OFFICIAL PUBLICATION
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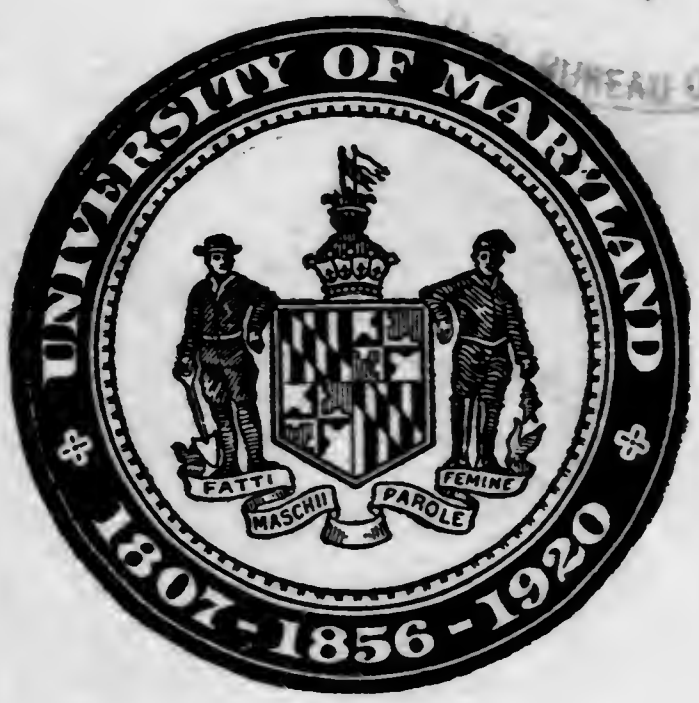
# University of Maryland

Vol. 17 JULY, 1920 No. 1

# CATALOGUE

*1920—1921*






Containing general information concerning the University, Announcements for the Scholastic Year 1920-1921, and Records of 1919-1920

Issued monthly by the University of Maryland, at College Park, Md., as second-class matter, under Act of Congress of July 16, 1894.

# THE UNIVERSITY OF MARYLAND

## CATALOGUE

### 1920—1921

Containing general information concerning the University Announcements for the Scholastic Year 1920-1921, and Records of 1919-1920.

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# CALENDAR 1920, 1921, 1922

## 1920

### JULY

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# UNIVERSITY CALENDAR 1920-1921

## FIRST TERM

| | |
|---|---|
| Sept. 20–21, Monday–Tuesday. | Entrance and condition examinations. Registration days for old and new students. |
| Sept. 22, Wednesday | 11:15 a. m. Assembly of student body; President's annual address. 1:20 p. m. All classes begin. |
| Sept. 24, Friday | President's reception for new students and presentation of Freshman Code. |
| Sept. 29, Wednesday | Last day for change of registration without fee; last day to register without payment of late registration fee. |
| Nov. 12, Second Friday in November | Freshman entertainment night. |
| Nov. 24, Wednesday, 12 m. | Thanksgiving recess begins. |
| Nov. 30, Tuesday, 8 a. m. | Thanksgiving recess ends. |
| Dec. 3, Second Friday after Thanksgiving | Football Dance. |
| Dec. 10, Friday | Presentation by Dramatic Club. |
| Dec. 15–22 | Registration for second term. |
| Dec. 22, Wednesday, 11 a. m. | First term ends. Christmas vacation begins. |

## SECOND TERM

| | |
|---|---|
| Jan. 4, Tuesday, 8 a. m. | Christmas vacation ends. Instruction for second term begins. |
| Jan. 11, Tuesday | Last day to change registration without fee and last day to register without late registration fee. |
| Feb. 4, First Friday in February | Intersociety debate. |
| Feb. 22, Tuesday | Washington's Birthday. |

| | |
|---|---|
| March 3, Thursday | Intercollegiate debate. |
| March 4, Friday | Inauguration Day. Holiday. |
| March 16–22 | Registration for third term. |
| March 23, Wednesday, 12 m. | Second term ends. Easter recess begins. |

