Masonry.* (2-0).

Brick and stone masonry; cement and aggregates; theory of proportioning concrete; methods of mixing, placing, and caring for concrete; foundations; plain concrete structures, including dams, retaining walls, abutments, piers, culverts; forms and falsework.

Text: Design of Masonry Structures and Foundations, Williams.

Prerequisite: Civil Engineering 305.

(Required in IV).

311. *Hydraulics.*. (3-2).

The laws governing the action of water at rest and in motion, as related to engineering problems; the flow of water in pressure mains, sewers, acqueducts, open channels, and in rivers; measurement of the flow of water by nozzles, orifices, weirs and meters; estimates for water supply and water power; theory and efficiency of water wheels, motors, turbines, rams and pumps.

The practice consists of calibration of nozzles, orifices, water meters, weirs, pressure gauges; efficiency tests on impulse motors, hydraulic ram, and one, two and three-stage centrifugal pumps.

Text: Hydraulics, King and Wisler.

Prerequisite: Mathematics 203.

(Required in IV, XV; elective in VIII).

315. *Strength of Materials Laboratory.* (0-2).

Determination of the strength, ductility, modulus of elasticity, and other properties of engineering materials. Tests of timber, steel, cast iron, cement, etc., and reports showing results.

Prerequisite: Civil Engineering 305 or registration in Civil Engineering 305.

Laboratory fee, $1.00.

(Required in IV, IX, group 2).

320. *Topographic Drawing.* (0-2).

Practice in making the common conventional signs in topographic drawing; map drawing; use of contour maps for choosing alignment, computing drainage areas, and making estimates of earthwork.

Prerequisite: Civil Engineering 201, 300.

(Required in IV).

328. *Strength of Materials Laboratory.* (0-2).

Same as the practice given in course 315.

Laboratory fee, $1.00.

(Required in III, V, XV).

330. *Framed Structures.* (3-6).

Review of resolution and composition of forces; the three fundamental equations of static equilibrium applied to various systems of forces; algebraic and graphical methods of analysis of simple trusses, and plate girders; loads and stresses for roof trusses; loads and stresses for bridges; influence lines for beams and trusses; method of coefficients for truss stresses.

The practice consists chiefly in the graphical determination of stresses for trusses and the design of beams and truss members.

Text: Theory of Structures, Spofford.

Prerequisite: Mathematics 204; Civil Engineering 204, 305.

(Required in IV).

330a. *Framed Structures.* (3-3).

A modification of course 330, with greater emphasis on graphical methods; stresses in beams, roof trusses, and mill building bents.

Practice, graphical solutions in reactions and stresses.

Text: Graphical Analysis, Wolfe.

Prerequisite: Civil Engineering 305.

(Required in IX, group 2).

334. *Contracts and Specifications.* (2-0).

A brief study of the law of contracts as applied to engineering operations; the relation of the engineer to the owner and to the contractor; the necessity for, and preparation of, engineering specifications and the accompanying documents; general and specific clauses in specifications; illustrative examples.

Text: Elements of Specification Writing, Kirby; Contracts in Engineering, Tucker.

(Required in IV, XV).

400. *Field Practice. Summer Following Junior Year; 3 Weeks.*

Reconnoisance, preliminary, and location surveys for proposed railroad; survey for proposed highway. Full working days in the field, with rotation of duties in all the usual operations such as running out the preliminary line with transit, leveling, making land line surveys, drainage area surveys, taking topography, plotting preliminary notes, making paper location, running the located line, cross sectioning.

Reference texts: Design of Railway Location, Williams; Field Manual for Railroad Engineers, Nagle.

Laboratory fee,$1.50.

Prerequisite: Civil Engineering 303.

(Required in IV).

401. *Railroad and Highway Drafting.* (0-3).

Office work, consisting in making a map, a profile, and an estimate for the line located in course 400.

(Required in IV, groups 1, 2).

403. *Roofs and Bridges.* (3-6).

Continuation of the work begun in course 300. Deflections of trusses, Williot diagrams; working stresses; study of behavior of tension and compression members; riveted joints; design of railway plate girder, low riveted highway

bridge, and roof truss; pins and pin plates.

In the practice, graphical determinations of truss deflections, design and general drawing of a railway plate girder; design and general drawing for low riveted highway bridge.

Text: Modern Framed Structures, Part III, Johnson Bryan and Turneaure.

Prerequisite: Civil Engineering 330.

(Required in IV, group 1).

404. *Bridge Design.* (0-4).

A continuation of the practice in course 403; design and general drawing for through riveted highway bridge.

Text: Structural Engineer's Handbook, Ketchum.

Prerequisite: Civil Enginering 403.

(Required in IV, group 1).

407. *Roads and Pavements.* (3-0).

A brief study of country roads and city pavements. Highway location, design, construction and maintenance; road laws, finances, organization and supervision briefly considered.

The text is supplemented by lectures, the use of bulletins, models and samples of materials.

Text: Construction of Roads and Pavements, Agg.

Prerequisite: Civil Engineering, 201, 204.

(Required in IV, XV).

411. *Hydraulics.* (3-0).

Same as course 311, except that no practice is given.

(Required in III; elective in V).

413. *Elements of Reinforced Concrete.* (2-0).

Theory of stress distribution in plain and reinforced concrete beams; derivation of working formulas for rectangular reinforced beams and T-beams; stress determination and elementary design of beams; theory, investigation, and design of reinforced columns; beams with double reinforcement.

Text: Design of Concrete Structures, Urquhart and O'Rourke.

Prerequisite: Civil Engineering 305.

(Required in IV, groups 1, 2; IX, group 2).

414. *Reinforced Concrete Design.* (1-5).

A study of the design of various types of reinforced concrete structures, such as buildings, bridges, retaining walls, culverts. Practice is had in the making of simple designs and working drawings.

Text: Same as in course 413.

Prerequisite: Civil Engineering 413.

(Required in IV, groups 1, 2; IX, group 2).

417, 418. *Highway Materials.* (2-3, 1-4).

Origin, production, specifications, and tests of bituminous and non-bituminous materials and mixtures used in the construction and maintenance of roads and pavements. Bituminous materials in the first term and non-bituminous materials in the second term.

Text: Laboratory Manual of Bituminous Materials, Hubbard; Sampling

and Testing of Highway Materials, Barton and Doane.
Prerequisite: Senior classification in engineering.
Laboratory fee, $3.00, first term; $2.00, second term.
(Required in IV, group 2).

423. *Bridge Design.* (2-4).
Types of highway bridges; calculation of stresses; design of bridge floors; beam bridges; plate girders; high and low truss bridges; bridge details.
The practice consists chiefly in making design computations and general drawings for a low riveted truss bridge in accordance with a given set of specifications.
Text: Design of Highway Bridges, Ketchum.
Prerequisite: Civil Engineering 330.
(Required in IV, group 2).

434. *Irrigation and Drainage.* (3-0).
Determination of the quantity of water available; collection and storage works; design, location and construction of distribution systems; economic use and duty of water in irrigation; water rights. Drainage of overflowed lands is presented briefly by lectures.
Text: Irrigation Engineering, Wilson and Davis.
Prerequisite: Civil Engineering 311.
(Elective in IV, groups 1, 2).

443. *Materials of Construction.* (~~0-4~~ 1-3).
A laboratory study of the suitability of various materials of engineering, including brick, stone, sand, gravel, cement, mortars, concrete, and bituminous paving materials.
Prerequisite: Civil Engineering 407 or registration in that course.
Laboratory fee, $2.00.
(Required in IV, groups 1, 3).

446. *Highway Administration.* (3-0).
Study of highway laws, the administration of street and highway improvements, and the procedure followed in planning and executing municipal street improvements.
Text: To be assigned.
Prerequisite: Civil Engineering 407.
(Elective in IV, groups 1,2).

448. *Engineering Economics.* (2-2).
Study of first cost and operating cost, business units and business statistics; valuation; cost estimating; engineering reports.
Text: Engineering Economics, Fish.
Prerequisite: Senior or junior classification, engineering courses.
(Elective in IV, groups 1, 2).

450. *Reinforced Concrete Construction.* (3-3).
An abbreviation of courses 413, 414.
Text: Same as in courses 413, 414,
Prerequisite: Civil Engineering 305.
(Required in IV, group 3).

FOR GRADUATES.

521, 522. *Advanced Stress Analysis.* (2-4).

Stresses in statically indeterminate frames; deflections; secondary stresses; elastic arches; cantilever, continous, and swing bridges.

523, 524. *Structural Design.* (1-6).

Reinforced concrete arch bridges; concrete buildings; steel buildings.

525, 526. *Highway Construction and Materials.* (2-4).

Highway design and construction, including location, drainage, foundations, types, costs. Laboratory and field investigations of highway materials and pavement mixtures.

527, 528. *Hydraulic Engineering.* (4-0).

Hydrology, water power development, flood control.

529, 530. *Railway Engineering.* (2-4).

Railway expenditures; valuation; operating costs; locomotive performance; speed-distance and time-distance curves; virtual profile; betterment surveys including grade revision, change of alignment, etc.

DEPARTMENT OF DAIRY HUSBANDRY

Professor Grout, Professors Clutter, Darnell.

101. *Judging Dairy Cattle.* (0-2).

Scoring and judging of dairy cattle; determination of correlation between type and production

(Required in I, XII, XVI, XX, XXI).

202. *Dairying.* (2-2).

The secretion of milk; composition of milk and its products; use and application of the lactometer; methods of cream raising and separation; system of making farm butter and ice cream.

Text: Milk and Its Products, Wing.

Laboratory fee, 75 cents.

(Required in I, XII, XV, XVI, XXI).

301. *Market Milk.* (2-2).

Food value of milk; handling and sale of sanitary milk; city milk inspection.

Text: Market Milk, Kelley and Clement.

Prerequisite: Dairy Husbandry 202.

Laboratory fee, $1.00.

(Required in I, group 7; XI).

304. *Advanced Dairy Cattle Cattle Judging.* (0-2).

A further study of comparative judging of dairy cattle.

References assigned.

Prerequisite: Dairy Husbandry 101.

(Elective).

306. *Butter Making and Factory Management.* (3-2).

Types of creameries; raw product; grading; pasteurization; use of commercial starters; ripening; churning; salting and working butter; explanation of various physical phenomena in making, packing and storing butter. Creamery location and plans; business accounting as applied to management in various types of creameries.

Text: The Butter Industry, Hunziker.
Prerequisite: Dairy Husbandry 202.
Laboratory fee, $1.00.
(Required in I, group 7).

404. *Seminar.* (2-0).

Review of dairy literature; oral and written reports on selected research bulletins.

Prerequisite: Dairy Husbandry 101, 202, 301.
(Elective).

406. *Dairy Cattle Feeding and Management.* (3-2).

Breeding, feeding, care and management of dairy cattle.
Text: Dairy Cattle and Milk Production, Eckles.
Prerequisite: Animal Husbandry 303, and Genetics 301.
Laboratory fee, 75 cents.
(Required in I, group 7).

407. *Ice Cream Making and Refrigeration.* (2-2).

Mixing and freezing ice cream; sherbets and other frozen products, and the physical principles involved; types of freezers: flavoring materials; fillers; binders; ice cream standards; the theory and practice of artificial refrigeration and its use in the ice cream plant.

Lectures: references assigned.
Prerequisite: Dairy Husbandry 202.
(Elective).

408. *Advanced Study of Dairy Breeds.* (1-4).

Historical study of prominent families and individuals of the major dairy breeds.

Prerequisite: Dairy Husbandry 101, 202; Genetics 301.
(Elective).

FOR GRADUATES.

501, 502. *Advanced Dairy Production.* (2-4).

An advanced study of general production problems.

503, 504. *Advanced Dairy Manufactures.* (2-4).

An advanced study of general manufacturing problems.

FOR STUDENTS IN SHORT COURSES.

23. *Farm Dairying.* (3-2).

An elementary course in selecting and handling dairy cattle; rearing dairy calves; methods of milking; testing milk; care and handling milk and dairy products on the farm.

Text: Farm Dairying, C. Larsen.
Laboratory fee, $1.00.
(Required in C).

DEPARTMENT OF DRAWING

Professor A. Mitchell, Assistant Professor Milner, Mr. Simonds, Mr. Beaumont, Mr. Davis.

101. *Mechanical Drawing.* (0-2).

Care and use of drawing instruments, simple exercises in the use of drawing instruments, free-hand lettering, geometrical construction, construction of plane curves, orthographic and axonometric projections.

Text: Mechanical Drawing, Giesecke and Mitchell.
(Required in all four-year engineering courses and in XIII, XV, XVII).

103. *Descriptive Geometry.* (3-0).

Problems relating to points, lines, planes and solids.
Text: Descriptive Geometry, Giesecke and Mitchell.
(Required in all four-year engineering courses).

103a. *Descriptive Geometry.* (2-0).

A modification of course 103.
(Required in IX, XX).

104. *Descriptive Geometry.* (2-2).

Problems relating to the intersection of planes and solids, intersections of solids, development of surfaces, shades and shadows, linear perspective; representation of objects in the first and third angles.

Text: Theory, Descriptive Geometry, Giesecke and Mitchell. Practice, Instrumental Exercises, Descriptive Geometry, Mitchell.
Prerequisite: Drawing 103.
(Required in all four-year engineering courses).

108. *Mechanical Drawing.* (0-2).

Freehand lettering, conventions, section lining, threads, bolts, rivets, helixes, dimensioning drawings, principles of working drawings.

Text: Mechanical Drawing, Giesecke and Mitchell.
Prerequisite: Drawing 101.
(Required in all four-year engineering courses and in XIII, XV).

201, 202. *Mechanical Drawing.* (0-2).

A continuation of course 108 including elementary parts of machines and engineering structures; details and assemblages; Patent Office drawings, tracing, blue printing.

The course is varied to meet the practical needs of students in the different engineering departments.

Text: Mechanical Drawing, Giesecke and Mitchell.
Reference text: Engineering Drawing, French.
Prerequisite: Drawing 108.
(Required in IV, V, VI, VIII, XIII).

219, 220. *Freehand Drawing.* (0-2).

Drawing from specimens of plant and animal life and from apparatus used in scientific work.

(Required in VIII; elective in X).

222. *Mechanical Drawing.* (0-2).

Similar to course 101.

(Required in XIV).

DEPARTMENT OF ECONOMICS

Professor Clark, Professor Davison, Assistant Professors Handrick, Daugherty.

203, 204. *Principles of Economics.* (3-0).

A general course in the fundamental principles of economics, including the theory of economic activities concerning production, distribution and consumption; the practical economic problems of money, credit and banking, foreign exchange, tariff, transportation, trusts, insurance, taxation.

Text: Taussig's Principles of Economics.

(Required in X, XIII, XIV, XVIII, XIX).

215. *Stock Markets.* (3-0).

The aim of the course is to present in a comprehensive and non technical manner the numerous services of the organized stock market to the individual investor and to financial and other business enterprises. It also aims to bring together in compact and classified from those facts, principles and practices of the business which enables the student to have a clear understanding of the nature of organized security markets and the legitimate ways in which they may be employed.

(Required in XVIII).

309. *Labor Problems.* (3-0).

This course deals with theories of wages, development of trade unions and labor unions, proposals for the solution of labor problems, labor legislation, and other problems growing out of modern industrial development.

Prerequisite: Economics 203, 204 or its equivalent.

Text: To be selected.

(Elective in XIV).

311. *Money and Banking.* (3-0).

The evolution of money, the various forms of credit, the history of banking institutions, banking in other countries, the Federal Reserve System, and current monetary and banking problems.

Text: Westerfield's Banking Principles and Practice.

Prerequisite: Economics 204, 305, 306, or 403.

(Required in VI, XIV, XVIII).

315. *Economics of Insurance.* (3-0).

This is an introductory course dealing with the historical development and general economic aspects of the insurance business. Special attention will be given to property and life insurance.

Text to be selected.
Prerequisite: Economics 203, 204 or their equivalent.
(Elective in XIV).

316. *Business Law.* (3-0).
Such objects as the following are studied; the nature and scope of law, contracts, sales agency, negotiable instruments, employment, personal property, real property, wills and inheritances, surety, bankruptcy. Supplementary studies of Texas laws, and of court decisions.
Text: Business Law, Conynton and Bergh; Clark's Outline.
(Required in VIII, XIV, XVIII, XX).

403. *Principles of Economics.* (3-0).
This is a general course in the fundamental principles of economics. It deals with the theory of economic activities concerning production. distribution and consumption, and the practical economic problems of money, credit and banking, foreign exchange, tariff, transportation, taxation, trusts, insurance. The same ground is covered as in course 203, 204, but in a more compact way.
Texts: Principles of Economics, Seager.
Questions on the Principles of Economics, Day and Davis.
(Required in I, III, IV, V, VI, VIII, IX, XII, XV, XVI, XX, XXI).

408. *Corporation Finance.* (3-0).
The common forms of business organization, with special attention to corporations; advantages and disadvantages of incorporation, formation and organization of corporations, capital stock and bonds, legal status of corporations, bankruptcy and reorganization.
Text: The Financial Policy of Corporations, Dewing.
(Elective in all engineering courses and in XIV, XV).

410. *Foreign Trade and Exchange.* (3-0).
This course treats of the principles of international commerce, methods of conducting foreign trade, and the theory and practice of foreign exchange.
Prerequisite: Economics 306 or 403 or the equivalent.
Text to be selected.
(Elective in XIV).

FOR GRADUATES

501, 502. *History of Economic Doctrines.* (3-0).
The purpose of this course is to study in detail, beginning with the Physiocrats, the growth of the science of economics. A careful study is made of the various schools of economists, and an analysis is made of such fundamental concepts as production, value, capital, wages, interest, profits, etc., as they have appeared from time to time in the writings of leading economists. Gide and Rist's History of Economics Doctrines serves as a guide into these authorities.

503, 504. *Advanced Economic Theory.* (3-0).
This is a comparative study of the doctrines as they appear in modern economic literature. The purpose is, so far as possible, to associate the modern economists with any of the older schools to which they may logically belong or to give them distinctive positions to which their writings may entitle them. A critical study is made of Gide's Political Economy with the view of forming a background in accepted doctrines as a basis of the comparative estimates made.

DEPARTMENT OF ELECTRICAL ENGINEERING

Professor Bolton, Professor M. C. Hughes, Associate Professors Yates, Markle, Assistant Professors Fouraker, McMurtray, Rode, Mr. Longley, Mr. Ward

201. *Electricity and Magnetism.* (4-4).

Lectures, recitations and problems in electricity and magnetism.

A laboratory investigation of the phenomena studied in the text-book.

Prerequisite: Mathematics 102, 103, 104.

Laboratory fee, 75 cents.

(Required in V).

202. *Elementary Electrical Engineering.* (2-4).

Simple electric circuits, primary and secondary batteries, battery charging, simple telephone circuits, the magnetic circuit, inductance, and capacity.

A short time is devoted to the study of the National Electric Code, and of methods of wiring.

The practice includes the accurate measurement of various electrical quantities, such as resistance, inductance, capacity, and the effect of temperature, position, etc., on these quantities; a study of the various types of batteries to determine their adaptability to different uses; calibration and repair of instruments, such as ammeters, voltmeters, and watt-meters; tests of the magnetic properties of iron.

Prerequisite: Electrical Engineering 201, Mathematics 104.

Laboratory fee, 75 cents.

(Required in V).

301. *Direct Currents.* (4-6).

A study of the theory, design, and applications of direct current machinery.

The practice includes the operation of dynamos and motors, the determination of characteristics and the measurement and calculation of losses, efficiencies and regulation.

Prerequisite: Electrical Engineering 202, Mathematics 204.

Laboratory fee, $1.50.

(Required in V).

302. *Alternating Currents.* (5-6).