## THIRD TERM

| | |
|---|---|
| March 29, Tuesday, 8 a. m. | Easter recess ends. Third term begins. All classes meet at scheduled time. |
| April 29, Last Friday in April | Annual contest of the Oratorical Association of Maryland colleges. |
| May 14, Saturday | All required theses must be presented. |
| May 21, Third Friday in May | May Ball. |
| May 30, Decoration Day | Farmers' Day. |
| June 3, Friday | Presentation by Dramatic Club. |
| June 6–10 | Registration for first term 1921–1922. |
| June 11, Saturday | Student Organizations' Day. |
| June 12, Sunday | Beginning Commencement Exercises. Baccalaureate Sermon. |
| June 13, Monday | Class Day. |
| June 14, Tuesday | Alumni Day. |
| June 14, Tuesday, 9 p. m.–1 a m. | Commencement Ball. |
| June 15, Wednesday | Commencement Day. |

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Mt. Victoria, Charles County

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Union Trust Co., Baltimore

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JOHN E. RAINE.....Term expires 1921
413 E. Baltimore St., Baltimore

CHARLES C. GELDER.....Term expires 1929
Princess Anne, Somerset County

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Kensington, Montgomery County

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HENRY HOLZAPFEL.....Term expires 1926
Hagerstown, Washington County

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ROBERT CRAIN
DR. W. W. SKINNER

**Experiment Station and Investigational Work:**

B. JOHN BLACK, *Chairman*
DR. W. W. SKINNER
HENRY HOLZAPFEL, JR.

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JOHN E. RAINE

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Assistant to the President.

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Dean of the College of Agriculture.

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Dean of the School of Engineering.

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Dean of the School of Liberal Arts.

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Dean of the School of Medicine.

HENRY D. HARLAN, L.L. D.
Dean of the School of Law.

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Dean of the School of Pharmacy.

T. O. HEATWOLE, M. D., D.D. S.
Dean of the School of Dentistry.

H. F. COTTERMAN, M. S.
Dean of the School of Education.

H. B. McDONNELL, M. S., M. D.
Dean of the School of Chemistry.

M. MARIE MOUNT, A. B.
Acting Dean of the School of Home Economics.

C. O. APPLEMAN, Ph. D.
Dean of the Graduate School.

H. J. PATTERSON, D. Sc.
Director of the Agricultural Experiment Station.

THOMAS B. SYMONS, M. S., D. Agr.
Director of the Extension Service.

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*Absent on leave for government work in China.

## THE EDUCATIONAL UNITS

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**THE SCHOOL OF ENGINEERING.**
T. H. TALIAFERRO, C. E., Ph. D., Dean.

**THE SCHOOL OF LIBERAL ARTS.**
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**THE SCHOOL OF MEDICINE.**
J. M. H. ROWLAND, M. D., Dean.

**THE LAW SCHOOL.**
HENRY D. HARLAN, L.L. D., Dean.

**SCHOOL OF DENTISTRY.**
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**SCHOOL OF PHARMACY.**
E. F. KELLY, Phar. D., Dean.

**THE SCHOOL OF EDUCATION.**
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**THE SCHOOL OF HOME ECONOMICS.**
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**THE GRADUATE SCHOOL.**
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**THE DEPARTMENT OF PHYSICAL EDUCATION AND RECREATION.**
H. C. BYRD, B. S., Director.

**THE SUMMER SCHOOL.**
H. F. COTTERMAN, Director.

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*The order of the following names is that of seniority of office:*

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CHARLES S. RICHARDSON, M. A., Professor of Public Speaking and Extension Education.

HARRY GWINNER, M. E., Professor of Mechanical Engineering and Drawing, Superintendent of Shops.

T. H. TALIAFERRO, Ph. D., C. E., Professor of Civil Engineering and Mathematics, Dean of School of Engineering.

MYRON CREESE, B. S., E. E., Professor of Electrical Engineering and Physics.

E. N. CORY, M. S., Professor of Zoology, State Entomologist.

C. O. APPLEMAN, Ph. D., Professor of Plant Physiology, Dean of Graduate School.

L. B. BROUGHTON, M. S., Professor of General Chemistry.

H. C. BYRD, B. S., Assistant to the President and Director of Athletics.

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P. I. REED, M. A., Ph. D., Professor of the English Language and Literature.

A. G. McCALL, Ph. D., Professor of Geology and Soils.

R. C. REED, Ph. B., D. V. M., Professor of Animal Pathology, Dean of Division of Animal Industry.

H. F. COTTERMAN, B. S., M. A., Professor of Agricultural Education, Dean of School of Education.

J. A. GAMBLE, M. S., Professor of Dairy Husbandry.

E. M. PICKENS, D. V. S., M. S., Professor of Bacteriology and Animal Pathologist of the Biological and Live Stock Sanitary Laboratory.

DeVOE MEADE, Ph. D., Professor of Animal Husbandry.

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M. MARIE MOUNT, B. A., Professor of Home and Institutional Management, Acting Dean of School of Home Economics.

E. B. McNAUGHTON, B. S., Professor of Home Economics Education.

R. WELLINGTON, M. S., Professor of Vegetable Gardening.

N. M. PROFFITT, Ph. B., Professor of Trade and Industrial Education.

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T. B. THOMPSON, Ph. D., Professor of Economics.

CAPT. GEORGE A. MATILE, U. S. A., Professor of Military Science and Tactics.

E. S. JOHNSTON, Ph. D., Associate Professor of Plant Physiology.

S. S. STEINBERG, B. E., C. E., Associate Professor of Civil Engineering.

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C. F. KRAMER, M. A., Assistant Professor of Modern Language.

J. T. SPANN, B. S., Assistant Professor of Mathematics.

R. C. WILEY, B. S., Assistant Professor of Chemistry.

W. R. BALLARD, B. S., Assistant Professor of Pomology.

H. W. STINSON, B. S., Assistant Professor of Modern Languages.

H. B. HOSHALL, B. S., Assistant Professor of Mechanical Engineering.

A. S. THURSTON, M. S., Assistant Professor of Vegetable Gardening and Floriculture.

FRIEDA M. WIEGAND, B. A., Assistant Professor of Textiles and Clothing.

M. F. WELSH, D. V. M., Assistant Professor of Animal Pathology and Bacteriology.

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F. W. BESLEY, B. A., Sc. D., Lecturer in Forestry, State Forester.

M. A. PYLE, B. S., Instructor in Engineering.

W. A. GRIFFITH, M. D., Instructor in Hygiene, College Physician.

MILTANNA ROWE, Instructor in Library Science, Librarian.

MRS. JANET THURSTON, Ph. B., Instructor in Textiles and Clothing, Foods and Cookery.

J. B. BLANDFORD, Instructor in Horticulture, Horticultural Superintendent.

R. V. TRUITT, B. S., Assistant in Entomology.

SGT. M. McMANUS, Assistant in Military Science and Tactics.

F. D. DAY, B. S., Assistant in Agricultural Education.

NOTE.—Faculties of the Schools of Medicine and Law and of the Schools of Pharmacy and Dentistry are given with the other information about those organizations.

## AGRICULTURAL EXPERIMENT STATION STAFF

| | | |
|---|---|---|
| HARRY J. PATTERSON | | Director and Chemist. |
| J. B. S. NORTON | | Botany and Plant Pathology. |
| THOS. H. WHITE | | Vegetable and Floriculture. |
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| ROY H. WAITE | | Poultry. |
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| E. N. CORY | | Entomology. |
| A. G. McCALL | | Soils. |
| J. E. METZGER | | Agronomy. |
| E. M. PICKENS | | Animal Pathology. |
| E. C. AUCHTER | | Pomology. |
| ALBERT WHITE | | Supt. Ridgely Farm. |
| F. S. HOLMES | | Seed Inspection. |
| R. WELLINGTON | | Vegetable Breeding. |
| C. E. TEMPLE | Associate | Plant Pathology. |
| E. S. JOHNSTON | " | Plant Physiology. |
| O. C. BRUCE | " | Soil Survey. |
| A. M. SMITH | " | Soils. |
| R. S. ALLEN | Assistant, | Swine Husbandry. |
| R. C. TOWLES | " | Animal Husbandry. |
| GEO. R. STUNTZ | " | Agronomy. |
| J. P. JONES | " | Plant Physiology. |
| E. V. MILLER | " | Plant Physiology. |
| C. B. NICKELS | " | Entomology. |
| H. B. WINANT | " | Soils. |
| J. ROY HAAG | " | Soils. |
| E. H. PARFITT | " | Biochemistry. |
| C. C. CHEN | " | Plant Pathology. |
| C. C. HAMILTON | " | Entomology. |
| ANNA M. HOOK | " | Seed Inspection. |
| CLARA M. HODGINS | " | " " |
| CAROLINE VEITCH | " | " " |