The principles of alternating currents, including the relations of voltage, current, resistance, inductance and capacity.

An experimental study of the effect of resistance, reactance, and capacity on alternating current circuits; the determination of wave shapes; and tests of some of the simpler types of alternating current machines.

Prerequisite: Electrical Engineering 301, Mathematics 204.

Laboratory fee, $1.50.

(Required in V).

305. *Electrical Machinery.* (3-3).

A general study of dynamos, motors and transformers of the types most commonly met with in general engineering practice. The course is abbreviated so that only the more fundamental principles are studied.

The practice is designed to give the general engineering student a slight degree of familiarity with the operation and the more important characteristics of both dirct current and alternating current machines.

Prerequisite: Physics 204, Mathematics 204.

Laboratory fee, $1.00.

(Required in IV, VIII, XV).

307, 308. *Electrical Machinery.* (3-0, 2-3).

The fundamental principles of direct and alternating current machinery, and the operating characteristics of electrical machinery usually installed in power plants and electrically operated industrial enterprises.

Practice includes the operation of the principal types of electric motors, generators and transformers and the study of their operating characteristics.

Prerequisite: Physics 204, Mathematics 204.

Laboratory fee, $1.00, second term.

(Required in III, VI).

309, 310. *Communication Engineering.* (2-0, 2-2).

The principles of electric communication engineering, including the study of telegraph circuits, repeaters, multiplex and printing telegraphy; the principles of automatic telephony; and basic principles of radio engineering, including the vacuum tube.

Practice includes an experimental study of circuits and instruments covered in the course, emphasizing fundamental principles rather than mechanical details of modern practice.

Prerequisite: Electrical Engineering 201, 202. Must be accompanied by Electrical Engineering 301, 302.

Laboratory fee, $1.00, second term.

(Elective in V).

401, 402. *Alternating Current Machinery.* (4-7, 4-6).

A graphical and mathematical study of alternating current machinery, including generators, transformers, motors and converters.

The experimental determination of the characteristics of various types of alternating current machines.

Text: Principles of Alternating Current Machinery, Lawrence.

Laboratory fee, $1.50, each term.

Prerequisite: Electrical Engineering 302 or 308.

(Required in V).

406. *Electric Power Transmission.* (3-0).

Lectures and recitations on the transmission and distribution of power by electrical methods, including the design and cost estimates of several transmission and distribution systems.

Prerequisite: Electrical Engineering 401.

(Elective in V).

409, 410. *Advanced Communication Engineering.* (2-$\frac{2}{3}$, 1-$\frac{2}{3}$).

Advanced telephone, telegraph and radio engineering including a more advanced study of vacuum tubes and their application in radio receiving and transmitting circuits, and in carrier current telegraphy and telephony.

414. Radio Communication (3-0)
The principles of Radio Communication, including the study of vacuum tubes.
Prerequisite: EE 302 or 308. Elec. in V.

The laboratory study of circuits and instruments studied in the course emphasizes fundamental principles rather than the mechanical details of modern practice.

Prerequisite: Electrical Engineering 309, 310.

(Elective in V).

424. *Electric Railways.* (2-2).

A study of railway apparatus; costs of construction and operation of electric railway systems; operating methods.

The test of electric railway motors, controllers, and other appliances; tests of electric cars.

Prerequisite: Electrical Engineering 301.

(Elective in V).

425. *Illumination.* (2-2).

The principles of illumination; the design of lighting systems for buildings of various types.

Tests of lighting units and of complete systems both for interior and exterior use.

Prerequisite: Electrical Engineering 302.

Laboratory fee, 50 cents.

(Elective in V).

427. *Telephone Engineering.* (2-2).

A study of the engineering principles used in telephone communication including transmission problems, inductive interference, transpositions, phantom circuits, repeaters and other modern developments in telephone engineering.

Prerequisite: Electrical Engineering 301, 305, or 307.

(Elective in V).

431. *Engineering Administration.* (2-0).

A brief study of problems of engineering administration, including the law of contracts, the preparation of engineering specifications, records to be kept in engineering construction and operation, systems of organizations required.

Must be accompanied or preceded by Economics 403.

(Required in V).

432. *Public Utility Problems.* (3-0).

Lectures and recitations on the problems of operation of public utilities, with particular attention to methods of organization, the fixing of rates, and the economic features of new lines and extensions.

Prerequisite: Electrical Engineering 401, 431.

(Required in V).

434. *Design and Construction.* (1-4).

The principles of design of electric machines with practice in the repair and rewinding of such machines.

Prerequisite: Must be accompanied or preceded by Electrical Engineering 302 or 308.

(Elective in V).

436. *Wiring and Lighting.* (3-0).

(a) A study of the fundamentals of interior wiring.

(b) The principles of artificial illlumination with a study of modern types of illuminants.

(Required in IX, group 2).

438. *Theory of Alternating Currents.* (3-0).

A mathematical treatment of the theory of alternating currents. Use will be made of both calculus and differential equations, and the course will include a study of such differential equations and hyperbolic functions as have greatest application in electrical engineering.

Prerequisite: Electrical Engineering 401.

(Elective in V).

FOR GRADUATES

501, 502. *Advanced Alternating Currents.* (2-4).

The theory of transient phenomena; polyphase circuits; the study of transients with the oscillograph.

Laboratory fee, $2.50 each term.

503. *Electrical Machine Design.* (1-4).

The design of electrical machines and the predetermination of their characteristics.

504. *Electrical Plant Design.* (2-4).

The design of power plants with especial emphasis on the electrical machinery.

505, 506. *General Electrical Engineering.* (3-0).

The application of electrical machinery to various industrial uses; other problems met in the electrical field.

DEPARTMENT OF ENGLISH

Professor Summey, Professors Thomas, Cofer, Associate Professors Gunter, Mayo, Owens, Assistant Professors Page, S. S. Morgan, Spahr, Mr. Key, Mr. Bayne, Mr. Harris, Mr. Hickerson, Mr. Stephenson

103, 104. *Rhetoric and Composition.* (3-0).

Recitations, readings from standard and current literature, and composition both oral and written.

(Required in I, X, XI, XII, XIII, XIV, XV, XVI, XX, XXI, C).

105, 106. *English Composition and Contemporary Civilization.* (4-0).

The same as courses 103 and 104, except for the addition of lectures on Contemporary Civilization, the material of which is used as subject matter for composition.

(Required in all four-year engineering courses and in IX, XIII, XVII, XVIII, XIX).

105a, 106a. *Lectures on Contemporary Civilization.* (1-0).

Lectures on various phases of modern civilization; material of the lectures reviewed and used as subject matter for composition in courses 105, 106.

203, 204. *Advanced Composition.* (2-0).

Expository writing, vocabulary study, reports oral and written, and correspondence, with readings from standard and current literature.

Prerequisite: English 103, 104, or 105, 106.

(Required in all four-year courses except X, XII, XVI, XIX, and in XVIII, XXI).

231, 232. *EnglishLiterature.* (3-0).

A survey of English Literature from Chaucer to the late eighteenth century, with parallel readings and written reports; special attention given to the main currents of English thought as reflected in the literature.

Prerequisite: English 103, 104, or 105, 106.

(Required in X, XII, XVI, XIX).

301. *Argumentation.* (1-0).

A study of the logical and rhetorical essentials of argument, with practice in outlining, writing, discussion, and parliamentary procedure.

Prerequisite: English 203, 204.

(Required in I, XIV, XV, XX).

303. *Argumentation.* (2-0).

Silimar to course 301, except that more time is available for writing and discussion.

Prerequisite: English 203, 204.

~~(Required in I, III, IV, V, VI, VIII, IX, XI, XIV, XV, XVI, XX, XXI).~~

309, 310. *The English Language.* (2-0).

A study of the history, vocabulary, syntax, and sounds of the English language, with a view to better understanding and command of the mother tongue.

Prerequisite: English 231, 232, or 203, 204.

(Elective).

321, 322. *Nineteenth Century Literature.* (3-0).

A study of the intellectual tendencies of the last century in England, as reflected in the poetry, essays, and novels of the period, including the work of Wordsworth, Shelley, Byron, Keats, Tennyson, Browning, Arnold, and Swinburne among the poets, Carlyle and Ruskin among the essayists, and the novels of Scott, Austen, Dickens, Thackeray, Eliot, and Hardy.

Prerequisite: English 231, 232.

(Required in X, XIX; elective in all four-year engineering courses.)

401, 402. *Public Speaking.* (1-0).

Practice in the use of the voice, in public discussion, and in the planning and delivery of speeches for special occasions; conferences with the instructor required.

Prerequisite: English 203, 204, or 231, 232.

(401: Required in all four-year courses except I, group 12, XIII, XVI, and in XXI).

(402: Required in all four-year courses except XIII, XVI, and in XXI).

403, 404. *Public Speaking and Lecturing.* (3-0).

Practice in the use of the voice, in discussion, and in the preparation and delivery of speeches, on a larger scale than is possible in the one-hour courses 401, 402; composition and delivery of speeches on popular scientific and industrial topics; practice in the management of public gatherings; conferences with the instructor required.

Prerequisite: English 203, 204, or 231, 232.

(403: Required in I, group 12, XIII, XVI; elective in all four-year engineering courses).

(404: Required in XIII, XVI; elective in all four-year engineering courses).

413, 414. *Contemporary Literature.* (2-0).

A study of the most significant British and American novelists, poets, and dramatists from about 1890 to the present, with lectures on the social, political, economic, and intellectual background. Among the authors studied are Bernard Shaw, Samuel Butler, John Galsworthy, Rudyard Kipling, H. G. Wells, Sinclair Lewis, Joseph Conrad, Eugene O'Neill, and Edna St. Vincent Millay.

Prerequisite: English 231, 232, or 203, 204.

(Required in X, XIX).

ENTOMOLOGY

Professor Bilsing, Associate Professor Fletcher, Assistant Professor Little.

201. *General Entomology.* (2-2).

The systematic position of the various insects; the relation of the anatomy of insects to control measures; the life histories of the more common insects; methods of control for injurious forms.

Text: Applied Entomology, Fernald.

Laboratory fee, 75 cents.

(Required in I, XI, XVI, XX, XXI; elective in X).

202. *Economic Entomology.* (2-2).

The life histories, habits and control methods of the common injurious insects are considered in this course. The control of insect outbreaks by the use of parasites and entomogenous fungi is considered. Special emphasis is given to insecticides, spraying and dusting machinery.

Text: Pests of Farm, Garden and Orchard, Sanderson and Peairs.

Laboratory fee, 50 cents.

(Required in XII; elective in X).

208. *Animal Parasites.* (2-2).

This course consists of a study of insects and other anthropods which are parasitic upon domestic animals or which are concerned in the transmission of diseases of live stock. Methods of eradication and control are given due emphasis.

Text: Medical and Veterinary Entomology, Herms.

Prerequisite: Entomology 201.

(Required in XI, XXI).

301, 302. *Systematic Entomology.* (2-4).

A thorough, systematic study of the various orders of insects is made in this course. The student has free access to the entomological library, which contains bound volumes of standard publications on entomology, keys, etc. The student also has access to a considerable insect collection for identification purposes.

Text: An Introduction to Entomology, Comstock.

(Elective).

304. *Apiculture (Elementary).* (2-2).

This an elementary course in beekeeping open to all four-year students. The course is arranged so as to give the student a working knowledge of beekeeping which will prepare him for conducting a small apiary in connection with general farm work or for entering commercial beekeeping as a vocation. The course includes a study of the life history of the honey bee, methods of making hives and equipment, and the control of bee diseases. The department is equipped with an apiary, hives, tools, wax presses, automatic extractors, and the standard equipment used in beekeeping.

Text: Productive Beekeeping, Pellet.

Laboratory fee, 50 cents.

(Elective).

307, 308. *Apiculture.* (3-2).

This course is intended for those who wish to make a special study of beekeeping and should be followed by Entomology 408. A study is made of the biology of the honey bee. Working over out-of-date equipment, extracting honey and the preparation of wax are given due attention. Some time is given to studying the various methods of wintering, and swarm control. Special attention is given to the honey plants and the areas most suited to beekeeping.

Text: Beekeeping, Philips.

(Elective).

312. *Medical Entomology.* (3-2).

A study of the life histories, habits, and control methods of insects which are directly concerned in the transmission of human diseases such as yellow fever, malarial fever, typhus fever, bubonic plague, etc.

Text: Medical Entomology, Johannsen and Riley.

Laboratory fee, $1.00.

Prerequisite: Entomology 201.

(Elective in X).

401. *Advanced Economic Entomology.* (2-4).

This course is arranged for students intending to follow entomological work. Particular attention is given to economic problems, methods of entomological research, and field methods of insect investigation and control. This course also embraces insectary methods of breeding insects and studies of insect parasitism.

Prerequisite: Entomology 201.

(Elective).

402. *Advanced Economic Entomology.* (2-4).

A continuation of Entomology 401. In addition to a field and laboratory study of life histories which has been carried on in course 301, the student takes up a detailed study of insecticides. Various types of spraying machinery, dusting machines, and fumigating apparatus are discussed.

(Elective).

403. *Entomological Literature.* (3-2).

The most important works on the classification of insects; publications of various entomologists; a review of the more important bulletins published by the United States Department of Agriculture and the various State Experiment Stations.

(Elective).

405. *Fruit Insects.* (2-2).

A detailed study of the life history, habits and control of the insect pests of fruit and truck crops with special attention to control methods adapted to Texas conditions, and to the value of parasites and orchard management in the control of insect pests.

Text: Fruit Insects, Slugerland and Crosby.

408. *Apiculture, Queen Rearing.* (1-4).

The theory of the various methods of queen rearing; the methods of shipping combless packages of bees; the management of apiaries.

Texts: Practical Queen Rearing, Pellet, Queen Rearing Simplified, Smith.

(Elective).

411 – Cotton Insects (2-2)

FOR GRADUATES

501, 502. *Research Entomology.* (3-4).

A special research problem is assigned to each student taking this course, in which he makes a life history study of some important insect. The student makes a study of all available literature on this subject; and a systematic study of some group of insects, either of the group to which the insect belongs of which he is making a life history study, or of some related group.

Laboratory fee, $2.00 each term.

503, 504. *Cotton Insects.* (2-4).

A detailed study of the life histories of the more important insects affecting cotton, together with a thorough survey of the literature on this subject. The use of cultural methods, dusting and sterlizing machinery and insecticides will be considered.

505, 506. *Advanced Apiculture.* (2-4).

A problem in apiary management or in the study of one or more of the diseases affecting bees; grading and marketing honey, foul brood laws, and methods of eradicating bee diseases.

507, 508. *Economic Entomology.* (2-4).

In this course a detailed study is made of the most important economic pests. A comparison is made of the structure of insects belonging to the same group which attack our more important crops. Cultural methods, trap crops,

insecticides, and fumigation are discussed in connection with these insects.

Laboratory fee, $2.00 each term.

509, 510. *Microtechnique.* (2-4).

In this course a study is made of insect tissues; methods of making microscopic slides, making sections and staining tissues.

511, 512. *Research Entomology.* (2-4).

A study of the distribution of insects and the ecological relationship to their environment.

Prerequisite: Taxonomic work.

FOR STUDENTS IN SHORT COURSES.

22. *Elementary Economic Entomology.* (2-2).

The control of our most common pests; the commoner insecticides; the most common pests of cotton, wheat, oats, corn, fruits, and live stock.

Laboratory fee, 50 cents.

(Required in C).

56. *Elementary Apiculture.* (2-2).

A study of the habits of the honey bee, behavior in swarming and methods of increase; a study of the methods of manipulation, transfer, and swarm control

Laboratory fee, 50 cents.

(Elective in C).

DEPARTMENT OF FORESTRY

Professor Siecke

302. *Farm Forestry.* (2-2).

A study of the life history of trees; the relation of different species to light, moisture, soil, temperature, and the effect of their association on the forest; origin and determination of forest types; the relation of forests to stream flow; description of forests; preparation of forest maps; improvement of young forests; and the proper cutting and use of mature forests so as to secure natural reproduction; silvicultural systems of cutting as practiced in the forests of Europe and the United States; species suitable for shade trees and for planting in shelter-belts, wind-breaks and wood lots; cost of planting; care of shade trees, parks and tree plantations; elementary tree surgery.

Text: Principles of Handling Woodlands, Graves. Lectures and field work.

(Elective).

304. *Principles of Forestry.* (2-0).

History of forestry from the beginning of European practice to its development in this country; general survey of the fundamental principles underlying forestry, including the relation of forests to soil, moisture, light, and climatic conditions; influences of forests upon stream flow; the important systems of treating woodlands practiced in Europe and in the United States; the habits of important economic timber trees and the character and uses of the more im-

portant woods; methods of estimating standing timber and measuring its growth by the use of various forest instruments; effects of forest fires and the study of other important enemies of the forest; a brief treatise on the timber regions of the United States; the amount of standing timber and the consumption of timber; the practice of forestry by the government, particularly on its national forests, and the present status of forestry in the States and among private owners of timber land.

Text: Elements of Forestry, Moon and Brown.
(Elective).

DEPARTMENT OF GENETICS

Professor Humbert, Associate Professor Horlacher

301. *Genetics.* (3-2).

Variation; measurement of variation; heritable differences; inheritance of acquired characters; mendelism; the pure line and selection; factor hypothesis; blending inheritance; carriers of heritage; architecture of germplasm; somatogenesis; determination of sex.

Text; Genetics, Walter.
Prerequisite: Biology 101, 102, 207.
Laboratory fee, $1.00.
(Required in I, groups 4, 5, 7, 9, 11; XI, XII, XXI).

302. *Genetics.* (3-2).

A continuation of course 301.

Texts: Inbreeding and Outbreeding, East and Jones; Genetics and Eugenics, Castle.
Prerequisite: Genetics 301.
Laboratory fee, 50 cents.
(Elective).

304. *Plant Breeding.* (3-2).

Improvement of field, forage and horticultural crops.
Text: Breeding Crop Plants, Hayes and Garber.
Prerequisite: Genetics 301.
Laboratory fee, 50 cents.
(Required in I, groups 4, 9).

306. *Animal Breeding.* (2-2).

Genetics as applied to the problems of the animal breeder; reproduction; fertility; sterility; inbreeding; outbreeding; selection.

Text: Animal Breeding, Winters.
Prerequisite: Genetics 301.
Laboratory fee, 50 cents.
(Required in I, group 5).

308. *Poultry Breeding.* (2-0).

Principles of genetics applied to the problems of the poultry breeder. Fec-

undity, plumage color, sex-linked inheritance, form.
Text: Hereity in Poultry, Punnett.
Prerequisite: Genetics 301.
(Required in I, group 11).

402. *Origin, Classification and Breeding of Cotton.* (2-2).
History and botany of cotton; methods of improvement and study of varieties.
Prerequisite: Genetics 301, 304.

403. *Eugenics.* (2-0).
Variation and heredity applied to human beings.
Text: Applied Eugenics, Popenoe and Johnson.
Prerequisite: Genetics 301, Senior classification.
(To be repeated in the second term).

FOR GRADUATES

501, 502. *Advanced Plant Genetics.* (2-4).
Specialized study of plant genetics. Opportunity to specialize in cotton or some other commercial crop. Standard text books and current scientific literature used.

503, 504. *Advanced Animal Genetics.* (2-4).
Specialized study of animal genetics. Opportunity to specialize on some breed of farm animal or Drosophila. Standard text books and current scientific literature used.

505, 506. *Advanced Biometry.* (2-4).
The application of certain biometric principles to the interpretation of genetic data.

507, 508. *Genetic Studies in Cotton.* (2-4).
This course is designed for graduate students especially interested in cotton and in it a detailed study of the cotton plant is made.