# EXTENSION SERVICE STAFF

*THOMAS B. SYMONS, M. S., D. Agr., Director.
*F. B. BOMBERGER, B. S., A. M., D. S. C., Assistant Director and Specialist in Rural Organization and Marketing.
*T. E. McLAUGHLIN, B. S., District Agent and Specialist in Animal Industry.
*S. S. BUCKLEY, M. S., D. V. S., Specialist in Animal Husbandry.
*G. E. WOLCOTT, B. S., Specialist in Dairying.
S. B. SHAW, B. S., Specialist in Horticulture.
F. W. OLDENBURG, B. S., Specialist in Agronomy.
E. N. CORY, M. S., Specialist in Entomology.
C. E. TEMPLE, M. S., Specialist in Pathology.
H. W. RICKEY, Specialist in Poultry Husbandry.
C. L. OPPERMAN, Agricultural Editor.
E. C. AUCHTER, M. S., Specialist in Horticulture.
C. S. RICHARDSON, A. B., Specialist in Educational Extension.
*VENIA M. KELLAR, B. S., State Home Demonstration Agent.
R. W. WELLINGTON, M. S., Specialist in Vegetable Gardening.
C. B. NICKELS, B. S., Fellowship Assistant in Entomology.
*MARGARET SCHMIDT, B. S., *MABEL L. STEPHENSON, *OLA M. DAY
(District Agents in Home Demonstration Work.)
*ADICE S. JONES, Specialist in Girls' Club WORK.
*E. G. JENKINS, State Boys' Club Agent.
*PETER CHICHESTER, Assistant Boys' Club Agent.

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| *J. P. BURDETTE, A. B | Charles | La Plata |
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| *G. F. WATHEN, Jr | St. Mary's | Loveville |
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| *S. E. DAY, B. S | Washington | Hagerstown |
| *G. R. COBB, B. S | Wicomico | Salisbury |
| *E. I. OSWALD, B. S | Worcester | Snow Hill |
| *L. H. MARTIN (colored) | Eastern Shore | Princess Anne |
| *J. F. ARMSTRONG (colored) | Southern Maryland | Seat Pleasant |

*In cooperation with the U. S. Dept. of Agriculture.

## COUNTY HOME DEMONSTRATION AGENTS.

| | | |
|---|---|---|
| *(Miss) RHEA MORGAN | Allegany | Cumberland |
| *(Mrs. ) GEORGIANA LINTHICUM | Anne Arundel | Annapolis |
| *(Miss) BERTHA IDE | Baltimore | Baltimore City |
| *(Mrs. ) EDITH G. NORMAN, B. S | Caroline | Denton |
| *(Miss) RACHEL EVERETT | Carroll | Westminster |
| *(Miss) ESTHER WOTRING, B. S | Cecil | Elkton |
| *(Miss) JULIA ETCHISON, B. S | Charles | La Plata |
| *(Miss) FRANCES G. STUART | Dorchester | Cambridge |
| *(Miss) BLANCHE GITTINGER, B. S | Harford | Bel Air |
| *(Mrs. ) NELL C. LAWSON | Howard | Ellicott City |
| *(Miss) SUSAN V. HILL | Kent | Chestertown |
| *(Miss) CATHERINE COWSILL | Montgomery | Rockville |
| *(Miss) ELLEN DAVIS | Prince George | Upper Marlboro |
| *(Miss) MARY BYRN | Queen Anne's | Centerville |
| *(Miss) M. LOUISE MILLS | Somerset | Princess Anne |
| *(Miss) KATHERINE MURRIN | St. Mary's | Leonardtown |
| *(Mrs. ) OLIVE K. WALLS | Talbot | Easton |
| *(Miss) SUE W. FRICK | Washington | Hagerstown |
| *(Miss) OLIVE C. MITCHELL | Wicomico | Salisbury |
| *(Miss) LUCY J. WALTER | Worcester | Snow Hill |
| *(Miss) LEAH D. WOODSON (colored) | Charles & St. Mary's | La Plata |

## CITY WORKERS.

Baltimore City.....MRS. ADELAIDE DERRINGER.
Baltimore City.....MISS GWYNNETH GMINDER.

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*In cooperation with the U. S. Dept. of Agriculture.

## STATE HORTICULTURAL DEPARTMENT

*THOMAS B. SYMONS, Director.
E. N. CORY, State Entomologist.
C. E. TEMPLE, State Pathologist.
W. C. TRAVERS, Inspector.

## STATE FERTILIZER WORK

H. B. McDONNELL,
State Chemist.

L. B. BROUGHTON,
Assistant Chemist.

NEIL H. GORDON,
Assistant Chemist.

R. C. WILEY,
Assistant Chemist.

L. H. VANWORMER,
Assistant Chemist.

C. F. BLETSCH,
Assistant Chemist.

R. H. WALLS,
Assistant Chemist.

A. D. ETIENNE,
Assistant Chemist.

J. S. WHITBY,
Inspector.

CHARLES T. DAY,
Inspector.

J. S. SCARBOROUGH,
Inspector.

## LIVE STOCK SANITATION

R. C. REED.....Chief, Animal Industry.
J. B. GEORGE.....Secretary.
E. M. PICKENS.....Pathologist, Live Stock Sanitary and Biologica Laboratory.
_____.....Assistant.
D. R. HOFFMAN.....Veterinarian in Charge of Stock Yards.
G. H. GRAPP.....Veterinary Inspector.
*I. K. ATHERTON.....Inspector in Charge Hog Cholera Control.

## FARM MANAGEMENT

G. A. BILLINGS.....Farm Management Investigator.

*In cooperation with the U. S. Dept. of Agriculture.

# FACULTY COMMITTEES FOR 1920-1921

## ALUMNI.

MESSRS. CORY, BROUGHTON, BYRD, HOSHALL, STINSON, HILLEGEIST.

## BUILDINGS.

MESSRS. CRISP, GWINNER, CREESE and PIERSON.

## CATALOGUE, STUDENT ENROLLMENT AND ENTRANCE.

MESSRS. ZIMMERMAN, BYRD, SPENCE, COTTERMAN, CREESE, P. I. REED, BROUGHTON, HILLEGEIST and APPLEMAN.

## UNIVERSITY PUBLICATIONS.

MESSRS. PATTERSON, BYRD, BOWERS, McDONNELL, RICHARDSON and SYMONS.

## COURSES OF STUDY.

MESSRS. COTTERMAN, R. C. REED, McDONNELL, SPENCE, ZIMMERMAN, T. H. TALIAFERRO, HILLEGEIST, MATILE and MISS WIEGAND.

## GROUNDS AND ROADS.

MESSRS. AUCHTER, THURSTON, CRISP, PATTERSON, STEINBERG and STUNTZ.

## COMMENCEMENT.

MESSRS. T. H. TALIAFERRO, RICHARDSON, CORY, SPENCE, P. I. REED and MATILE.

## SANITATION.

MESSRS. PICKENS, GRIFFITH, McDONNELL, W. T. L. TALIAFERRO, CORY, PYLE and MISS MOUNT.

## STUDENT AFFAIRS.

MESSRS. BYRD, CORY, BROUGHTON, SCHULZ, BOMBERGER and CLASS PRESIDENTS.

## STUDENT PUBLICATIONS.

MESSRS. P. I. REED, BYRD, BOWERS and GAMBLE.

## FARMERS' DAY.

MESSRS. PATTERSON, SYMONS and ZIMMERMAN.

NOTE.—These faculty committees apply only to the group of schools at College Park.

## GRADUATE COUNCIL

ALBERT F. WOODS, M. A., D. Agr., President.

C. O. APPLEMAN, Dean of the Graduate School, Chairman, ex-officio.

E. S. JOHNSTON, Secretary.

DIRECTOR PATTERSON, PROFESSORS TALIAFERRO, CORY, REED, McCALL, MEADE and GORDON.

## ADMINISTRATIVE OFFICERS

ALBERT F. WOODS, A. M., D. Agr., President.

H. C. BYRD, B. S., Assistant to the President.

MAUDE F. McKENNEY, Financial Secretary.