DEPARTMENT OF GEOLOGY

Professor Hance, Associate Professor Burt, Assistant Professor Hall, Mr. Stenzel

201. ~~*Physiography.*~~ General Geology (3-2).
The agents and processes which have produced the surface features of the earth, and their influence upon human affairs. Elements of weather and climate.
Laboratory work consists of a detailed study of topographic maps, minerals and rock types. Some field trips.
Text: Physiography, R. D. Salisbury.
Prerequisite: Chemistry 102.
Laboratory fee, $1.50.
(Required in I, IV, IX, group 2, XV, XX, XXI; elective in V).

202. *Historical Geology.* (3-2).

Hypotheses of the earth's origin. Principles of stratigraphy and paleontology. The physical and organic record of the earth's history.

Laboratory work consists of detailed study of geologic maps and folios. Some field trips.

Text: Textbook of Geology, Part II, Pirsson and Schuchert.

Prerequisite: Geology 201.

Laboratory fee, $2.00.

(Elective).

203. *Mineral Resources of the United States.* (3-0).

A general survey of our mineral resource assets, their diversity, magnitude and national importance.

Text: Lectures and assigned readings.

Prerequisite: Chemistry 101, 102 or the equivalent.

(Elective).

210. *Agricultural Geology.* (2-2).

The common rock-making minerals and rock types. Rock weathering. Relations of soils to bed-rock and physiography.

Text: Rocks, Rock Weathering and Soils, Merrill, or equivalent.

Prerequisite: Geology 201.

Laboratory fee, $1.50.

(Elective in I).

301. *Crystallography and Mineralogy.* (2-4).

An elementary course in crystallography and determinative mineralogy. Occurrence and uses of some of the more common minerals.

Laboratory work includes a study of crystal models, followed by the use of the blowpipe and other methods of rapid mineral identification.

Text: Mineralogy, Crystallography and Blowpipe Ananlysis, Moses and Parsons.

Prerequisite: Chemistry 102.

Laboratory fee, $2.00.

(Elective).

302. *Petrology.* (3-0).

Rocks, their texture, mineral composition and classification. Physical and chemical characteristics. Origin and modes of occurrence.

Laboratory work to include a study of hand specimens for the identification of rock types. Preparation and study of thin sections of rocks under the polarizing microscope.

Text:

Prerequisite: Geology 301.

Laboratory fee, $2.50.

(Elective).

303. *Economic Geology.* (3-0).

A study of the general nature of the application of geology to practical affairs.

Text: Economics Aspects of Geology, Leith, or the equivalent.

Prerequisite: Geology 202, 302.
(Elective).

304. *Ore Deposits.* (3-3).

A study of the principles involved in the formation of ore deposits. Characteristic mineralogic, petrographic and physiographic features of various types of known deposits. Detailed analyses of some of the more typical mineral districts.

Laboratory work on rock and mineral specimens, and the application of the microscope to a study of ore minerals.

Text: Mineral Deposits, Lindgren, or the equivalent.
(Elective).

Laboratory Fee $2.00, Prerequisites 202, 302, 311, 312

311. *Metamorphic Geology.* (2-2).

A critical study of rock metamorphism, both destructive or disintegrating, and constructive or intergrating changes. Development of the theme; adaptation to environment.

Laboratory work to illustrate graphical studies of mineral and rock changes, and microscopic work on thin sections of various rock types.

Text: Metamorphic Geology, Leith and Mead.
Prerequisite: Geology 202, 302.
Laboratory fee, $2.00.
(Elective).

312. *Structural Geology.* (2-0).

The interpretation of rock structures caused by earth movements. The relations of rock structures to stratigraphic, physiographic and economic problems.

Text: Structural Geology, Leith.
Prerequisite: Geology 202; must be preceded or accompanied by Geology 302.
(Elective).

401. *Geology for Engineers.* (2-3).

A consideration of various geological factors which are involved in engineering problems. The relations of soils and rock to underground water supply and drainage, excavation and foundation problems, highway construction, building materials, fuels, etc. The efficient utilization of government maps and other pertinent material of value.

Text: Engineering Geology, Ries and Watson.
Laboratory fee, $1.50.
(Elective in IV).

404. *Geology of Petroleum.* (3-3).

A detailed study of the observed factors involved in the occurrence of oil and gas. Theories as to the origin, migration and accumulation of these hydrocarbons. Detailed studies of certain productive areas. A brief consideration of future problems related to this important mineral resource.

Laboratory work on maps and other graphic methods of study of field problems.

Text: Geology of Petroleum, Emmons.
Prerequisite: Geology 303, Physics 202 or equivalent.
Laboratory fee, $2.00.
(Elective).

DEPARTMENT OF HISTORY

Professor Gammon, Associate Professor Sugareff, Mr. McQuillan

101, 102. *The Development of Western Europe.* (3-0).

A general survey of the political, religious, social and economic development of Western Europe from the decline of the Roman Empire in the West to 1925.

(Required in XIX).

211, 212. *Comparative Government.* (3-0).

An introduction to the nature of political science, followed by a comparative study of the governments of England, France, Germany and Switzerland.

(Elective).

213, 214. *History of England.* (3-0).

Basic course: British, Saxon and Norman origins; national development; struggles between church and state, crown and nobles, nobles and commons; Agrarian and Industrial Revolutions; relations with Ireland; evolution of democracy; growth of the Empire before, during and since the World War.

(Elective).

215, 216. *History of United States.* (3-0).

Basic course: discovery and colonization; colonial governmental, economic and social institutions; the Revolution; adoption of the Constitution; growth of nationalism; cotton and the slavery problem; war for Southern independence; reconstruction; new social and industrial problems; recent international relations.

(Elective).

305. *Citizenship.* (3-0).

The nature, organization and functions of the federal system; the rights privileges and obligations of citizenship; immigration; naturalization; law enforcement; party politics and public opinion. Seeks to give the student an adequate knowledge of his national government and to enable him to function worthily as a citizen.

(Required in all four year engineering courses and in I, group 12, XIII, XVI, XVIII; elective in XII).

307, 308. *Industrial History of England and United States.* (3-0).

Trace industrial growth of England, emphasizing agricultural changes, the evolution of trade and town life; the transition to modern industrial conditions produced by the Industrial Revolution. In second term: economic expansion of United States including growth of its industries and commerce, rise of labor and capital organizations, the tariff and banking.

(Elective).

311, 312. *Modern and Contemporary Europe.* (3-0).

Basic course: French Revolution; Napoleon; Restoration; Industrial Revolution; Revolutions of 1830 and 1848; struggle for democratic government; new nationalism; expansion and imperialism; alliances and ententes; causes and results of World War.

(Elective).

341, 342. *Beginnings of Modern Europe.* (3-0).

The sources of the Renaissance; its development in Italy; its extension into northern and western Europe; its political, intellectual and artistic aspects. The reformation: causes, growth and doctrinal phases; the spread of the movement; the Counter-Reformation; the Thirty Years' War.

Prerequisite: History 101, 102.

(Elective).

411, 412. *Outline of History.* (3-0).

A general survey of the history of Western Civilization, based upon a text, lectures and outside reading. The lectures are given by several members of the teaching staff, each dealing with that phase of history of which he has special knowledge.

(Required in I, group 12; elective only for seniors in other four-year courses who have had no previous college course in History).

421,422. *Contemporary United States.* (3-0).

A course in American History since the Civil War for seniors. The political, economic and social development of the United States; the nation's territorial advance into the Caribbean area; its participation in world politics; its diplomatic relations with other American republics constitute the central topics.

(Elective for all seniors who have had one college course in History).

In order to obtain credit for either term, the work of both terms of the course must be completed.

DEPARTMENT OF HORTICULTURE

Professor Kyle, Professor Hensel, Associate Professors Adriance, Lyle, and Mr. Jamison.

201. *Plant Propagation and Orcharding.* (2-2).

Lectures and recitations on the fundamental principles and methods of plant propagation, including vegetables, fruits, and ornamentals; methods of planting and managing the home orchard.

Practice: Propagation of plants from seed and bud; planning, planting, pruning, spraying, and general care of the home orchard.

Text: Plant Propagation, Kains, Lectures.

Prerequisite: Biology 101, 102.

Laboratory fee, 75 cents.

(Required in I, XII, XVI, XX, XXI).

202. *Vegetable Gardening.* (2-2).

Planning, planting, equipping and operating vegetable gardens, with special reference to the needs of the home; also canning and storage of vegetable crops for home use.

Text: Garden Farming, Corbett. Lectures and reference work.

Practice in planning, planting and cultivating a small garden, equipping, fertilizing, spraying, harvesting, erection of hot-beds and cold frames.

Laboratory fee, 75, cents.

(Required in XV; elective in XII).

208. *Ornamentals.* (2-2).

A study of the ornamentals adapted to Southern conditions.
Lectures and recitations.
Practice: The propagation, classification and landscape arrangement of ornamentals.
Prerequisite: Horticulture 201.
Laboratory fee, $1.00.
(Required in XX).

303. *Principles of Fruit Production.* (3-2).

Orchard management, including problems of location, soils, planting, cultivating, protection from insects and diseases, pruning, harvesting and marketing.
Practice: Practical orchard work from planting to marketing.
Text: Book of Pomology, Gourly. Lectures and recitations.
Prerequisite: Horticulture 201.
Laboratory fee, $1.00.
(Required in I, group 9, XX).

304. *Nut Culture.* (1-4).

Early history; distribution of native nuts; development of native groves to improved varieties.
Text: Pecan Growing. Stuckey and Kyle.
Lectures and recitations.
Practice: Budding and grafting pecans in the nursery row; top-working native pecans to improved varieties by means of the patch, chip and crown bud and by grafting. A native systematic study is made of the standard varieties of nuts.
Prerequisite: Horticulture 201.
of pecans, development of orchards planted to improved varieties of pecans, methods of propagation, especially as applied to top-working native seedlings
Laboratory fee, $1.50.
(Elective).

307. *Introduction to Landscape Art.* (2-4).

A course designed both for students specializing in landscape design and for those wishing a general course, sufficiently comprehensive to enable them properly to plan small home and school grounds.
The drawing of plans for small home grounds; school grounds and other public and semi-public properties.
(Required in I, group 10, XX).

308. *History of Landscape Art.* (2-0).

A comprehensive study of the development of landscape design.
Illustrated lectures and recitations.
Text: To be assigned.
(Required in I, group 10, XX).

310. *Commercial Vegetable Production.* (2-2).

The production of vegetables for market. Consideration is given climate, soil, equipment and storage, as affecting production and marketing in Texas and

other states.

Lectures and recitations.

Practice: The production, harvesting and marketing of vegetable crops.

Prerequisite: Horticulture 202.

Laboratory fee, $1.50.

(Required in I, group 9; XX).

314. *Floriculture.* (2-2).

A course designed to give a working knowledge of the culture and use of the annuals, perennials, and bulbous plants especially adapted to our climatic conditions.

Text: To be assigned. Lectures.

Practice: The growing, transplanting and care of the commoner annuals and perennials.

Lectures and recitations.

Prerequisite: Horticulture 201.

Laboratory fee, $1.00.

(Required in XX).

316. *Landscape Design.* (0-8).

A continuation of the study of elementary landscape design. The making of sketches, planting plans, and plans of arrangement of increasing difficulty.

Library Assignments.

Prerequisite: Horticulture 307.

(Required in XX).

401. *Systematic Pomology.* (3-2).

A technical course covering deciduous fruits, their identification. classification, distribution, importance, and history, and a detailed study of the more important species and varieties.

Practice is given with such fruits as can be obtained during the season.

Laboratory fee, $2.50.

Prerequisite: Horticulture 303.

(Required in I, group 9).

415, 416. *Landscape Design.* (3-8).

The principles underlying landscape art, the solution of the various landscape problems; assignments; reports.

Lectures and recitations.

Text: Landscape Architecture, Hubbard and Kimball.

Prerequisite: Horticulture 307, or its equivalent.

(Required in I, group 10, XX).

419, 420. *Experimental Horticulture.* (1-0, 0-4).

Research methods in the planning and execution of horticultural projects. The student is expected to become thoroughly familiar with all phases of his problem and to carry same to satisfactory conclusion. Project statement to be submitted by December 15. Project reports due week preceding Commencement.

Lectures and assignments.

Laboratory fee, $2.00 second term.

(Required in XX).

421. *Commercial Horticulture.* (2-2).

A study of the methods of harvesting, grading, packing, shipping, storage and selling of fruits and vegetables.

Lectures and recitations.

Prerequisite: Horticulture 202, 303.

Laboratory fee, $2.00.

(Required in I, group 9).

422. *Subtropical Fruits.* (3-2).

A study of subtropical fruits, with special attention to citrus fruits, figs, olives, dates.

Lectures and recitations.

Practice: A comprehensive collection of the various subtropical fruits is available for practice. Orchard heating is given attention.

Laboratory fee, $2.50.

(Elective).

424. *Commercial Fruit Production.* (2-4).

A study of the more specialized features of fruit production, such as fruit setting and thinning, summer pruning, spring and summer cultivation and orchard practice, application of fertilizers, and spraying to control some of the common insects and diseases.

Practice: Field work in pruning, spraying, applying fertilizers, harvesting grading and packing fruit.

Text: To be assigned.

Lectures and recitations.

Prerequisite: Horticulture 303.

Laboratory fee, $1.00.

(Required in I, group 9).

FOR GRADUATES

501, 502. *Advanced Fruit Growing.* (2-4).

An advanced course in fruit production. Special attention is given to the problems of cultivation, fertilization, pruning, thinning of fruit and protection from frost and insect pests and diseases; the improvement of fruit by means of bud selection and breeding.

Prerequisite: Horticulture 303, 401, or equivalent work.

503, 504. *Advanced Vegetable Gardening.* (2-4).

The latest methods used in the production of vegetables for market and truck gardening purposes; irrigation; forcing plants for early market, and the development of plants by breeding and selection.

Prerequisite: Biology 101, 102; Horticulture 202, 301, 404, 420, or equivalent work.

505, 506. *Advanced Landscape Art.* (2-12).

Advanced landscape design, including the gathering of data, making of preliminary reports, detailed working plan, specifications, including nursery list of prices, and a finished water color rendering of the problem assigned.

Prerequisite: Civil Engineering 319; Drawing 316; Horticulture 407, 415, 416, or equivalent work.

507, 508. Research (1-6)

DEPARTMENT OF INDUSTRIAL EDUCATION

Professor E. L. Williams

Note.—The courses in this department are offered in residence during the summer session only.

102. *Theory and Principles of Vocational Education.* (2-0).

Its fundamentals: A brief history of the principles of education leading up to the needs for vocational education. A review of the Federal and State laws pertaining to schools. The relation of the general education ,manual training and industrial arts to vocational education. Attention is given to the problems of organization and administration of various types of vocational schools.

(Required in XIII).

202. *Job Analysis.* (2-0).

Several particular jobs of the various trades will be analyzed, listing all the necessary tools, operations and related information connected with that job. This course is designed to help teachers to plan and route jobs through their shops making sure that none of the important instructional material is omitted.

(Required in XIII).

203. *Trade Analysis.* (2-0).

The student must know a trade; it will be divided into its several parts as: units, operations, jobs, science and mathematical content, etc. The material will then be organized into teachable form.

Prerequisite: At least two years of trade experience.

(Required in XIII).

301. *Methods of Teaching and Class Management.* (2-0).

Most effective organization of equipment and economic ways of securing materials as teaching aids, planning of daily programs; discipline and individual adjustment; grading, records and reports.

(Required in XIII).

307. *Psychology of Adolescence.* (3-0).

A psychological study of the youth and his development and recreation to modern methods of education and industry.

(Required in XIII).

308. *A Study of Modern Industries.* (3-0).

The political, historical and geographical factors which have a direct influence upon the development and distribution of industries. Specific studies of individual industries will be made, such as: iron and steel, paper, automobiles, petroleum, cement, leather, textiles, etc. Essestial features of these industries are considered: location, machinery, power, raw materials, markets, labor, etc.

(Required in XIII).

310. *Course Making.* (2-0).

A course designed especially for teachers who desire to study the basis of selecting subjects for industrial courses and methods of outlining courses of study to meet the various needs of the different types of classes. Each student will make a complete course for some particular subject he is teaching or interested in.

(Required in XIII).

312. *Psychology Applied to Industry.* (3-0).

A direct application of the fundamental principles of psychology to industry. The relation of the worker's nervous system to his mind, the cultivation of right habits in workers; instincts, imitation, memory, and imagination; interest factors and power of suggestions aids in increasing the quantity and quality of production; "association of ideas" as an aid in giving orders; development of initiative, reasoning and judgment in workers, psychology as an aid in reducing turnover.

(Required in XIII).

314. *Observation and Criticism.* (1-2).

Opportunity for observation of industrial teaching will be provided, There will be assigned observations given the members of this class in the various factors that should be taken into account, as, equipment, safety, records, discipline, methods of instruction and the handling of stock. These assignments and written reports will be turned in and followed by discussions and conferences.

(Required in XIII).

318. *Methods of Teaching Related Sujects.* (2-0).

A course designed especially for those teaching or preparing to teach the related work in trade and industrial schools. It will cover such topics as related matter in the shop and the cooperation of class room and shop in related work.

320. *Aims and Objectives of Part-Time Schools.* (2-0).

Part-time laws; organization and administration of classes to meet the needs of junior workers; trade preparatory, trade extension, and general continuation classes under compulsory and elective system.

322. *Occupational Analysis and Organization of Instructional Material.* (2-0).

Analysis of occupations and the organization of the teachable content.

323 Practice Course (0-6)

406. *Vocational Guidance.* (2-0).

A survey of the recent development of education and vocational guidance within and outside of the schools, information on the common occupations and their requirements, an analysis of personal characteristics; try-out methods; value of cumulative school records; methods of keeping records; optional guidance through literature; needs for follow up work in vocational counselling; a study of the psychological, industrial and commercial tests.

(Required in XIII).

407. *Special Methods of Teaching Industrial Subjects.* (2-0).

A course to emphasize the importance of using charts, models, advertising material, catalogues, sketches, blackboard illustrations, etc., in teaching industrial subjects.

(Required in XIII).

408. *Educational and Achievement Measurements.* (3-0).

This course aims to help the teacher make up and use tests and rating sheets, gather data, diagnose problems and use this material for better promotion of his work.

409. *Methods of Introducing Industrial Organization and Management into Industrial Schools.* (2-0).

A study of the history and development of industrial organizations and managements up to the present most efficient methods and how these systems can best be adopted in industrial schools to make them more practical.

(Required in XIII).

411, 412. *Lesson Planning and Practice Teaching.* (1-4).

The emphasis is upon methods of presentation. Some of the topics taken up are: the lesson, its purpose and aim; the steps in lesson presentation; testing the effectiveness of instruction.

In this course each student will be required to apply the principles taken up to specific lessons in the course he is teaching; such as shop subjects; related drawing; related mathematics; related science.

(Required in XIII).

413. *Science Related to Trades.* (3-0).

Study of the sciences of the production of materials used in industries, as: producing, drying and manufacturing of lumber products, and the making, heating and treating of steel.

414. *Methods of Training Foremen and Workers in Industrial Plants.* (3-0).

The aims of the course are to help teachers, supervisors and directors organize material and make out course outlines for training foremen and workers in the plants.

420. *Follow-up, Visitation, and Coordination in Part-Time Schools.* (2-0).

Coordination between instruction given to the junior employee and the job, and the procedure in follow-up and promotional advancement.

422. *Social, Economic and Educational Influences Affecting the Junior Worker.* (2-0).

A study of the supply and demand of workers in various occupations; pay and opportunities for advancement and their relation to society as a whole.

FOR GRADUATES

505. *Philosophy of Industrial Education.* (4-0).