W. M. HILLEGEIST, Registrar.

ARTHUR M. SHIPLEY, M. D., Superintendent of Hospitals.

H. L. CRISP, M. M. E., Superintendent of Buildings.

MILTANNA ROWE, Librarian.

# GENERAL INFORMATION

# THE UNIVERSITY OF MARYLAND

## Location

The University of Maryland is located at College Park in Prince George's County, Maryland, on the line of the Washington branch of the Baltimore and Ohio Railroad, eight miles from Washington and thirty-two miles from Baltimore. At least eight trains a day from each city stop at College station, thus making the place easily accessible from all parts of the State. Telephone connection is made with the Chesapeake and Potomac lines.

The grounds front on the Baltimore and Washington Boulevard. The suburban town of Hyattsville is two miles to the south, and Laurel, the largest town in the county, is ten miles to the north on the same road. Access to these towns and to Washington may be had by steam and electric railway. The site of the University is particularly beautiful. The buildings occupy the crest of a commanding hill, which is covered with forest trees and overlooks the entire surrounding country. In front, extending to the boulevard, is a broad rolling campus, the drill ground and athletic field. A quarter of a mile to the northeast are the buildings of the Agricultural Experiment Station. The farm of the College of Agriculture contains about 300 acres, and is devoted to fields, gardens, orchards, vineyard, poultry yards, etc., used for experimental purposes and demonstration work in agriculture and horticulture.

The general appearance of the grounds is exceedingly attractive. They are tastefully laid off in lawns and terraces which are ornamented with shrubbery and flower beds. The view from the grove and campus cannot be surpassed.

The location of the University is healthful; the sanitary conditions are excellent. No better proof of this can be given than that there has been practically no serious case of illness among the students for many years.

The Schools of Medicine, Pharmacy, Dentistry, and Law of the University are located in Baltimore at the corner of Lombard and Greene Streets.

## History

The history of the present University of Maryland practically combines the histories of two institutions. It begins with the chartering of the College of Medicine of Maryland in Baltimore in 1807, which graduated its first class in 1810. In 1812 the institution was empowered to annex other departments and was by the same act "constituted an University by the name and under the title of the University of Maryland."

As such, its Law and Medical schools have since been especially prominent in the South and widely known throughout the country. The Medical School building in Baltimore, located at Lombard and Greene Streets, erected in 1814-1815 is the oldest structure in America devoted to medical teaching.

For more than a century the University of Maryland stood almost as organized in 1812, until an act of the last Legislature merged it with the Maryland State College, and changed the name of the Maryland State College to the University of Maryland. All the property formerly held by the old University of Maryland was turned over to the Board of Trustees of the Maryland State College, and the Board of Trustees will hereafter be known as the Board of Regents.

The Maryland State College first was chartered in 1856 under the name of the Maryland Agricultural College, the second agricultural college in the Western Hemisphere. For three years the College was under private management. In 1862 the Congress of the United States, recognizing the practical value and increasing need of such colleges, passed the Land Grant Act. This act granted each State and Territory that should claim its benefits a proportionate amount of unclaimed Western lands, in place of scrip, the proceeds from the sale of which should apply under certain conditions to the "endowment, support and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." This grant was accepted by the General Assembly of Maryland. The Maryland Agricultural College was named as the beneficiary of the grant. Thus the College became, at least in part, a State institution. In the fall of 1914 its control was taken over entirely by the State. In 1916 the General Assembly granted a new charter to the College and made it the Maryland State College.

Under the new charter, which this year makes it a university, the institution is co-educational. Every power is granted necessary to develop an institution of higher learning and research, comparable to the great state universities of the West, in which Agriculture and Engineering hold a dominant place along with the Liberal Arts and professions. This is in full accord with the Morrill Act of the National Congress and the subsequent acts above referred to. This institution, therefore, becomes the representative of the State and the Nation in higher education and research. The charter provides that it shall receive and administer all existing grants from the national government and all future grants which may come to the State for this purpose.