The social, economic, and political necessities back of the movement for industrial education; the relating of industrial education to general education; types of courses to meet the demands of the community; the relations of industrial education to capital, labor, Americanization, and world competition in industry.

506. *Basic Principles of Teaching.* (4-0).

The fundamental psychological principles, underlying the teaching processes, applied especially to industrial education.

507, 508. *Organization and Management in Industrial Education.* (4-0).

Problems in organizing and managing industrial schools and departments; making surveys; arranging courses; planning and purchasing of equipment and supplies; selecting instructors; making up efficient forms and records; types of shop jobs; placement of students; cooperation with employers.

EXTENSION COURSES

Under the Federal Vocational Education Act, the College offers extension courses in Industrial Education in centers where a sufficient number of persons are interested in one subject to make such an arrangement possible. The time devoted to each course is thirty clock hours.

These extension courses are planned to meet the requirements of the State Board for Vocational Education for certification of teachers of all types of trades and industrial work. Students taking these courses must meet the qualifications set up by the State Board for Vocational Education.

A student completing satisfactorily any of these courses will be given College credit if he should later register as a resident student. Extension courses are offered at the present time in Galveston and Houston. Applications from other centers will be considered.

The list of extension courses now includes the following:

FOR SHOP AND RELATED SUBJECTS TEACHERS

102. *Theory and Principles of Vocational Education.*
202. *Job Analysis.*
203. *Trade Analysis.*
301. *Metehods of Teaching and Class Management.*
310. *Course Making.*
314. *Observation and Criticism.*
406. *Vocational Guidance.*
411. *Lesson Planning and Practice Teaching.*

FOR PART-TIME GENERAL EDUCATION TEACHERS

301. Methods of Teaching and Class Management.
307. *Psychology of Adolescence.*
314. *Observation and Criticism.*
320. *Aims and Objectives of Part-Time Schools.*
322. *Occupational Analysis and Organization of Instructional Material.*
412. *Lesson Planning and Practice Teaching.*
420. *Follow-up, Visitation, and Coordination in Part-Time Schools.*
422. *Social, Economic and Educational Influences Affecting the Junior Worker.*

DEPARTMENT OF MATHEMATICS

Professor Puryear, Professors R. F. Smith, J. W. Mitchell, Halperin, Associate Professors D. C. Jones, Porter, Assistant Professors Cox, Martin, Binney, Nelson, Mr. McCurry, Mr. Ayres, Mr. Blumberg, Mr. Stevens, Mr. McKee.

101, 102. *Algebra.* (3-0).

A rapid review of elementary topics, followed by the study of quadratic equations, the binomial theorem, variation, the progressions, complex numbers; elementary theory of equations, logarithms, limits, undetermined co-efficients.

Review of certain topics of preceding courses.

Text: College Algebra, Hart. Supplementary exercises.

(Required in all four-year engineering courses and in IX, XIV, XV, XVIII; course 101 in X, XIII, XVII, XIX).

103. *Plane Trigonometry.* (3-0).

Measurement of angles, review of logarithms, solution of right triangles, problems of heights and distances, properties of triangles, solution of oblique triangles, geometrical applications.

Text: Plane and Spherical Trigonometry, Taylor and Puryear.

(Required in all four-year engineering courses; in IX, X, XIII, XV, XVII; elective in XIV, XIX).

104. *Analytics.* (3-0).

The straight line, transformation of co-ordinates, circle, ellipse, parabola, hyperbola, graphs of trigonometric, logarithmic and exponental functions.

Review of certain topics of preceding courses.

Text: Analytic Geometry, Ford. Supplementary exercises.

Prerequisite: Mathematics 101, 103.

(Required in all four-year engineering courses and in IX, XV; elective in X, XIV, XIX).

108. *Agricultural.* (3-0).

Elementary principles of arithmetic, algebra, geometry, with special reference to the needs of agricultural students.

Text: Mathematics for Students of Agriculture, Rasor.

(Required in I, XII, XVI, XX, XXI).

118. *Solid Geometry.* (3-0).

Definitions, lines and planes in space, dihedral angles, polyhedral angles, polyhedrons, the cylinder, cone and sphere.

Text: Solid Geometry, Wentworth-Smith.

(Required as an extra study of freshmen in the School of Engineering who do not present solid geometry for admission).

203, 204. *Calculus.* (5-0).

Differentiation, limits, infinitesimals, integration, maxima and minima, areas, volumes, water pressure, work, introduction to solid geometry, moment of inertia, center of gravity, radius of curvature, Taylor's theorem, elementary examples of differential equations.

Review of certain topics of preceding courses.

Text: Calculus, Woods and Bailey. Supplementary exercises.

Prerequisite: Mathematics 104.

(Required in III, IV, V, VIII, IX, group 2, XV; elective in XIV; course 203 elective in VI).

207, 208. *Mathematical Theory of Investment.* (3-0).

Review of progressions, limits, series, logarithms; graphs, interest, annuities, amortization, bonds, sinking funds and depreciation, probability, life insurance.

Text: The Mathematics of Investment, Hart.

Prerequisite: Mathematics 102.

(Elective in XIV).

301, 302. *Mathematical Analysis of Statistics.* (3-0).

Frequency distributions, averages, measures of dispersion, interpolation, summation, graduation, curve fitting, random sampling, frequency curves, correlation, index numbers.

Text: Mathematical Analysis of Statistics, Forsyth.

Prerequisite: Mathematics 101, 102.

(Elective in XIV).

FOR GRADUATES

501. *Advanced Calculus.* (3-0).

502. *Differential Equations.* (3-0).

DEPARTMENT OF MECHANICAL ENGINEERING

Professor Fermier, Professor Flagg, Associate Professors Peterson, Brewer, Crawford, Assistant Professor Fern, Mr. Chappelle, Mr. Downard, Mr. Kunz, Mr. Laursen, Mr. McCarter, Mr. Westerhoff, Mr. Olsen.

103. *Woodwork.* (0-3).

Shop practice in the use of the common bench tools and power machinery for working in wood, as applied to joinery, elements of construction, and cabinet making. Practice in the use of shop records, systems, etc., is also given. Special work is provided for those who have had manual training before entering.

Laboratory fee, $1.50.

(Required in III, IV, V, VI, VII).

104. *Forging.* (0-3).

Shop practice in the use of blacksmith and general forge tools in the working of iron and steel; tempering, annealing, welding, case-hardening, etc.

Laboratory fee, $1.50.

(Required in III, IV, V, VI, VIII, XVII).

NOTE.—Courses 103 and 104 together constitute a year's work, three hours a week. Students taking this work will be divided into two groups at the beginning of the first term; one group will begin with course 103 and the other with

course 104. At the beginning of the second term the groups will each change to the other work.

201. *Pattern Making and Foundry Work.* (0-3).

Shop practice in pattern making, molding, and casting in iron and in non ferrous metals.

Laboratory fee, $2.00.

Prerequisite: Mechanical Engineering 103.

(Required in III, V).

See note after course 214.

202. *Pattern Making and Foundry Work.* (0-3).

A continuation of course 201, including advanced methods of foundry production.

Laboratory fee, $1.50.

(Required in III).

205. *Elementary Steam Engineering.* (2-0).

This course aims to give the student such a knowledge of steam power plant equipment as will enable him to understand the operation of the same, and serve as a foundation for subsequent study and calculation along these lines. Valve gears, valve diagrams, and indicator practice are also included.

Text: Elementary Steam Power Engineering, MacNaughton.

Prerequisite: Mathematics 103.

(Required in IV, VI, IX, group 2, XVII).

207. *Kinematics.* (2-2).

Without taking account of the strength of the structure, this course takes up the study of motion, velocity ratios, comparative forces, etc., in machines and their elemental parts, cams, linkages, etc.

Text: Mechanism, Keown.

Prerequisite: Mathematics 104.

(Required in III, V, XVII).

208. *Kinematics.* (2-2).

The same as course 207 with specially chosen problems.

(Required in VI).

212. *Engineering Mechanics.* (3-0).

A study of pure mechanics as the foundation principles involved in the analytical solution of problems concerning the statics of a material point and of a rigid body; with numerous numerical examples from practical engineering problems.

Must be preceded or accompanied by Mathematics 204.

Prerequisite: Mathematics 203.

(Required in III).

214. *Machine Shop Practice.* (0-3).

A modification of course 309, 310.

Laboratory fee, $1.50.

(Required in V, XVII).

NOTE.—For sophomore electrical engineering students, courses 201 and 214 constitute a year's work in the shops. These students will be divided into two groups at the beginning of the first term. One group will begin with course 201, the other with course 214. At the beginning of the second term the groups will each change to the other work.

302. *Steam Engines and Boilers.* (4-0).

A study of fuels; combustion; the generation of steam; the construction, operation, care, design and testing of boilers of various types, together with the design of chimneys and other means of producing draft. Also a study of the basic thermodynamics of heat engines, the mechanics, construction, design, operation and testing of the steam engine, the steam turbine and the oil engine.

Text: Heat Engines, Allen and Bursley.

Prerequisite: Mathematics 204, Chemistry 102, Physics 204.

(Required in V, VIII).

303, 304. *Machine Design.* (0-3, 0-4).

Practice in the design of machine elements, and their proper representation by finished shop drawings.

Text: No text is required, but each student is required to have a Mark's Handbook, or an approved substitute.

Prerequisite: Mathematics 204, Mechanical Engineering 212; must also be preceded or accompanied by Civil Engineering 305 and Mechanical Engineering 313.

(Required in III).

309. *Machine Shop.* (0-3).

Practice in bench and machine tool work in metals. This includes chipping, scraping, filing, babbiting, pipe fitting, drilling, turning, boring, grinding, milling machine work, etc.

Prerequisite: Mechanical Engineering 104.

Laboratory fee, $1.50.

(Required in III, VI, XV).

310. *Machine Shop.* (0-3).

A continuation of course 309, including also tool making and heat treatment of steel; with application of factory production methods.

Laboratory fee, $1.50.

(Required in III),

311. *Carpentry and Cabinet Making.* (0-3).

Practice in cabinet making, including wood seasoning, accurate construction in hardwood, wood finishing, and a limited amount of designing of simple cabinets.

Laboratory fee, $2.00.

Prerequisite: Mechanical Engineering 103.

313, 314. *Engineering Mechanics.* (3-0).

A continuation of course 212, including also dynamics of rotation, work, energy, friction, impact, etc.

(Required in III).

317, 318. *Engineering Mechanics.* (3-0,2-0).
A modification of courses 212, 313, 314, with the same prerequisites.
(Required in V).

319. *Engines and Boilers.* (4-0).
A modification of course 302, with the same prerequisites and text.
(Required in III, VIII).

320. *Thermodynamics.* (4-0).
A study of the effects of heat on gases, and the application of thermodynamic laws and principles to the steam engine, gas engine, hot-air engine, injectors, calorimeters, air compressors, etc., together with a study of heat efficencies of these machines and instruments.
Text: Thermodynamics Abridged, Ennis.
Prerequisite: Mechanical Engineering 319.
(Required in III, VIII).

403, 404. *Engineering Laboratory.* (0-4).
Instruction and practice in testing gauges, indicators, fans, pumps, boilers, engines, etc.; also a study of the actual mechanical operation of various machines.
In addition to the work with the apparatus, the student is expected to make calculations and written reports on the investigations and the results obtained.
Laboraory fee, $1.00 each term.
Prerequisite: Mechanical Engineering 319, 320.
(Required in III, VIII).

407. *Mechanical Refrigeration.* (2-0).
The application of the principles of thermodynamics to mechanical refrigeration. Also a study of different kinds of equipment and methods of practical production or refrigeration and ice making.
Text: Elements of Refrigeration, Greene.
Prerequisite: Mechanical Engineering 320.
(Required in III, group 1).

410. *Gas Engines.* (3-0).
The application of the principles of thermodynamics to the design of gas engines. Also a study of the different cycles, methods of governing, and some details of design construction, operation and care of various types of gas engines and other internal combustion motors.
Text: Internal Combustion Engines, Streeter.
Prerequisite: Mechanical Engineering 320.
(Required in III).

412. *History and Biography.* (3-0).
A study of the lives of men who have been contributors to engineering development. Also a study of the history of the development of appliances and inventions in mechanical engineering.
Lectures and reference reading are the sources of material for this course, for which no text-book is required.
Prerequisite: Graduation candidacy.
(Required in III).

414. *Steam Turbines.* (2-0).

A study of the types and designs of steam turbines, their efficiencies and their operation.

Text: Steam Turbines, Moyer.

Prerequisite: Mechanical Engineering 320.

(Required in III, group 1).

415, 416. *Engineering Laboratory.* (0-3).

A modification of course 403, 404.

Laboratory fee, $1.00 each term.

(Required in V).

417, 418. *Power Plants and Equipment.* (2-4).

A study of the design of power plants, and their equipment is taken up in this course. Choice and arrangement of equipment are studied from the standpoint of economy of material and labor, as well as from the standpoint of general efficiency.

Text: Engineering of Power Plants, Fernald and Orrok.

Prerequisite: Mechanical Engineering 320.

(Required in III, group 1).

419, 420. *Industrial Engineering.* (3-2).

A study of the industrial plath, including building and equipment; from the standpoint of health of workers as well as from the standpoint of suitability for the industrial processes involved.

Lectures and collateral reading are the chief sources in this course. Practice will include reports, also detailed sketches and drawings covering problems with definitely chosen conditions.

Prerequisite: Senior classification. This course must be taken concurrently with 421, 422.

(Required in III, group 2).

421, 422. *Methods and Management.* (2-0).

A study of the general principles of shop management and shop methods as used in plants and factories whose output is largely the product of machine tools and similar equipment.

Prerequisite: Must be taken concurrently with 419, 420.

(Required in III, group 2).

423, 424. *Transportation.* (2-0).

A study of general means of transportation from the standpoint of commerce as well as the conveying of materials in industrial plants and in construction work.

Lectures and collateral reading are the sources of most of the subject matter for this course.

Prerequisite: Senior classification.

(Required in III, group 3).

425, 426. *Railway Mechanical Engineering.* (2-4).

A study of types and the design of railway rolling stock and a study of locomotive performance.

Prerequisite: Mechanical Engineering 319.

(Required in III, group 3).

FOR GRADUATES

501 ,502. *Advanced Machine Design.* (2-6).

The design of machines from the standpoint of kinematics, as well as stresses, the latter covering both the static and the dynamic machine. The practice may be planned to meet the special needs of the individual student.

503, 504. *Power Plants.* (2-6).

An advanced course in the design of central and isolated power plants with special attention to overall economical operation.

505, 506. *Analytic Mechanics.* (3-0).

An advanced course in statics and dynamics, with special emphasis on the latter.

507, 508. *Experimental Engineering Research.* (1-8).

Methods and practice in Mechanical Engineering research, taking up extended problems specially chosen to meet the needs of the individual student.

DEPARTMENT OF MILITARY SCIENCE AND TACTICS

Professor: Lieutenant Colonel Turner. Professors: Major Bertram, Major Coughlan, Captain Buchly, Captain Guidera, First Lieutenant Mickelson, Assistant Professors: Captain Limbocker, Captain Aldridge, Captain Besse, Captain Montgomery, Captain Cheshire, Captain Ware, First Lieutenant Powell.

INFANTRY UNIT

Professor: Edward H. Bertram, Major, Infantry.
Assistant Professor: Edwin E. Aldridge, Captain, Infantry.
Assistant Professor: Lloyd R. Besse, Captain, Infantry.
Assistant Professor: Ralph L. Ware, Captain, Infantry.

101. (1-2).

(a) Theoretical: Military organization; military courtesy and discipline; rifle marksmanship.

(b) Practical: Infantry drill; care of equipment; physical training.

102. (1-2).

(a) Theoretical: Infantry drill.

(b) Practical: Physical training; infantry drill; guard duty; preliminary target practice; gallery practice; rifle practice; military ceremonies; scouting; patrolling.

201. (1-2).

(a) Theoretical: Hygiene; sanitation; first aid; military sketching and map reading.

(b) Practical: Automatic rifle; command and leadership as corporals; musketry.

202. (1-2).

(a) Theoretical: Military sketching and map reading.

(b) Practical: Military sketching; range practice; maneuvers; command; and leadership as corporals; grenades; bayonet; musketry.

301. (3-2).

(a) Theoretical: Machine guns; field engineering.

(b) Practical: Command and leadership as sergeants, field engineering; machine gunnery; one pounder; light mortar.

302. (3-2).

(a) Theoretical: Military law; field engineering continued.

(b) Practical: Command and leadership as sergeants; field engineering; one-pound gun; trench mortar.

401. (3-2).

(a) Theortical: Minor tactics.

(b) Practical: Command and leadership as officers and instructors; pistol.

402. (3-2).

(a) Theoretical: Minor tactics; military history and policy; military administration.

(b) Practical: Command and leadership as officers and instructors; pistol.

CAVALRY UNIT

Professor: Walter E. Buchly, Captain Cavalry.
Assistant Professor: Thomas F. Limbocker, Captain Cavalry.
Assistant Professor: Henry H. Cheshire, Captain, Cavalry.

107. (1-2).

(a) Theoretical: Organization and administration; military courtesy and customs; cavalry drill regulations to include the school of the troop; interior guard duty; care of animals and equipment.

(b) Practical: Organization of a unit; instruction in guard duty; cavalry drill to include school of the troop; equitation; care of animals and equipment; physical training.

108. (1-2).

(a) Theoretical: Cavalry drill regulations to include school of the troop; ceremonies and inspections; cavalry weapons, saber, rifle; the cavalry pack; minor tactics; patrols; messages and reports; preliminary range instruction.

(b) Practical: Cavalry drill to include the school of the troop; ceremonies and inspections; preliminary range instruction; gallery practice; range practice; saber exercise, patroling, mounted and dismounted; message carrying and reports; equitation and jumping; physical training, mounted gymnastics.

207. (1-2).

(a) Theoretical: Map reading and military sketching; cavalry drill, close and extended order, including school of the troop; ceremonies and inspections; cavalry combat; development and employment of cavalry; march discipline and routine; military hygiene; first aid.

(b) Practical: Instructors in 107 (b), 108 (b); problems in map reading; sketching; road sketch; position sketch; physical training; cavalry drill to include school of the troop; equitation and jumping; ceremonies and inspections; cavalry combat (troop); practice marches.

208. (1-2).

(a) Theoretical: The cavalry pack, dismounted; cavalry weapons, pistol, automatic rifle; cavalry drill to include school of the troop; equitation and jumping; musketry.

(b) Practical: Instructors in 107 (b), 108 (b); cavalry drill to include school of the troop; ceremonies and inspections; cavalry combat; equitation and jumping; practice marches; cavalry pack, mounted; preliminary instruction in marksmanship, gallery and range practice; the automatic rifle and machine guns; minor tactics, tactical walks, tactical exercises, physical training.

307. (3-2).

(a) Theoretical: Park riding; cavalry drill to include school of the regiment; cavalry combat, squadron and higher units; light artillery, equitation and jumping; ceremonies and inspection; machine gun; care and selection of animals.

(b) Practical: Instructors in 107 (b), 108 (b), 207 (b), 208 (b); cavalry to include the school of the troop; cavalry combat; tactical exercises; tactical ride; ceremonies and inspections; equitation and jumping.

308. (3-2).

(a) Theoretical: Hippology; selection and care of animals; horseshoeing; cavalry drill to include the school of the troop; cavalry combat; tactical rides and exercise; equitation and jumping; military law; rules of land warfare.

(b) Practical Instructors in 107 (b), 108 (b), 207 (b), 208 (b); practical packing; selection and care of animals; horseshoeing; cavalry drill to include school of the troop; cavalry combat; tactical rides and exercises; equitation and jumping; military law; moot court.

407. (3-2).

(a) Theoretical: Military history and policy of the United States; cavalry drill, including school of the regiment; equitation and jumping; ceremonies and inspections.

(b) Practical: Instructors in 107 (b), 108 (b), 207 (b), 208 (b); cavalry drill to include school of the troop; cavalry combat; tactical walks and exercises; park riding; practical packing; ceremonies and inspections.

408. (3-2).

(a) Theoretical: Minor tactics; field service regulations; map maneuvers, relief maps, sand table problems; administration; packing and transportation; cavalry drill, including school of the regiment; field exercises; advanced equitation.

(b) Practical: Instructors in 107 (b), 108 (b), 207(b), 208 (b); leaders in tactical exercises; tactical leaders; participation in tactical exercises as leaders; cavalry combat; ceremonies and inspections; cavalry drill to include school of the troop; advanced equitation; practical packing.

FIELD ARTILLERY UNIT:

Professor: Joseph D. Coughlan, Major, Field Artillery.
Assistant Professor: Murray M. Montgomery, Captain, Field Artillery.
Assistant Professor: Russell D. Powell, First Lieutenant, Field Artillery.

103. (1-2).

(a) Theoretical: Fundamentals of military science. Organization and administration. Military hygiene, first aid, and sanitation. Military courtesy and discipline. Customs of the service. Military leadership and morale. Field artillery drill regulations to include school of firing battery. The elements of field artillery gunnery; definitions, the military elements of the trajectory and the calculation, determination of firing data and its use by cannoneers, duties of the cannoneer.

(b) Practical: School of the soldier, squad and battery, dismounted, standing gun drill, gunner's instruction, firing battery, interior guard duty, manual of the pistol, physical training, ceremonies.

104. (1-2).

(a) Theoretical: Field artillery material—guns, types, construction, mechanical principles, principles of design. Field artillery carriages, design, construction, tools, accessories, equipment, methods of carrying same; dissembling and assembling various parts of gun, lubrication, cleaning, sights, quadrants, fuse setters, fire control instruments, care; ammunition: powders, explosives, detonators, primers, projectiles, fuses; description, care and use.

(b) Practical: Standing gun drill, gunner's instruction, firing battery, machine guns, use and care of individual equipment, physical training, ceremonies, gunner's examination.

203. (1-2).

(a) Theoretical: Stable management: Hippology, equitation, draft.

(b) Practical: Equitation, the soldier mounted. Care of horses and equipment. Adjustment of harness.

204. (1-2).

Theoretical: Draft, the battery mounted. Gas engines. Map reading and topography.

Practical: Draft, the battery mounted. Military sketching. Operation and care of artillery trucks and tractors.

303. (3-2).

(a) Theoretical: Field artillery drill regulations, gunnery, and artillery firing.

(b) Practical: Use of fire control instruments, determination of firing data. Smoke bomb firing.

304. (3-2).

(a) Theoretical: Artillery firing; percussion precision firing, lateral observation, use of range tables, artillery firing maps, etc. Field artillery tactics, organization, communication, and reconnaissance. Military law.

(b) Practical: Conduct and observation of fire terrain board. Reconnaissance. Non-commissioned officers, with battery mounted. Communications.

403. (3-2).

(a) Theoretical: Administration and army paper work. Artillery tactics.

(b) Practical: Duties as battery officers and instructors.

404. (3-2).

(a) Theoretical: Artillery tactics. Military history and policy of the United States.

(b) Practical: Same as 403 (b).

SIGNAL CORPS UNIT

Professor: Arthur E. Micklesen, First lieutenant, Signal Corps.

105. (1-2).

(a) Theoretical: Organization of army, hygiene, first aid, military courtesy, interior guard duty, infantry drills, automatic pistol, military telephones.

(b) Practical: Infantry drill, operation of radio sets and military telephones.

106. (1-2).

(a) Theoretical: Lectures on army organization, lines of communication, pistol marksmanship, telephone net.

(b) Practical: Drill, message sending by radio telegraph, telegraph operating, military telephone line construction.

205, 206. (1-2).

(a) Theoretical: Lectures on army organization, lines of communication, map reading and technical equipment used by Signal Corps, radio procedure.

(b) Practical: Drill, telephones, military map making, construction of telephone lines, operation of switchboards, radio telegraph and telephone operation in the field.

305, 306. (1-2, 0-2).

(a) Theoretical: Drill, minor tactics of line troops, organization and tactics of all arms to include division signal tactics, message centers, codes and ciphers, line route maps, etc., staff organization and duties. Military law.

(b) Practical: Putting the above theoretical work into field practice.

In addition to the above the student must complete Electrical Engineering 309 and 310.

(Elective in V).

405, 406. (0-2, 1-2).

(a) Theoretical: Military history and the policy of the United States, administration, telephone net construction, field engineering, rules of land warfare.

(b) Practical: Handling of organizations in practical signal corps field duty, technical and tactical operation of radio telegraph and telephones.

In addition to the above the student must complete Electrical Engineering 409 and 410.

AIR SERVICE UNIT

Professor: Albert M. Guidera, Captain, Air Service.

109, 110. (1-2).

(a) Theoretical: Organization andadministration or squadron; duties of commanders; military courtesy and customs of the service; interior guard duty; infantry drill; nomenclature, care and handling of pistol and rifle; history of aeronautics; employment of air service, air service organization.

(b) Practical: Organizing the unit, assignment of leaders; performance of guard duty; infantry drill; rifle and pistol practice; visual signalling and buzzer.

209, 210. (1-2).

(a) Theoretical: Military sketching and map reading; infantry drill, principles of leadership; air service weapons, automatic rifle and aerial machine guns; aerial sights and principles of aerial gunnery; synchronized gears; military hygiene.

(b) Practical: Map sketching, infantry drill; machine gun, rifle and pistol firing; nomenclature and stripping of machine guns; problems in minor tactics; radio.

309, 310. (3-2).

(a) Theoretical: Field engineering, construction of trenches and obstacles; minor tactics, offensive and defensive conduct of small units; artillery and infantry liaison; radio, aerial photography, types of cameras, interpretation of aerial photographs, map making from aerial photographs; aeronautical engines, principles of engines, carburetors, ignition, lubrication, cooling, trouble shooting, types of engines; aerial gunnery, aerial bombing. Military law.

(b) Practical: Trench construction; map maneuvers; radio practice; construction of mosaic from aerial photographs; assembling aeronautical engines.

409, 410. (3-2).

(a) Theoretical: Military history and policy of the United States; development of aeronautics; rules of land warfare; administration of the squadron; advanced radio communications; aerial navigation and meteorology; air service organization, operations, aerial tactics, bombardment; pursuit and attack duties of air service officers; methods of teaching flying, airplanes, theory of flight, nomenclature, rigging, repair of machines; airplane instruments; types of airplanes.

(b) Practical: Radio communications; rigging, repair of machines.

DEPARTMENT OF MODERN LANGUAGES

Professor Campbell, Assistant Professor Ingenhuett, Mr. Woolket.

In beginning courses a thorough drill in pronunciation, the essentials of grammar, and colloquial exercises is given through daily oral and written exercises. The reading of simple texts is taken up as early as possible.

The work of the advanced courses consists in the reading of selected texts and magazines, with incidental grammar review and drill in the use of colloquial idioms. Short dictation exercises are frequently given. Special stress is laid upon sight reading. Parallel reading of from 150 to 300 pages of selected prose works is required. In French and German, the reading is gradually adapted to the scientific work of other departments; the texts read in Spanish are literary and commercial.

A modern language is required throughout the freshman and sophomore years in courses X and XIX; French is required throughout the junior and senior years in course IX, group 1; otherwise the work in modern languages is elective in all four-year courses.

101, 102. *French.* (3-0).
Grammar and easy reading.
(Required in IX, group 1).

103, 104. *German.* (3-0).
Grammar and easy reading.

105, 106. *Spanish.* (3-0).
Grammar and easy reading.

201, 202. *French.* (3-0).
Reading of scientific and other texts. Parallel reading.
(Required in IX, group 1).

203, 204. *German.* (3-0).
Reading of scientific and other texts. Parallel reading.

205, 206. *Spanish.* (3-0).
Reading of selected texts; composition; conversation. Parallel reading.

216. *Spanish.* (3-0).
Commercial Spanish; reading of commercial and technical texts and periodicals; social and commercial correspondence.
Prerequisite: Course 205 or equivalent.

301, 302. *French.* (3-0).
Modern French: the study of representative works from the beginning of the nineteenth century to the present time.
First term, the novel: texts selected from the works of Hugo, Balzac, Maupassant, Daudet, Zola, and France.
Second term, the drama: plays by Hugo, Dumas, Augier, Labiche, Scribe, Rostand, and others.

305, 306. *Spanish.* (3-0).
Modern Spanish: the study of representative works from the beginning of the nineteenth century to the present time.
First term, the novel: Texts selected from the works of Alarcon, Romanos, Ibanez, Valera, and Galdos.
Second term, the drama: plays by Gutierrez, Arce, Sierra, and Benavente.

DEPARTMENT OF MUNICIPAL AND SANITARY ENGINEERING

Professor Steele

401. *Sewerage and Sewage Disposal.* (3-0).

Determination of the quantity of storm water and domestic sewage; design and construction of sewer systems; principles of sewage treatment; methods of treatment; operation of sewage disposal plants; plumbing systems.

Text: Sewerage and Sewage Disposal, Metcalf and Eddy.

Prerequisite: Civil Engineering 311.

(Required in IV, group 3).

402. *Water Supply and Purification.* (3-0).

Development of ground and surface water supplies; principles and methods of water purification; design, construction and operation of waterworks systes for municipalities.

Text: Public Water Supplies, Turneaure and Russell.

Prerequisite: Civil Engineering 311.

(Required in IV, group 3).

403, 404. *Sanitary Design.* (0-4).

Practical problems in the design of sewer systems and appurtenances; sewage disposal plants; water collection and distribution systems; water purification plants.

Text: To be selected.

Prerequisite: To be taken with Municipal and Sanitary Engineering 401 and 402.

(Required in IV, group 3).

406. *Sanitation and Public Health.* (3-0).

Relation of sanitation to public health; municipal sanitary work, including garbage and refuse disposal; control of food supplies; mosquito, fly and rodent control; sanitation of swimming pools and tourist camps; organization of health departments.

Text: To be selected.

Prerequisite: Junior or senior classification.

(Required in IV, group 3).

407. *Rural Sanitation.* (2-0).

Relation of sanitation to health; necessity for and methods of safeguarding farm water supplies; safe sewage disposal for rural homes; malaria control; hookworm control; sanitation of rural schools; county health work; the role of milk in the carriage of disease and sanitary requirements of municipalities governing rural dairies.

Text: To be selected.

Prerequisite: Junior or senior classification.

(Elective).

408. *Municipal Administration.* (2-0).

City government, including the city manager plan; administration of city departments; public utilities; city planning.

Text: An Outline of Municipal Government, Maxey.
Prerequisite: Junior or senior classification.
(Required in IV, group 3).

410. *Sanitary Engineering.* (4-2).

The collection, storage and distribution of water for municipal use; necessity for and methods of water purification; design and construction of waterworks systems. Quantity of sewage; design, construction and maintenance of sewer systems; sewage disposal.

Practice includes problems in the design of water supply and sewerage works.

Texts: Public Water Supplies, Turneaure and Russell; Sewerage and Sewage Disposal, Metcalf and Eddy.

(Required in IV, groups 1, and 2).

FOR GRADUATES

501, 502. *City Management.* (4-0).

Development of European and American cities; forms of city government, functions of the city manager; administration of municipal affairs; organization of city departments; city finances; public utilities; fire prevention and protection; police administration; parks and playgrounds; tourist camps; public health and welfare; housing; city planning.

503, 504. *Sanitary Engineering.* (4-0).

Principles and methods of sewage treatment; principles and methods of water purification; garbage and refuse collection and disposal; mosquito control; sanitation and public health.

DEPARTMENT OF PHYSICAL EDUCATION

Professor Bible, Professor House, Associate Professors Anderson, Rothgeb, Bender, Mr. Sprague.

The work of the Department of Physical Education is given in the following divisions:

1. Physical Training and Corrective Gymnastics.
2. Intramural Athletics.
3. Courses for Training Teachers of Physical Education.
4. Intercollegiate Athletics.

1. *Physical Training and Corrective Gymnastics.*

(a) Physical examination of freshmen and individual advice regarding defects of any nature. Classification of each case according to physical exercise, capacity and needs.

(b) Health talks to freshmen at frequent intervals throughout year.

(c) Freshman physical training correlated with the corrective program and the intramural program in such a way that every freshman participates in some form of physical activity suitable to his health and physical needs. This work is given two hours a week throughout the year in ten sections.

(d) Individual gymnastics.

2. *Intramural Athletics.*

Numerous intramural games and contests between classes and military organizations to utilize the competitive spirit in the development of sound bodies, self-control and athletic proficiency. Practically all students take part in some form of intramural athletics.

3. *Courses for Training Teachers of Physical Education.*

4. *Intercollegiate Athletics.*

The Department of Physical Education has charge of all intercollegiate athletics, under the regulations laid down by the College and by the Southwest Athletic Conference. Intercollegiate contests are now held in the following sports: Football, basketball, track, baseball, tennis, cross country, golf.

303, 304. *Personal and Community Hygiene.* (3-0).

A non-technical course planned for teachers in the public schools as well as special teachers of physical education. Such topics as nutrition, exercise, nervous system, reproduction, disease prevention and control, immunity, mental hygiene, hygiene of special organs, etc., are considered.

Prerequisite: Junior standing.

305. *Public School Physical Training.* (2-4).

An elective course. The course is designed for teachers of physical education in the public schools. Calisthenics, marching, gymnastics, plays and games are taught and practice work in teaching is required.

306. *Public School Physical Training.* (0-2).

This course is a continuation of the practice teaching of course 305, and is required if 305 is elected.

Prerequisite: Course 305. Junior standing, and especial aptitude for work in Physical Education.

311, 312. *Athletic Coaching.* (3-2).

An elective course in the theory and practice of athletic coaching. Football, basketball, baseball, track, tennis, and the administrative details of each sport are considered.

Prerequisite: Junior standing, and especial proficiency in athletic sports.

DEPARTMENT OF PHYSICS

Professor Silvey, Assistant Professors Vezey, Brock, Mr. Foster, Mr. McCorkle, Mr. E. G. Smith.

201, 202. *College Physics.* (3-2).

A general course in physics for students in general science courses and those preparing to enter a medical school.

This course includes the mechanics of solids, liquids and gases; and the phenomena of heat, light, sound, electricity and magnetism. Instruction is given by recitations, quizzes, problems and demonstrated lectures. Emphasis is laid upon the fundamental principles rather than the mathematical processes involved.

The practice includes about thirty experiments in the subjects named above.
Laboratory fee, 50 cents each term.
(Required in X; elective in XIX).

203, 204. *General.* (3-3).

A general course in mechanics, heat, light, electricity and magnetism for engineering students.

Stress is laid on the derivation of the various formulas necessary for an understanding of the mathematical relations existing in physical determinations. Emphasis is placed on practical problems.

The practice includes about thirty experiments in the subjects named above. The work is, in general, quantitative.

Text: General Physics, Ferry.
Prerequisite: Mathematics 101, 103.
Laboratory fee, $1.00 each term.
(Required in all engineering courses except V, and in IX groups 1, 2; XIII; XV).

207, 208. *General.* (3-2).

This course is identical with course 203, 204, with the omission of electricity and magnetism.

Prerequisite: Mathematics 101, 103.
Laboratory fee, $1.00 each term.
(Required in V).

301, 302. *Heat and Properties of Matter.* (3-3).

A discussion of universal gravitation, elasticity, surface tension, diffusion, viscosity, mechanics of fluids, laws of heat transfer, kinetic theory, critical points, isothermal and adiabatic changes and the thermodynamics of changes of state and radiation.

The work is more descriptive than mathematical, but ample opportunity is offered to study the application of the calculus to physics.

Texts: Properties of Matter, Heat; Poynting and Thompson, or equivalents.
Prerequisite: Physics 201, 202, 203, 204 or 207, 208, and Mathematics 203, 204.
Laboratory fee, $2.00 each term.
(Elective).

305. *Light.* (2-0).

A discussion of the wave theory of light, optical instruments, dispersion, spectroscopy, aberrations, refraction, interference, diffraction, polarization, double refraction and theories of refraction and reflection.

The treatment is non-mathematical.
Text: Edser's Light for Students, or its equivalent.
Prerequisite: Physics 201, 202, 204 or 207.
(Elective).

307, 308. *Experimental Physics.* (0-4).

A laboratory practice course to supplement any of the courses in theoretical physics.

The experiments performed are illustrative of the theory being discussed in the theoretical course. It is intended that this course shall develop laboratory

technique preparatory to research work.

Manual: Watson's Practical Physics, or its equivalent.

This course must be preceded by, or taken in parallel with one of the courses in theoretical physics.

Laboratory fee, $2.00 each term.

(Elective).

401, 402. *Optics; Electricity and Magnetism.* (3-3).

A discussion of periodic motion, wave motion, the nature and propagation of light, interference, diffraction, theory of optical instruments, polarization, magnetism, magnetic induction and potential, current electricity, electrostatic induction and potential, electromotive forces, thermal effects, photo-electricity, electro-magnetic induction and electro-magnetic theory.

Texts: Optics, The Theory of Optics, Part I, Schuster, or equivalent; Magnetism and Electricity, Poynting and Thompson, or equivalent.

Prerequisite: Physics 201, 202 or 203, 204 and Mathematics 203, 204.

Laboratory fee, $2.00 each term.

(Elective).

403, 404. *Kinetic Theory; Electron Theory.* (3-0).

A study of gas pressure, speeds of gaseous molecules, Boyle's law, determination of the gas constant, the law of Gay-Lussac, Graham's law, law of diffusion, the mean free path, viscosity, Maxwell's distribution law, the phenomenon of conductivity of electricity through gases, mobility and diffusion of gaseous ions, measurement of the elementary charge, ratio of charge to mass of ions, positive ions, photo-electric action, Brownian movements.

Prerequisite: Physics 301, 302 and Mathematics 203, 204.

(Elective).

FOR GRADUATES

501, 502. *Analytical Mechanics.* (3-0).

A study of rectilinear motion, plane and solid motion of a point, plane and solid rotational motion, mechanisms, strains, kinetics of a particle, kinetics of a rigid body, statics, attraction and potential, plane and solid statics of a rigid body, hydrostatics and Hydrokinetics.

Text: Analytical Mechanics, Barton, or the equivalent.

503, 504. *Advanced Electricity and Magnetism.* (3-0).

A study of the underlying principles of alternating electrical currents; the development of graphical methods of analysis as a basis for the solution of practical problems. The development of the equations for the propagation of an electromagnetic disturbance through a dielectric and for electromagnetic waves along wires and cables. A study of electrostatic and electromagnetic fields, the electromagnetic theory of light, thermal and electrical conductivity, conduction in magnetic fields, discharge of electricity through gases, Roentgen rays, Becquerel rays and the theory of the structure of the atom.

DEPARTMENT OF POULTRY HUSBANDRY

Professor Reid, Assistant Professor Irving

102. *Farm Poultry.* (2-2).

A general course in farm poultry. The breeds and types of poultry, culling of poultry for egg production, incubation, brooding and feeding for growth and egg production, winter and summer management, housing and hygiene, preparing poultry for market, methods of marketing; the practical application of these subjects to general farm conditions.

Text: Poultry Production, Lippincott.

The practice consists of the identification of breeds and varieties, judging poultry as to sex, age, constitutional vigor and egg production, plans for poultry farms and poltry houses, identification of feeds, methods of dressing poultry.