# EXTENSION AND RESEARCH

## Agriculture and Home Economics

The agricultural and home economics extension service of the University, in co-operation with the United States Department of Agriculture, carries to the people of the State through practical demonstrations conducted by specialists of the College of Agriculture and county agents, the results of investigations in the fields of Agriculture and Home Economics. The organization consists of the administrative forces, including the director, assistant director, specialists and clerical force, the county agricultural demonstration agents, and the home demonstration agents in each county and in the chief cities of the State. The county agents and the specialists jointly carry on practical demonstrations under the several projects in the production of crops or in home-making, with the view of putting into practice on the farms of the State improved methods of Agriculture and Home Economics that have stood the test of investigation, experimentation, and experience. Movable schools are held in the several counties. At such schools the specialists discuss phases of Agriculture and Home Economics in which the people of the respective counties are specially interested.

The work of the Boys' Agricultural Clubs is of especial importance from an educational point of view. The specialists in charge of these projects, in co-operation with the county agricultural agents and the county school officers and teachers, organize the boys of the several communities of the county into agricultural clubs for the purpose of teaching them by actual practice the principles underlying agriculture. The boys hold regular meetings for the discussion of problems connected with their several projects and for the comparison of experiences. Prizes are offered for the stimulation of interest in the work.

The Home Economics specialists and agents organize the girls into clubs for the purpose of instructing them in the principles underlying canning, drying, preserving of fruits and vegetables, cooking, dressmaking and other forms of Home Economics work.

Educational value of the demonstrations, farmers' meetings, movable schools, clubs, and community shows is incalculable. They serve to carry the institution to the farmer and to the home-maker.

## General Extension

This phase of the extension service of the University is conducted in cooperation with the United States Bureau of Education, and is intended to make the Liberal Arts and other branches of educational curriculum of greater service to the people of the State.

## Agricultural Experiment Station

Vitally associated with the extension service is the experimental work in agriculture.

In 1847 an act was passed making provision for a State laboratory in which the application of chemistry to agriculture was to be undertaken. In 1858 experimentation was undertaken on the College farm. After two or three years this work was interrupted by the general financial distress of the time and by the Civil War. In 1888, under the provisions of the Hatch Act of the preceding year, the Agricultural Experiment Station was established.

This act states the object and purpose of the experiment station as follows:

> That it shall be the object and duty of said Experiment Stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity or new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective States or Territories.

Prior to the establishment of the experiment stations there was practically no agricultural science in this country. The work done by these institutions during the past quarter of a century has given a science of agriculture to teach, and laid a broad foundation for development.

The placing of agricultural demonstrations and extension work on a national basis has been the direct outgrowth of the work of the experiment station.

The students of the University, taking courses in the College of Agriculture, are kept in close touch with the investigations in progress.

## The Eastern Branch

The Eastern Branch of the University of Maryland is located at Princess Anne, Somerset County. It is maintained for the education of negroes in agriculture and mechanic arts.

## ADMINISTRATION

The government of the University is vested by law primarily in a Board of Regents, consisting of nine members appointed by the Governor for terms of nine years. The administration of the University is vested in the President. The University Council, composed of the President, the Assistant to the President, the Director of Agricultural Experiment Station, and Director of the Agricultural and Home Economics Extension Service, and the Deans, acts as an advisory board to the President on all phases of University work. The faculty of each college or school constitutes a faculty council which passes on all questions that have exclusive relationship to the unit represented.

Pending permanent coordination and reorganization of some departments, the following educational organizations are in effect:

College of Agriculture.
School of Engineering.
School of Liberal Arts.
School of Medicine.
The Law School
School of Dentistry.
School of Pharmacy.
School of Education.
School of Chemistry.
School of Home Economics.
The Graduate School.
The Summer School.
Department of Military Science and Tactics.
Department of Physical Education and Recreation.

The College of Agriculture offers curricula in: (1) General Agriculture; (2) Agronomy; (3) Botany; (4) Farm Management; (5) Geology and Soils; (6) Pomology; (7) Vegetable Gardening; (8) Floriculture; (9) Landscape Gardening; (10) Economic Zoology; (11) Pre-Medical; (12) Two-Year Agriculture; (13) Animal Husbandry.

The School of Chemistry offers curricula in: (1) General Chemistry; (2) Chemical Engineering; (3) Agricultural Chemistry; (4) Biological Chemistry.

The School of Education offers curricula in: (1) Agricultural Education; (2) Home Economics Education; (3) Industrial Education; (4) General Education.