Laboratory fee, 50 cents.

(Required in XII, XVI, elective in I, C).

301. *Preparing Poultry Products for Market.* (2-2).

Pen fattening, crate fattening, fattening of the turkey flock, special feeds for ducks and geese, methods of dressing, trussing and deboning the fowls, candling eggs, preparing for cold storage and the crating of poultry products.

Text: Productive Poultry Husbandry, Lewis.

The practice includes feeding two crates of fowls, dressing and preparing them for market, candling and grading eggs.

Laboratory fee, 50 cents.

(Required in I, group 11).

302. *Feeding and Brooding Poultry.* (3-2).

Common grains and mill feeds for poultry, chemical composition, vitamine content and value as poultry feeds, embryology of the chick, artificial incubation and brooding; summer feeding of growing chicks.

Text: Poultry Production, Lippincott.

Prerequisite: Poultry Husbandry 201.

The practice includes anatomy of the common fowl, identification of digestion and egg production organs, identification and mixing of poultry feeds, management of four kinds of incubators, identification of twenty incubators, operation of three or more incubators for a period not to exceed three weeks.

Laboratory fee, $1.00.

(Required in I, group 11).

401. *Poultry Culling and Management.* (2-2).

The underlying principles of poultry culling, a study of literature, methods of pedigree mating and hatching. Management of hatcheries. Running a mammoth incubator.

Text: Practical Poultry Management, Rice and Botsford.

Prerequisite: Poultry Husbandry 201.

The practice includes a study of the various feather markings, types and inheritance factors in poultry.

(Required in I, group 11).

402. *Poultry Farming.* (2-2).

The laying out of poultry farms, costs and management of raising a flock of one thousand or more, types of houses, incubators and brooders suitable, raising of special types of poultry, teaching and demonstration plans.

Text: Productive Poultry Husbandry, Lewis.

Prerequisite: Poultry Husbandry 201.

The practice consist of problems in organizing, financing and establishing a commercial poultry business.

(Required in I, group 11).

403. *Judging Standard Bred Poultry.* (2-2).

The judging of all the standard breeds and varieties, special instruction to judges, methods of fitting for the show room, methods of breaking ties in poultry shows, standard disqualifications and special disqualifications for the different varieties.

Text: American Standard of Perfection, American Poultry Association.

Prerequisite: Poultry Husbandry 201.

The practice consists of judging classes of exhibition poultry raised on the College poultry farm and the judging of two or more small shows in the surrounding communities.

(Required in I, group 11).

421. *Advanced Incubation Problems.* (2-4).

This course includes the actual running of at least two mammoth incubators and the different adjustment of these machines under various conditions of heat and moisture, to secure maximum hatches of live healthy chicks. The use of the hair hygrometer, the self recording thermometer and the effect of different degrees of heat and moisture will be worked out in practice periods.

Prerequisite: Poultry Husbandry 201, 302.

422. *Advanced Brooding Problems.* (2-4).

This course includes a study of vitamines as far as they relate to the nutrition of the baby chick. The optimun percentage of the different proteins and other nutrients. The optimun temperature and the identification of symptoms of over feeding, under feeding, lack of vitamines, over heating and heating insufficiently.

Prerequisite: Poultry Husbandry 201, 302.

FOR GRADUATES

501, 502. *Research Poultry Husbandry.* (2-4).

This course includes a study of the recent investigations in poultry breeding and nutrition. Research methods are given special attention. Experiment station literature, scientific journals and newer publications are to be read and reported on by the student.

503, 504. Adv. Incubation & Brooding (2-4)

DEPARTMENT OF RURAL EDUCATION

Professor W. L. Hughes, Associate Professor Wilcox

RURAL EDUCATION

121, 122. *Elementary School Methods.* (3-2).

Methods of teaching the elementary school subjects, with special attention to the teaching problems of the rural teacher. Special attention will be given to such problems as fitting the course of study to the smaller rural schools, daily programs, and correlation of subjects.

(Required in XVI).

221, 222. *Rural School Administration.* (3-0).

This course will cover the administrative problems of the rural and village schools, such as community leadership; evaluating the teachers' efficiency; testing, grading and promotion of pupils; teachers 'institutes; county supervision; keeping school records; cooperating with agencies for rural school improvement.

(Required in XVI).

321, 322. *Secondary School Methods.* (3-2).

This course is designed to meet the needs of students who expect to teach in city high schools. Special attention will be given to the teaching of high school subjects, and to the organization and administration of junior and senior high schools.

(Required in XVI).

421, 422. *History of Education.* (3-0).

The first term will be given to the educational doctrines of ancient times. The second term will cover modern education. Special attention will be given to the educational systems of modern times with present tendencies in education.

(Required in XVI; 422 required in XIII).

FOR GRADUATES

501, 502. *Problems in Rural Education.* (4-0).

An intensive study of the problems of consolidation, administration, school finances, the curriculum, relation of school to community, with special reference to the rural schools of Texas. Special surveys including one or more of these problems are required in this course.

RURAL SOCIOLOGY

Professor White

201. *Introduction to Social Problems.* (3-0).

An introduction to some of the more important present day social problems. Such matters as immigration, marriage and divorce, industrial relations, race conflict, propaganda, and international conflict will be taken up for brief analysis.

Text: Problems of Citizenship, Baker-Crothers and Hudnut.

(Elective in I, XII).

202. *Social Evolution.* (3-0).

The origin and development of human society and certain of its institu-

tions. Particular attention will be given to the evolution of the family and religion.

Text: Social Evolution, Chapin.

(Required in XII).

311. *Social Psychology.* (3-0).

An analysis of the stimuli and responses of human beings to one another in society and to the accumulated culture. At the beginning of the course some attention will be given to the neurological foundations of social behavior.

Text: Social Psychology, Allport.

(Required in I, group 12; X, XVI).

314. *Social Organization.* (3-0).

A study of the structure of society. Both urban and rural aspects of social structure will be considered. Emphasis is placed upon methods of investigation and statistical analysis of social data.

Text: Field Work and Social Research, Chapin.

(Required in I, group 12; XVI; elective in X).

407. *Rural Sociology.* (2-2).

An analysis of the conditions, forces and agencies influencing the life of the country dweller and the country community; a detailed study of a number of special problems related to the social side of country life, such as population, questions; city-ward drift; town and country relationships; rural health problems; recreation; rural leadership; community organization; certain rural institutions.

Text: Rural Sociology, Gillette.

(Required in I, group 12; XII, XIV).

FOR GRADUATES

501, 502. *Advanced Rural Sociology.* (4-0).

In this course a nintensive study will be made of some important aspects of the field of rural sociology. The first term will be concerned mainly with the evolution of rural society; the second term with an analysis of some of the principal rural social problems of today and proposed solutions.

509, 510. *History of Social Theory.* (4-0).

Seminar in the history of social theories which have been held by some of the leading thinkers in this field. Material for the course will be drawn from such writers as the following: Plato, Aristotle, Macchiavelli, Rousseau, Hobbes, Comte, Malthus, Spencer, Ward, Giddings, Small, Tarde, Ross, Hobhouse, Lowie, Rivers, etc.

DEPARTMENT OF RURAL SOCIOLOGY

NOTE.—The courses in Rural Sociology have been transferred for the present to the Department of Rural Education.

DEPARTMENT OF TEXTILE ENGINEERING

Professor Bagley, Associate Professors Dowd, Lichte, Mr. Baker.

101, 102. *Cotton Classing.* (0-2).
Practice in grading and stapling cotton, the methods of handling the crop from the field to the mill. Other subjects of general interest to a cotton student are presented in lecture form.
Laboratory fee, 50 cents each term.
(Required in C; 102 in I, XII, XVI, XVII, XX, XXI).

103, 104. *Weaving.* (0-3).
Practice in operating plain and dobby looms.
(Required in XVII).

105. *Cotton Office Methods.* (3-0).
Detail office work, keeping account of purchases and sales of cotton. Filing systems.
(Required in XVIII).

107, 108. *Cotton Classing.* (0-5).
A modification of courses 101, 102, together with the use of office paper work.
Laboratory fee, $1.00 each term.
(Required in XVIII).

111, 112. *Yarn Manufacture.* (0-3, 3-3).
A modification of courses 301, 302.
Text: Cotton Yarn Manufacture, Winchester.
(Required in XVII).

114. *Cotton Exchanges.* (3-0).
History and purposes of cotton exchanges, operation and details
Text: Cotton and the Cotton Market, Hubbard.
(Required in XVIII).

206. *Yarn Manufacture.* (0-3).
Practice in operation of machinery used in the manufacture of cotton yarns.
(Required in VI).

207. *Weaving.* (0-3).
Practice in operating plain looms.
(Required in VI).

211, 212. *Cotton Classing.* (0-5).
A continuation of courses 107, 108.
Laboratory fee, $1.50 each term.
(Required in XVIII).

216. *Stock Markets.* (3-0).
(Required in XVIII).

217. *Foreign Cotton Markets.* (0-3).
A study of foreign moneys and their relative value, calculation of American contracts in foreign money.

Text: Elements of Foreign Exchange, Escher.
(Required in XVIII).

301, 302. *Yarn Manufaucture.* (2-3, 0-2).

Recitations on the machinery and processes in the manufacture of coarse cotton yarns. Instruction is given with a view of imparting a general knowledge of the machinery and processes, including the study of the raw material; mixing; construction and operation of picking machinery, carding, drawing, slubbing, roving, ring spinning, spooling, reeling, and twisting; calculations to determine the necessary gearing to produce given numbers, speeds and production.

Text: Cotton Yarn Manufacture, Winchester.
(Required in VI, 301 required in XVIII).

303, 304. *Fabric Designing.* (0-3).

The classifiication of fabrics; the elementary principles of fabric structure; the explanation of various technical terms applied to designs and fabrics; the representation of drawing-in drafts and harness chains; the design of fancy shirting, madrases, and dress goods, etc.
(Required in VI, XVII).

307, 306. *Weaving.* (3-3).

Recitation and lectures on the construction, operation and adjustments of plain, automatic, gingham, dress goods, and Jacquard looms.

Text: International Library of Technology, Vol. 80.
(Required in VI, XVII).

401, 402. *Yarn Manufacture.* (3-2, 2-3).

A continuation and more exhaustive treatment of courses 301, 302. A study of warp preparation, combers, mules, and organizations for the manufacture of all classes of yarns.

Text: International Library of Technology, Vols. 76, 77.
(Required in VI; 402 in XVII).

404. *Fabric Analysis.* (1-0).

Dissection of small samples, data for their reproduction.
Prerequisite: Textile Engineering 303, 304.
(Required in VI, XVII).

410. *Mill Management.* (3-0).

Lectures and recitations on the general management of cotton mills, including the study of fire protection, cost of production in the various departments, labor conditions and wages, care of mill and mill village.

Texts: International Library of Technology, Vol. 78; The Cotton Manufacturing Industry of the United States, Copeland.
(Required in VI, XVII).

412. *Magazine Review.* (1-0).

Students report in class on articles assigned them in the textile magazines.
(Required in VI, XVII).

413, 414. *Cotton Classing.* (1-2, 0-2).

Recitation and lecture on classification and stapling of cotton, buying spot

cotton, papers used in the cotton trade and cotton exchanges.
Laboratory fee, 50 cents.
Text: Cotton and the Cotton Market, Hubbard.
(Required in VI, XVII).

415, 416. *Fabric Designing.* (0-3).
A continuation of course 304.
Prerequisite: Textile Engineering 304.
(Required in VI).

417. *Yarn Manufacture.* (3-0).
Same as course 401 without practice.
(Required in XVII).

419, 420. *Weaving.* (1-2, 0-3).
A study of loom fixing, cloth room machinery, and yarn dressing.
Texts: Practical Loom Fixing, Nelson; International Library of Technology, Vol. 78.
(Required in VI).

DEPARTMENT OF VETERINARY ANATOMY

Professor Francis.

111. *Anatomy of the Domestic Animals.* (3-6).
A careful study of the bones, joints and muscles.
Text: Anatomy of Domestic Animals, Sisson.
Laboratory fee, $4.00.
(Required in XI, XXI; elective in I).

112. *Anatomy of the Domestic Animals.* (3-6).
A study of the thoracic and abdominal viscera.
Text: Anatomy of Domestic Animals, Sisson.
Laboratory fee, $4.00.
(Required in XI, XXI; elective in I).

211. *Anatomy of the Domestic Animals.* (3-6).
This course includes a dissection of the circulatory system, the nervous system and the organs of special sense.
Text: Anatomy of Domestic Animals, Sisson.
Laboratory fee, $4.00.
(Required in XI, XXI; elective in I).

213. *Histology and Embryology.* (2-4).
A lecture and laboratory course.
Texts: Normal Histology, Stohr; Embryology of the Chick and Pig, Prentiss.
Laboratory fee, $4.00.
(Required in XI, XXI; elective in I).

302. *Anatomy and Psyhiology of Domestic Animals.* (2-2).

This course is intended as an introduction to the study of veterinary medicine. It treats the fundamental processes of animal nutrition in detail, so that each student may be prepared to meet the problems that arise in the economic production of beef, pork, and dairy products.

Reference books: Physiology of Domestic Animals, Smith; Veterinary Anatomy, Sisson.

Laboratory fee, $1.50.

(Required in I, group 5).

306. *Animal Diseases.* (3-2).

A popular course on the common diseases of animals on the farm

Text: Principles of Veterinary Science, Hadley.

(Required in XII, XVI; elective in C).

312. *Topographical Anatomy.* (0-6).

Prerequisite: Courses 111, 112, 211.

Text: Topographical Dissection Guide, Stewart.

(Elective).

FOR GRADUATES

511, 512. *Veterinary Anatomy.* (2-4).

DEPARTMENT OF VETERINARY MEDICINE AND SURGERY

Professor Marsteller, Associate Professors Lenert, Dunn.

351. *Non-infectious Diseases.* (3-0).

This course consists of lectures and demonstrations on physical diagnosis.

(Required in XI, XXI).

352. *Non-infectious Diseases.* (3-0).

In this course instruction is given on diseases of the digestive, circulatory, respiratory and urinary organs.

(Required in XI, XXI).

361. *General Surgery.* (3-0).

In this course instruction is given in the principles of surgery, restraint of domestic animals, surgical diagnosis, surgical exercises and soundness.

(Required in XI, XXI).

362. *General Surgery.* (3-0).

(Required in XI, XXI).

371. *Clinics.* (0-7).

372. *Clinics.* (0-12).

471. *Clinics.* (0-7).

472. *Clinics.* (0-7).

All students taking clinics are required to give attention daily to cases assigned, and if necessary laboratory diagnosis and post-mortem examinations must be conducted. When necessary students will be required to visit sick animals on farms, ranches and other premises near the College. Trips to other parts of the State are required when outbreaks of diseases occur that can not be studied at the College. About twenty-five hundred cases of non-infectious diseases, infectious diseases and surgical diseases of animals and fowls are treated each year.

(Required in XI, XXI).

403. *Animal Diseases.* (3-2).

A discussion of common infectious and non-infectious diseases of domestic animals.

Text: Veterinary Medicine, Vols. 1, 2, 3, 4, 5, Law.

Prerequisite: Veterinary Anatomy 304.

(Required in I, group 5).

451. *Diseases of Small Animals and Fowls.* (3-0).

In this course special attention is given to non-infectious and infectious diseases in pet animals and domestic fowls.

(Required in XI, XXI).

452. *Practice of Veterinary Medicine and Jurisprudence.* (3-0).

The aim of this course is to acquaint the student with general business methods and State and national laws relating to the practice of veterinary medicine.

(Required in XI, XXI).

453. *Infectious Diseases.* (3-0).

This course involves the study of the symptoms, treatment and control of infectious diseases.

(Required in XI, XXI).

455. *Diseases of Poultry.* (2-0).

In this course instruction is given in diseases of poultry.

(Elective in all Agricultural and Vocational Teaching groups).

461. *Obstetrics.* (2-0).

This course treats of accidents of breeding, diseases incidental to pregnancy, parturition and post-partum conditions. Attention is also given to diseases of the newly born.

(Required in XI, XXI).

462. *Operative Surgery.* (3-4).

In this course instruction is given in castrating, spaying, dentistry, lameness, shoeing. Surgical exercises are required.

Laboratory fee, $5.00.

(Required in XI, XXI).

464. *Diseases of the Reproductive Organs.* (2-2).

This course deals largely with the causes and treatment of sterility of domestic animals. Some time will be given to infectious diseases of the productive organs.

Prerequisite: Veterinary Medicine 461.
Text: Diseases of the Genital Organs of Domestic Animals. Williams.
(Elective).

FOR GRADUATES

501, 502. *Special Surgery.* (2-4).
This course deals with problems of surgical conditions, surgical pathology, surgical technique and sterility of animals.
Laboratory fee, $10 each term.

DEPARTMENT OF VETERINARY PATHOLOGY

Associate Professor Price.

242. *General Pathology.* (3-2).
The elementary disease processes and their causes, including a study of the gross and minute appearance of the diseased tissues. Such processes as inflammation, necrosis, gangrene, atrophy, hypertrophy, ulceration; the various degenerations, infiltrations, pigmentations and tumor formations are considered.
The practice consists of the microscopical study of these processes and instruction in laboratory technique.
Reference: General Pathology, Ziegler; Text-book of Comparative General Pathology, Kitt; Text-book of Pathology, Delafield and Prudden; Pathological Technique, Mallory and Wright.
Prerequisite: Veterinary Anatomy 213.
Laboratory fee, $1.50.
(Required in XI, XXI).

341, 342. *Special Pathology.* (2-0, 2-4).
Lectures on the special systematic pathology and morbid anatomy of the different organs and systems of organs. The pathology of the various infectious and contagious diseases is considered.
The practice includes the demonstration of museum and fresh specimens, and an introduction to post-mortem technique.
References: Pathology and Therapeutics of the Diseases of Domestic Animals, Hutyra and Marek; Veterinary Post-mortem Technic, Crocker.
Laboratory fee, $4.00, second term.
Prerequisite: Veterinary Pathology 242.
(Required in XI, XXI).

343. *Special Bacteriology.* (2-4).
The pathogenic micro-organisms; their morphology, cultural characteristics and pathogenicity are considered.
The practice work consists of the study of the more important micro-organisms which produce diseases in man and domestic animals.
References: Microbiology, Moore; Veterinary Bacteriology, Buchanan; A Text-book of Bacteriology, Hiss and Zinser.
Prerequisite: Biology 209, or its equivalent.
Laboratory fee, $4.00.
(Required in XI, XXI).

441. *Immunology and Serum Therapy.* (2-2).

The fundamental principles of immunity. Special attention is given to the preparation of biologics used in the prevention of infectious diseases.

Prerequisite: Veterinary Pathology 343.

Laboratory fee, $4.00.

(Required in XI, XXI).

442. *Meat Hygiene.* (2-2).

The abattoir inspection of meats and meat products; the Federal regulations governing such inspection, condemnation and disposal of carcasses, also the regulations governing interstate and foreign shipments of live stock.

Text: Meat Hygiene, Edelmann, Mohler and Eichorn.

Prerequisite: Veterinary Pathology 341, 342.

(Required in XI, XXI).

443. *Parasitology.* (2-2).

The parasites infesting the domestic animals, and the pathological conditions produced by them. Attention is given to the treatment and control measures.

Prerequisite: Biology 201, 202, or equivalent.

Laboratory fee, $1.50.

(Required in XI, XXI).

444. *Laboratory Diagnosis.* (2-2).

The methods of procedure in the preparation of materials for laboratory examination; the technique of examination; biological tests of special importance.

Prerequisite: Veterinary Pathology 341, 342, 343.

Laboratory fee, $2.00.

(Required in XI, XXI).

FOR GRADUATES

541, 542. *Advanced Special Pathology.* (3-4).

Etiology, pathogenesis, lesions and results of diseases of organs and systems of organs; pathology of the infectious diseases.

Prerequisite: Veterinary Pathology 242, or equivalent.

Laboratory fee, $5.00 each term.

543, 544. *Advanced Special Bacteriology.* (3-4).

A study of the pathogenic micro-organisms; their cultural and biological characteristics and pathogenicity.

Prerequisite: Biology 209, or equivalent.

Laboratory fee, $5.00 each term.

DEPARTMENT OF VETERINARY PHYSIOLOGY AND PHARMACOLOGY

Associate Professor Blackberg.

121. *Physiology of the Domestic Animals.* (2-0).

Lectures on the physical and chemical processes involved in the physiological functioning of the bodies of the domestic animals.

(Required in XI, XXI; elective in I).

122. *Physiology of the Domestic Animals.* (2-0).

Lectures on the physiology of the circulatory, respiratory, muscular and locomotor systems.

Prerequisite: Course 121.

(Required in XI, XXI; elective in I).

221. *Physiology of the Domestic Animals.* (2-0).

Lectures on the nervous system, including special senses, digestion, absorption, secretion and excretion.

Prerequisite: Course 122.

(Required in XI, XXI; elective in I).

222. *Physiology of the Domestic Animals.* (3-4).

Lectures on physiological chemistry, with special reference to digestive juices, enzymes, ferments, hormones, internal secretions, milk, urine, and chemical composition of the body.

The practice consists of studying blood, milk, urine, and other body fluids, including the action of natural and artificial digestive juices (enzymes) on the various foodstuffs. The student also makes graphic records of the physiological functioning of the muscular, nervous, respiratory, and circulatory systems.

Prerequisite: Course 221.

Laboratory fee, $2.50.

(Required in XI, XXI; elective in I).

333. *Pharmacology.* (3-4).

The general preliminary work in pharmacology; a detailed study in metrology of the history of therapeutics, the source and composition of drugs, the methods of administration, the various factors influencing the action of drugs upon the individual, and the active constituents of medicinal plants and posology; the drugs affecting the circulatory and nervous systems, including antipyretics, are then studied.

The practice consists of laboratory work in examining and identifying crude drugs, making tests for their purity, extracting their active constituents, making chemical tests for each. Pharmaceutical methods used in the manufacture of medicinal preparations are carefully studied and each student is required to make a definite number of all types of official preparations, described in the Pharmacopoeia and in addition a number of non-official preparations. Prescription filling, preparing, compounding and dispensing pharmaceutic preparations are all given ample consideration. The student is given an opportunity to observe the actions of drugs on experimental animals. The chemical and biological methods of standardization of medicinal preparations are taken up in detail.

Text: Veterinary Pharmacology and Theroapeutics, Milks.
Laboratory fee, $3.00.
(Required in XI, XXI).

334. *Pharmacology.* (3-0).
This course is a continuation of course 331 and takes up all the drugs not studied in that course.
Prerequisite: Course 333.
(Required in XI, XXI).

432. *Toxicology.* (1-2).
The causes, symptoms, lesions, prevention and treatment of organic and inorganic poisons, including poisonous plants and endogenous poisons.
In the practice, each student is required to make microscopical, chemical and biological analysis of the more common organic and inorganic poisons and poisonous plants. The student also observes the symptoms, lesions and methods of treatment of cases, produced by the more common poisons upon experimental animals.
Texts: Veterinary Toxicology, Lander; Medical Chemistry and Toxicology, Holland.
Laboratory fee, $2.50.
(Required in XI, XXI).

FOR GRADUATES

501, 502. *Advanced Practical Physiology.* (2-4).
This course affords opportunity for observations of the more intricate and recent phases of physiology. It is arranged for advanced students or teachers of physiology who wish to make a thorough study of modern experimental methods. The work will be arranged to suit the needs of the student and in harmony with his previous training.

503, 504. *Advanced Physiology of Nutrition.* (2-4).
A detailed study of the modern theories of nutrition with special reference to vitamines.

505, 506. *Advanced Poinsonous Plants.* (2-4).
Original investigations and detailed studies of the poisonous plants affecting domestic animals.

507, 508. *Advanced Experimental Pharmacology.* (2-4).
This course affords opportunity for studying the modern methods of research in pharmacology and pharmaceutical processes. It comprises original research in studying the actions and uses of drugs.

Part V

RESEARCH, EXTENSION, SUMMER SESSION, AND OTHER ACTIVITIES

THE TEXAS AGRICULTURAL EXPERIMENT STATION SYSTEM

B. YOUNGBLOOD, Director

The Texas Agricultural Experiment Station System is the research agency of the Agricultural and Mechanical College of Texas, and its function is the investigation and solution of agricultural problems. It consists of the central or Main Station at College Station with appropriate indoor laboratories and experiment station farms, and fifteen outdoor laboratories, or experiment station farms, located in various sections of Texas, as follows: Angleton, Beaumont, Beeville, Chillicothe, Denton, Lubbock, Nacogdoches, Balmorhea, Spur, Temple, Troup, Sonora, Llano Grande, Iowa Park and College Station. In addition, there are beeyards at Dilley, Seguin and Roxton, and a queenyard and the State Apicultural Research Laboratory located at San Antonio. The work of the Station System comprises researches into the more important problems of veterinary science, chemistry, horticulture, animal industry, botany, entomology, agronomy, plant pathology and physiology, plant breeding, forestry, farm and ranch economics, rural home research, and the Feed Control Service. The substations and other outdoor or field laboratories are utilized for extending the work of the Main Station so that Statewide information may be secured upon the various phases of the investigational work. The Station System is the source of valuable information for students of agriculture and the farmers and stockmen of the State. It is looked to for the facts by the School of Agriculture, the Extension Service, and other agencies for the dissemination of agricultural information. The work on the Main Station and on the Feeding and Breeding Substation (Substation No. 10) presents to students very unusual opportunities both in theoretical instruction and practical experience.

For this fiscal year, the Station System receives $50,000.00 Federal funds and $270,048.82 State appropriation.

A brief statement of the work of the Station System is as follows:

MAIN STATION

Veterinary Science:

The Division of Veterinary Science conducts researches covering the diseases of farm animals of various kinds. Special attention is being given to diseases affecting horses and mules, cattle, sheep, goats, and swine, and because of liberay appropriations by the Legislature, emphasis is being placed upon the study of the loin diseases of cattle.

Chemistry:

The Division of Chemistry conducts researches relating to feeding stuffs, soils, fertilizers, irrigation waters, minerals, paints, and miscellaneous analyses; the analysis of feeding stuffs for the Feed Control Service; and the enforcement of the State law regulating the sale of commercial frtilizers. The Chief of the Division is also State Chemist.

Horticulture:

The Division of Horticulture conducts investigations relating to fruits,

vegetables, and ornamental trees and shrubs, and the introduction and propagation of new and promising varieties of fruits, vegetables, and shrubs from foreign countries.

Range Animal Husbandry:

Under the Division of Range Animal Husbandry, researches are made with reference to the breeding, management, feeding, and grazing of range animals, such as sheep and Angora goats, and cattle. Special attention is being paid to inheritance and scientific breeding as related to the improvement of specially adaptd types of animals and the improvement of wool and mohair. This Division operates the wool and mohair scouring and grading plant, which is located at the Main Station. Substations No. 7, 10, and 14 are used extensively for researches relating to range animal husbandry.

Soil Survey:

The Division of Soil Survey is operated in cooperation with the Bureau of Soils of the United States Department of Agriculture, and its work is the detailed and reconnoissance soil survey of the entire State of Texas, by counties and areas. Soil surveying is merely the recording of the soil resources by types, or an inventory of the soil. The value of a soil survey is generally recognized by all classes of people as an aid to agricultural advancement.

Feed Control Service:

The State law regulating the sale of concentrated commercial feeding stuffs and the materials from which they are manufactured, provides for defining them, for prohibiting their adulteration; for correct weighing and marking, and for collecting of samples; it also provides for the expense of enforcing the law, and for fixing penalties; and places the enforcement of the act in the hands of the Director of the Texas Agricultural Experiment Station. The Director is empowered to adopt names, standards and definitions; to refuse registration of any feeding stuff under a name which would be misleading as to the materials of which it is made up, or which does not conform to the standards, and after ten days' notice to cancel such registration as may be found in violation of the law or contrary to the names, standards and definitions in effect.

The purpose of the Feed Control Service is to afford protection alike to buyers and sellers of feeding stuffs. Annual bulletins are issued, giving the names standards and definitions; lists of firms registered for the purpose of selling feeds in Texas, and the feeds offered by them, as well as the chemical composition of these feeds, as determined by the chemist for the Feed Control Service.

The Feed Control Service investigates problems encountered in the enforcement of the law, with reference to the feeding values of various feeds and combination of feeds. The results of these investigations are given to the people of the State through bulletins and circulars, issued from time to time.

Entomology:

The Division of Entomology conducts researches relating to the insect pests affecting the crops grown in Texas, including life-history and methods of control of the various species, as well as researches relating to the beekeeping industry of the State. The Chief of the Division is also State Entomologist, and as such has charge of the details of the enforcement of the law regulating foul brood in bees.

Agronomy:

The Division of Agronomy conducts researches with farm crops and soils, paying especial attention to the introduction of new and promising varieties, and the improvement of field crops by breeding methods. Particular attention has been given to breeding work with the grain sorghums, cotton, wheat, and other crops, not only toward improving them, but in the determination of the modes of inheritance of characters. Investigations are made as to tillage methods, methods of applying fertilizers, and the use of green manure crops for soil improvement. Through the introduction of new varieties and strains and the improvement of these and others by selection, marked increases have occurred in the acreage and production of the grain sorghums in Texas. Another accomplishment of great economic importance to the State, is the extension of the cotton-growing area of the State, brought about through early trials and tests of varieties followed by breeding work in Northwest Texas, which has opened up an extensive new cotton-growing region which is not infested with the boll weevil.

Plant Pathology and Physiology:

The Division of Plant Pathology and Physiology conducts researches relating to the diseases affecting the plants of the State, with a view to developing methods of combating them. Studies are made of the diseases of field crops, vegetables, trees, and ornamentals and shrubs of various kinds. Marked progress has been made in the study of cotton root rot.

Farm and Ranch Economics:

The Division of Farm and Ranch Economics makes studies of agricultural economic problems in the State. An economic study of a typical ranching area on the Edwards Plateau of Texas, involving 97 ranches in Sutton County, has been completed, and the results published in Bulletin 297.

An exhaustive economic study was made of the agriculture of Rockwall County. Schedules covering 503 frams, with 24 schedules for each farm, making a totaly of 12,072 different schedules, were taken in this study. The results are published in Bulletin 327.

Botany:

The Division of Botany has as its purpose the making of botanical surveys of both ranching and crop-farming sections of the State. These surveys will be closely correlated with the farm and ranch economics and soil surveys of the Station. A great deal is known of the cultivated plants which are adapted to our conditions, and the crops sequence in which they can be grown to best advantage, but there is little knowledge of this kind applicable to our wild flora, including grasses, weeds, brush, and other plants utilized for grazing. These changes in the wild flora are of utmost importance to the grazier.

Swine Husbandry:

The Division of Swine Husbandry conducts investigations and researches in the feeding, breeding, and management of swine. The swine husbandry plant is located on the grounds of the feeding and breeding substation near the the College Campus.

Dairy Husbandry:

The Division of Dairy Husbandry also has its plant on the feeding and breeding substation, where researches into the feeding, management, and improvement by breeding, of dairy cattle are being conducted.

Poultry Husbandry:

The Division of Poultry Husbandry is conducting investigations in connection with the feeding, breeding, and management of poultry, with special reference to the improvement of flocks by breeding, and increased egg-production through the judicious use of animal and vegetable pretein feeding stuffs. The poultry plant, like those of the Divisions of Swine and Dairy Husbandry, is located on the grounds of the feeding and breeding substation, near the College Campus.

Rural Home Research:

The Station System received during the past year the first installment of the Purnell Fund, provided by the Federal government, which amounts to $20,000.00 for the first year. This fund will increase at the rate of $10,000.00 a year until a mamimum of $60,000.00 a year is reached. It is intended for the support of existing lines of research, and such economic, sociological, and rural home researches as will bring improvement to rural industry and rural life. It is planned to develop a Division of Rural Home Research on the staff, with a thoroughly competent research woman as Chief, to look after all projects which have a bearing upon rural home problems.

State Apicultural Research Laboratory:

The great need for a specially equipped laboratory for the conduct of appropriate beekeeping investigations has been met by the State Apicultural Research Laboratory, which is located near San Antonio, in Bexar County. This laboratory, which is completely equipped, is in charge of a competent queen breeder, is conducting researches bearing directly on the successful continuation of the beekeeping industry of the State. In addition to this Laboratory and a queen-yard near San Antonio, beekeeping outyards are maintained at Roxton, in Larmar County; Dilley, in Frio County; and at Seguin, in Gaudalupe County.

Main Station Farm:

The Main Station Farm at College Station is operated as a field laboratory for the conduct of tests of field crops and the researches having to do with soil fertility as well as those having to do with the introduction and propagation of valuable trees, shrubs, and grasses. Special attention is being given to the cotton breeding work, which is conducted by the Division of Agronomy on this Farm. There is on the Farm a modern gin-plant primarily for the ginning of the increase cottons for pure seed, but neighboring farmers have taken advantage of this gin-plant to have their increase seed ginned without danger of mixture with other non-pure cotton seed.

SUBSTATIONS.

The fifteen substations, or experiment farms, owned and operated by the Station System, are, as their name implies, subordinate to and a part of the Main Station. In the location of these substations, due regard has been given to the

need of outlying work within the several agricultural regions of the State, and the principle lines of work are closely related to the problems peculiar to the region involved.

Cooperation With the School of Agriculture

Under the terms of a memorandum of understanding between the School of Agriculture and the Station, a number of teachers in the School of Agriculture are carrying cooperative projects of research on the Station. and certain research workers from time to time lecture to classes in the School of Agriculture.

Cooperation With the Graduate School

In cooperation with the Graduate School members of the Agricultural Experiment Station Staff offer the following graduate courses, which are described under the respective departments of instruction.

Agricultural Economics 571, 572. Agricultural Experiment Station Methods of Research. (2-4).

Agricultural Economics 573, 574. Research in Ranch Economics. (2-4).

Agronomy 571, 572. Research in Cotton Breeding.

Animal Husbandry 571, 572. Wool and Mohair Research. (3-4).

Animal Husbandry 573, 574. Research in Animal Breeding.

Biology 571, 572. Research in the Physiology of the Cotton Plant. (2-4).

Chemistry 571, 572. Special Topics in the Chemistry of Animal Nutrition. (2-6).

Chemistry 573, 574. Special Topics in the Chemistry of Animal Nutrition. (2-6).

PUBLICATIONS.

The reports, bulletins, and circulars issued by the Station System are distributed to the farmer and stockmen citizens of Texas free for the asking. Because of limited funds available for printing, it is necessary to practice strict economy in the distribution of these publications. All requests for bulletins, circulars, and reports should be directed to the following address.

The Director,
Texas Agricultural Experiment Station,
A. and M. College of Texas,
College Station, Texas.

THE ENGINEERING EXPERIMENT STATION

F. C. BOLTON, Director.

The Texas Engineering Experiment Station is composed of all the engineering departments of the College, and was organized in 1914 for the purpose of affording a service to the industries of Texas similiar to that afforded to the agricultural interests by the Agricultural Experiment Station; of assisting the urban population of the State in solving the technical problems of urban life; of investigating engineering and industrial problems of especial importance to Texas; and of disseminating information along these lines.

The Texas Engineering Experiment Station staff consists of the entire teaching force of the following departments of the College:

Agricultural Engineering.
Architecture.
Chemical Engineering.
Civil Engineering.
Economics.
Electrical Engineering.
Geology.
Mechanical Engineering.
Municipal and Sanitary Engineering.
Physics.
Textile Engineering.

Thirty bulletins have been issued relating to appropriate problems. These bulletins are distributed free, except in a few cases where the supply has become exhausted. For a list of these bulletins or further information address the Director.

THE EXTENSION SERVICE

CHAS. H. ALVORD, Director.

Extension work in agriculture and home economics by the Agricultural and Mechanical College in co-operation with the United States Department of Agriculture was established under the terms of the Smith-Lever Act, the Texas Legislature formally accepting the terms of the Federal Act passed in May, 1914. The Board of Directors and the President of the College executed the first co-operative agreement under its terms with the States' Relations Service of the United States Department of Agriculture in 1914.

The general purpose is to carry information relating to agricultural and home economics from the College, the experimental stations and other authentic sources to farmers, farm women, farm boys and girls and by practical demonstrations teach them how to apply this information to the solution of their problems. In addition to the regular State and Federal Smith-Lever funds that are available for the conduct of the work, several co-operative projects are maintained by the United States Department of Agriculture under co-operative agreement between the College and department, these activities being correlated with and functioned through the Extension Service of the College. Besides the important undertakings of farm and home demonstration work through county agents, sustained jointly by the county, the College and the Department of Agriculture, the service disseminates information by demonstrators given by specialists in counties having no county agents and through bulletins and other printed material prepared and sent out from the institution. The demonstrations and the information sent out cover every phase of better farming and home making and promote improvement in rural welfare. The funds available from the counties , the State and the Federal Department have been sufficient to enable the College to maintain county agents in practically all of the more important agricultural counties in the State. The condition under which work is placed in a county is, that the county commissioners court or other local organization pay from one-half to two-thirds of the salary of the agent; the remaining portion of the salary and expenses being borne by the College and department.

FARM DEMONSTRATION WORK

The farm demonstration work is conducted by district and county agents, and consists of applying scientific principles to the solution of the problems of production and marketing farm and ranch products.

HOME DEMONSTRATION WORK

The farm home is an essential part of the farm establishment, and the district and home demonstration agents are disseminating information to farm housewives through demonstrations, lectures, publications, in home management, dairying, gardening, orcharding, poultry keeping and other phases of home improvement; thus enabling the farm women to keep fully informed with reference to medern methods in dealing with household problems.

SPECIALISTS

In the growth and development of the work, trained specialists in certain phases of agricultural work have been found essential to the successful dissemination of information on improved agricultural practices. These men and women specialists keep in touch with the latest information obtainable regarding their particular specialty and assist the county and home demonstrations agents in the solution of difficult problems in their work requiring the services of specially trained men and women along certain lines, and compile information, answer correspondence, and emergency calls.

RURAL ORGANIZATION

The Extension Service, through its specialists, district and county agents, is encouraging rural organization in counties where agents are maintained, the purpose of these organizations being to stimulate co-operation among farmers in all matters of interest to farm families, and especially the co-operative handling of farm products through purchase and sale in such manner as to obtain the best returns.

BOYS' AND GIRLS' CLUBS

The primary mission of an educational institution is to look after the rising generation, and while the Extension Service would in no wise neglect the adult farmer, yet it has realized the importance of properly training the youth of the State during the formative period; therefore, special effort has been made under trained leadership and by diligent instruction to give the boys and girls the proper understanding of agriculture and home economics and to prepare them for successful and happy life in the country. The particular projects maintained are boys' agricultural and live stock club work, and girls' canning and poultry club work.

PUBLICATIONS

Seasonal advice on farm problems is issued through bulletins, leaflets, circulars, correspondence, newspaper articles, and the Semi-Monthly Extension Service Farm News, as well as correspondence and mimeographed letters and circulars.

SUMMER SESSION

The regular Summer Session consists of two terms of six weeks each. The 1926 Summer Session opens Monday, June 7, and closes Saturday, August 28. Students may enroll for the full session or for either term.

The purpose of the Summer Session is:

1. To provide teachers and others denied the privilege of attending College during the regular session an opportunity to pursue courses for college credit.

2. To give students of the College and others an opportunity to shorten their college course by doing summer school work.

3. To offer those qualified to pursue graduate work an opportunity for study in courses leading to the Master of Science degree.

4. To provide opportunity for professional improvement through short courses, of a highly specialized character, in certain trades and professions, as: Cotton classing; automobiles and tractors; a course for electric metermen; and a short course for graduate veterinarians.

Practically all departments of the College are open to students in the Summer Session. Detailed announcements of all the courses will be issued about the first of March. For further information and Summer School catalogue, address Director of Summer School, or The Registrar, College Station, Texas.

FERTILIZER CONTROL SERVICE

G. S. FRAPS, State Chemist.

The chemist of the Texas Experiment Station is designated by law as State Chemist, and has charge of the enforcement of the fertilizer law. Under his direction fertilizers are inspected, sampled for analysis, the samples analyzed, and the results published as bulletins of the Experiment Station. It is also the duty of the State Chemist to investigate the composition, properties, and agricultural values of fertilizers, and of fertilizer materials, and to conduct experiments relative to the value of fertilizers. Such investigations are being made, and the results published from time to time. The people of the State are furnished with information concerning fertilizers, by means of personal letters, bulletins, and otherwise. Co-operative fertilizer experiments are made with farmers, so that they can test the effects of various combinations of fertilizers on their own land.

Analyses are made of soils, irrigation and domestic waters, fertilizers, etc., when the analysis would be of public benefit along the lines of agricultural chemistry, and when the samples are taken in accordance with the requirements necessary to secure a suitable sample. Persons who desire to secure an analysis should request further information and instructions for sampling, as samples must be properly taken if the analysis is to have any value.

Analyses of feeding stuffs for the Feed Control Service, and chemical investgations of their composition and properties, are also made by the Division of Chemistry of the Experiment Station.

OFFICE OF STATE ENTOMOLOGIST

F. L. THOMAS, State Entomologist

By act of the Legislature the entomologist of the Texas Agricultural Experiment Station is ex-officio State Entomologist and is charged with enforcing the law of the State relative to diseases of bees. Under this law the State Entomologist is empowered to issue such regulations as may be necessary to control, eradicate or prevent the introduction, spread or dissemination of diseases of honey bees, as far as may be possible. The regulations that have been issued prohibit the moving or shipping of bees and appliances capable of transmitting diseases from one county to another without proper authority. Apiaries where American foulbrood is found are placed under quarantine until declared free from disease. Keeping of bees in hives or boxes not possessing movable frames has been made unlawful in order to facilitate examination of colonies in the areas where disease occurs. Bees on combs must be accompanied by a proper certificate when shipped into this State.

Biennial reports on the work of the inspection service contain information on the recognition, control and eradication of bee diseases.

OFFICE OF STATE FORESTER

E. O. SIECKE, State Forester.

The Office of State Forester was established by an act of the Thirty-fourth Legislature. In accordance with the law the State Forester, under the administrative control of the Board of Directors, has direction of all forest interests and matters pertaining to forestry within the jurisdiction of the State. He is charged with the duty of enforcing all laws pertaining to the protection of forests and woodlands, preventing and extinguishing forest fires, collecting data relative to forest conditions, and co-operating with counties, towns, corporations and individuals in preparing plans for the protection, management and replacement of trees, wood lots and timber tracts. Under the forestry act the State is authorized to accept gifts of land to be used to demonstrate the practical utility of timber culture, water conservation and as refuges for game. The Board of Directors has the power to purchase lands in the name of the State, suitable chiefly for the protection of timber, as State Forests, using for such purposes any special appropriations or any surplus money not otherwise appropriated which may be standing to the credit of the State forestry fund. Action is now being taken to purchase the first State Forest area with a special appropriation made for that purpose.

For the current year $50,000.00 of State funds and $27,000.00 of Federal funds are available for carrying on the designated activities of the office. The personnel comprises five technical foresters and forty-one field men.

Part VI

REGISTER

SUMMARY OF ENROLLMENT, SESSION 1925-26

(June 1, 1925 to April 1, 1926)

Regular Session, 1925-26:

	Agr	AA	AgEng	LA	Sci	Arch	ChE	CE	EE	ME	TE	Tex	CM	VM	AE	IE	RE	Total
Graduate	10	9	....	....	5	....	....	8	6	3	....	....	....	....	4	....	2	47
Senior	59	57	9	3	4	13	16	34	44	30	6	....	....	5	5	25	3	313
Junior	70	70	5	9	9	25	17	38	69	42	19	....	....	4	3	13	10	402
Sophomore	41	77	7	24	19	37	22	65	104	58	22	5	26	2	1	7	12	529
Freshman	65	89	3	53	25	68	38	74	181	97	30	5	73	2	2	3	5	813
Special	16	9	....	14	13	....	....	5	1	2	3	....	1	....	1	....	....	66
	261	311	24	103	75	143	93	224	405	232	80	10	100	13	16	48	31	2170

Non-Collegiate Two-year Course in Agriculture	17
Extension Courses in Industrial Education	49
Total Regular Session	2236

Summer Session, 1925:	1. College	428
	2. Cotton Classing	111
	3. Auto Mechanics	33
	4. Electric Metermen	73
	5. Veterinarians' Course	55
	6. Federal Students	21
	7. Farmers' Short Course	2008
	Total Summer Session	2729
Grand Total, 1925-26		4965
	Less Names Repeated	320
Net Total, 1925-26		4645

SUMMARY OF ENROLLMENT, REGULAR SESSION 1925-26, BY STATES AND FOREIGN COUNTRIES

Texas	2083	Ohio	1
Arizona	1	Oklahoma	22
Arkansas	13	Tennessee	1
California	2	Washington, D. C.	1
Colorado	2	Honduras, C. A.	1
Florida	1	China	2
Illinois	1	Cuba	2
Kansas	1	India	4
Kentucky	1	Mesopotamia	2
Louisiana	18	Mexico	9
Mississippi	6	Colombia, S. A.	2
Missouri	4	Switzerland	2
New York	3	Syria	1
North Carolina	1		

Total 2187

DEGREES AND CERTIFICATES CONFERRED AT THE FORTY-NINTH ANNUAL COMMENCEMENT

JUNE 2, 1925

Master of Science

In Agriculture (7)

Kalachand Hashmatrai Advani
B. in Agr. Poona Agr. College, Bombay, 1922

Edwin Walker Fox
B. S., University of Nebraska, 1924

Fred Hale
B. S., A. and M. College of Texas, 1922

Charles Harold Mahoney
B. S., University of Arizona, 1923

Harry Forrest Morris
B. S., A. and M. College of Texas, 1924

Frank Marais duToit
B. S., Iowa State College, 1924

William Henry Warren
B. A., University of Texas, 1918

In Agricultural Administration (3)

Donald Clinton Bauder
B. A., University of Wisconsin. 1924

Thomas Clement Davis
B. S., A. and M. College of Texas, 1923

Newton Watt Jones
B. S., A. and M. College of Texas, 1923

In Chemical Engineering (1)

Vinayak Narayan Lokras
B. S., A. and M. College of Texas, 1924

In Civil Engineering (1)

Eugene Vierling Spence
B. S., A. and M. College of Texas, 1911

In Rural Education (1)

Printess Edgar Bellenger
A. B., Baylor University, 1917

Without Specification as to Course (5)

Charles Elbert Bairfield
B. S.. A. and M. College of Texas, 1923

Charles Horace Hamilton
B. A., Southern Methodist University, 1923

Van A. Little
B. A., Sam Houston State Teachers College, 1922

Ashley Robey
B. S., Texas Christian University, 1923

Elmer Gillam Smith
B. A., Amherst College, 1919

Bachelor of Science

In Agriculture (62)

Garland Ellis Abbey
David Ben Baxt
Henry Newton Bell, Jr.
Ion Maywood Bethel
Wilden Harden Caldwell
Melvin Walter Carlton
DeWitt Creveling, Jr.
Frank Iver Dahlberg
Lewis Dodson
Joe Ward Edwards
Abd El aziz Hassan El Nouty
Jack Eubanks Finks
Louis John Foester
Cecil Romard Fry
Mahon Barker Garry
Eugene Daniel Gilchrist
John Floyd Grace
Joy Marion Graham
Thaddeus Tisdale Grout
Hugh Kirkman Harris
Herman Kennedy Henry
Frederick Davenport Hermann
Walter Louis Hohn
Bernard Huey Hopkins
Paul Huey
Charles Basil Johnson
Johnnie Duard Johnston
Vernon Forest Jones
John A. Keathley
Victor Ruynan Kennedy
Otis Harold Kimball
Marlin Douglas Lewis
Allen Aubrey McKimmey
Joseph Henry Maloney
Eugene E. Marshall
Vernon Martin
Carl Getulius Matern
Frank Homer Moon
Leslie Stewart Moore
Phillip Myers
James Dupree Ogletree
William Bassett Orr
Bert R. Powell
Guy Moreland Powell
Benier Freeman Pye, Jr.
Richard Quayle
Tom Clarence Reitch
Rheutilious Fletcher Royal
Elmo Marconie Schaefer
Clarence Walter Shockley
Maurice Denton Stanford
Frank Marion Stubbs, Jr.
Lennie E. Sweatman
Harper Franklin Tickle
Charles Howard Valentine
William C. Weddell
Carlton Albert Williams
Cecil Calvert Wilson
Ray Wallace Wilson
John Lloyd Wright
William Augustus Wurzbach, Jr.
Lester Jones Young

In Agricultural Administration (24)

Hansel Turner Beckworth, Jr.
Charles Lawson Craig
Clifford Charles Davis
Marvin Edward Dealy
Arthur Lee Elliot
Vade Giles Forrester
Virgil Clark Glass
Jack James Grant
Jack Harper Hayes
Armstead Miller Hiatt, Jr.
Arthur Weber Huff
Zim Hunt
Billy Jarvis
Robert Lee Leuschner
Joseph Bernad Meitzen
James Authur Mowlam
Jerome August Muller
Stephen Austin Noble
Shields Norwood, Jr.
Joe Frank Peters
James Wesley Pyland
James Norman Tate
William Mounts Tompkins
Gaston Milling Wood

In Agriulcural Education (3)

Jesse Lee Owens
C. B. Fenner
William Henry Warren

In Agricultural Engineering (3)

Harry Davis Duckett
Carl William Moore
Robert Winston Wilson

In Architecture (17)

Sherwood Thomas Allen
Oliver C. Anderson
Victor Travis Arnim
John Cecil Ashford
Milton John Batot
Henry Clair Bennett
Dennie Herbert Cox
Archie Mayfield Damon
Sol Rheim Franck
Blum Elsworth Hester
Howard Richard Johnson
Vivtor LeMay
Edward Lochridge Rankin
Ralph Rodney Reynolds
Walter Thomas Short
Charles Marion Turney
Richard Joseph Werner

In Chemical Engineering (12)

Orville Ariel Brouer
Alsop Edward Flowers, Jr.
Venor Herbert Gohlke
Robert Dellar Hanley
John James Lee Hardman
John Alma Holder
Marshall Ray Howard
George Gilbert Hyland
John Madison Kindle
Joe Miller
Leslie Deane Stephenson
Richard Bradley Thacker, Jr.

In Civil Engineering (28)

Durward Belmonte Ashworth
James Bernard Baty
John Paul Burden
Robert Wesley Colglazier, Jr.
Eugene Benjamin Darby
Kenneth Edwin Davis
Elijah Julius DeuPree
George Saunders Fraps
William Richard Federick, Jr.
Estell L. Gibson
Lee Hardy Gripon
Addison Yancy Gunter
Homer A. Hunter
John Edward Jacobson
Edward Rowell McChesney
Albert Maverick McNeel
Staley Wood Mims
Sam Ab Nixon
Robert Kyle Owen
Dalton Lee Reid
Albert Darwin Schmid
Edwin Brazelton Snead
Chester W. Terry
John Andrew Waller
Clarence Reginald Wehrman
John Benjamin Woiton
Asa Upton Wright
Walter Charles Young, Jr.

In Electrical Engineering (20)

Edmond Ira Bailey
Daniel Grafton Bell
Elmore Frederick Berendt
Edwards Blevens
Graham Clay Buchanan
Kenneth Earl Engel
Junius Fishburne Estill, Jr.
Thomas Raymond Halsey
Robert Dittman Harrison
Allen Dale Howdeshell
George Spears Kerr
Milton Waldo Krause
Louis Gilbert Kuempel
Albert G. Pfaff
William Marshall Ransome
Millard Weaver Rice
Earley Milburn Shook
Alvis Andrew Ward
Lewis Marion Welch
Oscar Otto Zappe

In Industrial Education (11)

John Palmer Black, Jr.
Walter Scott Finch
Joseph Kerr Gibson
Ross Lee Groginsky
Theodore Cecil Hatfield
James Charles Larkin
Albert Burke Muller
Howard Burleson Simpson
Walter Franklin Trim
Walter Wilburn Turman
Wesley Dale Weaks

In Mechanical Engineering (28)

Robert O. Bartholomew
Leon Aldis Bickel
Isadore Bock
Jordan Lee Clarke
Robert Allison Crawford
James Harold Dunn
Cyrus Leroy Edwards
Victor Lovelace Ginn
Ralph Holmgreen Glenney
Rafael A. Gonzales
Herbert Francis Goodenuogh
Henry Volandis Goss
George Bradford Griffin
Samuel Benson Grissom
Wade Fentress Guion
Sy Yoakum Guthrie
Raymond Patrick Hallaran
Benjamin Preston Harper
John Frederick Hodge
Carl Mitchell Kunkel
Isadore Miller
Leo Goodwin Park
Alvin Ike Richardson
Charles T. Schwab, Jr.
Percy Hilton Smith, Jr.
Willie Ray Smith
Carl Milton Underwood
Charles Alden Waugh

In Rural Education (1)

W. Lee Hughes

In Textile Engineering (4)

Roland O. Cox
John Sears Earle
Charles Hal Jones, Jr.
Claude Albert Mast

Doctor of Verterinary Medicine (5)

Claude Canion
Wilmer Raymond McCullough
Raymon Lewis Rogers, Jr.
Macy Smotherman
Clarence Leroy Winchester

Certificate in Two-Year Course

In Agriculture (1)

Samuel Emmett McGregor

DEGREES CONFERRED IN THE 1925 SUMMER SESSION

(August 28, 1925)

Master of Science

In Agriculture (5)

Martin Marion Daugherty
B. S., A. and M. College of Texas, 1916

Jesse Neal Gearreald
B. S., A. and M. College of Texas, 1919

William Charles Homeyer
B. A., University of Texas, 1915
B. S., A. and M. College of Texas, 1921

David Thornton Killough
B. S., A. and M. College of Texas, 1914

Lucian Guy Rich
B. S., A. and M. College of Texas, 1914

Without Specification as to Course (2)

Pennoyer F. English
B. S., Oregon Agricultural College, 1919

Joseph B. Oliphint
B. S., A. and M. College of Texas, 1923

Bachelor of Arts

In Liberal Arts (1)

Mary Evelyn Crawford

Bachelor of Science

In Agriculture (1)

Clifford F. Freeman

In Agricultural Administration (5)

Benjamin B. Banks
Hayden Samuel Barlow
Wolford Lowell Gurinsky
Frank Messenger
James Bryant Walker

In Agricultural Education (3)

William Milton Gourley
Hugh Robinson McNiel
James C. Shoultz

In Architecture (1)

Dick Perry

In Electrical Engineering (1)
Lloyd Thomas Williams

In Industrial Education (6)

Raymond Crosby Armstrong
Will Bailey Erwin
Ward Poole Lambert
Fred William Moore
Chester Lee Morgan
Malcolm Thomas Swann

DEGREES CONFERRED JANUARY 29, 1926

Master of Science

Without Specification as to Course (1)
Clifford Symes Rude
B. S.. Kansas State Agricultural College, 1919

Bachelor of Science

In Agriculture (1)
Thomas G. Barnes

In Agricultural Administration (4)

Heber Rieves Allen
David Otho Davis
John F. Burton Lyons
Marvin Henry Remschel

In Agricultural Eductation (1)
Ralph Horace Gay

In Agricultural Engineering (1)
Wilbur Horace Greenstreet

In Civil Engineering (3)

Harry de Ponta Bone
John W. Galbraith
George Davis Williams

In Industrial Education (1)
William Angus Moore

In Mechanical Engineering (1)
Kenneth William Irwin

Doctor of Veterinary Medicine (1)
Patton Wright Burns

SUMMARY OF DEGREES CONFERRED

(June 2, 1925 to January 29, 1926)

Advanced:		
	Master of Science	26
Baccalaureate Degrees:		
	Bachelor of Arts: In Liberal Arts	1
	Bachelor of Science: In Agriculture	64
	In Agricultural Administration	33
	In Agricultural Education	7
	In Agricultural Engineering	4
	In Architecture	18
	In Chemical Engineering	12
	In Civil Engineering	31
	In Electrical Engineering	21
	In Industrial Education	18
	In Mechanical Engineering	29
	In Rural Education	1
	In Textile Engineering	4
	Doctor of Veterinary Medicine	6
	Total	275

ORGANIZATION OF THE ASSOCIATION OF FORMER STUDENTS

L. L. Ballard ..... President

A. L. Ward ..... Vice-President

Carlton Meredith ..... Vive-President

W. A. Orth ..... Vice-President

Ike Ashburn ..... Secretary

DISTINGUISHED STUDENTS

(SESSION 1924-25)

At the end of each session, students who have failed in no subject and who have accumulated a total of at least sixty grade points during the session shall be designated as "Distinguished."

Freshman Class

Alexander, T. M.
Babcock, R. M.
Boyd, W. G.
Broesche, J. H.
Brown, B. P.
Brown, J. T.
Cardwell, L. H.
Cavitt, S. E.
DeBardeleben, J. M.
Elkins, C. H.
Fraps, Mary
Frost, S. C.
Furneaux, J. L.
Honnel, P. M.
Love, W. F.
Neff, J.
Skinner, L.
Thalmann, V. W.
Walton, Ethyl
Wick, R. F.
Wylie, H. P.

Sophomore Class

Burks, D.
Carlson, O. G.
Chambers, B. R.
Donges, N. A.
Lee, W. L.
Martin, J. M.
Montgomery, W. N.
Norton, P. T.
Opryshek, C.
Pilkey, O. H.
Pink, J. L.
Smith, F. M.
Tinus, W. C.
Umlang, E. E.
Youngs, G. A.

Junior Class

Adair, G. P.
Bayless, A.
Bernadoni, B.
Blair, R. M.
Boriskie, P.
Bossy, R. A.
Cooper, H. P.
Eppright, G. J.
Giesecke, A. H.
Jensen, J. G.
Johnson, C.
Jones, J. D.
Kennedy, R. M.
Liebhafsky, H. A.
Lipsocmb, E. W.
McCarty, O. P.
Muenzenberger, C.
McInnis, Malcolm
Mallony, J. S.
Parr, V. P.
Peterson, C. J.
Peterson, H. L.
Phillips, W. L.
Quereau, C. H.
Walker, J. B.
Wilson, H. D.

Senior Class

Abbey, G. E.
Allen, S. T.
Bell, D. G.
Buchanan, G. C.
Cox, D. H.
Damon, A. M.
Estill, J. F.
Gibson, E. L.
Gunter, A. Y.
Hanley, R. D.
Hester, B. E.
Owens, J. L.
Rankin, E. L.
Reynolds, R. R.
Short, W. T.
Werner, R. J.
Williams, C. A.
Wright, J. L.
Youngs, W. C.

INDEX

INDEX—Continued