The School of Engineering offers curricula in: (1) Civil Engineering; (2) Mechanical Engineering; (3) Electrical Engineering; (4) Highway Engineering; (5) Sanitary Engineering; (6) Two-Year Courses in Mechanic Arts.

The Graduate School offers courses in any of the subjects in which a graduate may desire to obtain advanced degrees. The Graduate School consists of all students taking graduate work in the various departments. Those qualified to supervise graduate work in the various departments will constitute the faculty of the Graduate School, presided over by a research specialist designated as Dean.

The School of Home Economics offers a curriculum in which may be obtained the general principles of home economics, a knowledge of home economics for teaching purposes, or a specialized knowledge of particular phases which deal with the work of the dietitian or institutional manager.

The School of Liberal Arts offers curricula with majors in: (1) Ancient Languages and Philosophy; (2) Economics; (3) English Language and Literature; (4) General Science; (5) History and Political Science; (6) Journalism; (7) French, German, or Spanish; (8) Public Speaking with reference to Special Professions; studies also are offered in Music and Library Science.

The Department of Military Science and Tactics has charge of the work of the Reserve Officers' Training Corps unit established by the War Department. During the first two years of the student's stay at the University he is required to take the Basic R. O. T. C. courses. During his junior and senior years he may elect three credit hours in Reserve Officers' Training Corps each term.

The Department of Physical Education and Recreation works in close co-operation with the military department and supervises all physical training, general recreation, and intercollegiate athletics.

The Summer School of six weeks offers courses in subjects given in any of the schools during the regular session of the University, with the exception of Medicine, Dentistry, Pharmacy, and Law, and in special subjects, such as school administration, classroom management and principles of secondary education for high school and elementary school teachers. Certain courses given in the Summer School are of collegiate grade and may be counted toward the bachelor's degree. Advanced courses may count toward the master's degree.

General matter having relationship to offerings of the School of Medicine and the Schools of Pharmacy and Dentistry, and the School of Law will be found elsewhere.

## ADMISSION

Applicants for admission to the University must be at least sixteen years of age. Women are admitted to all courses and under the same conditions as men. Students may be admitted at any time, but should enter at the beginning of one of the three terms.

Students may be admitted by examination, or by certificate from an accredited high school or preparatory school, or by transfer from another institution.

In general the requirements for admission to the freshman class are the same as those prescribed for graduation by the approved high schools of Maryland. An applicant must offer for admission at least 15 units of credit by examination, or by a certificate from an approved high school or its equivalent. A unit represents a year's study in any subject in a secondary school and constitutes approximately a quarter of a full year's work. It presupposes a school year of 36 to 40 weeks, recitation periods of from 40 to 60 minutes, and for each study four or five class exercises a week. Two laboratory periods in any science or vocational study are considered as equivalent to one class exercise.

Of the fifteen units presented, seven are specifically designated—eight for the School of Engineering—and eight may be elected from any subject that the high school offers toward graduation.

Students are admitted without examination, if they can present certificates showing that they have completed the necessary entrance subjects. The certificates presented by the candidates must be officially certified by the principals of the schools attended and must state in detail the work completed. Blank certificates conveniently arranged for the desired data will be sent upon application.

Candidates not admitted by certificates will be required to take written examinations on the entrance subjects. These examinations are offered in June and September. Exact dates will be sent upon request.

### Required and Elective Subjects

### Prescribed Units

| | | |
|---|---|---|
| English | 3 | |
| Mathematics | 2 | (For Engineering 3)* |
| Science | 1 | |
| History | 1 | |
| Total | 7 | (For Engineering 8) |

*Additional unit includes Algebra ½ and Solid Geometry or Plane Geometry ½.

Requirements for admission to the Medical School and Schools of Dentistry, Pharmacy and Law will be found under the chapters given to these schools.

**Elective Units (eight)**—To be selected from the following subjects:

Agriculture,
Astronomy,
Botany,
Chemistry,
Civics,
Commercial subjects,
Economics,
English,
General Science,
Geology,
History,
Home Economics,
Industrial subjects,
Language,
Mathematics,
Physical Geography,
Physics,
Physiology,
Zoology,

## Advanced Standing

A student coming from a standard college or university may secure advanced standing by presenting a statement of his complete academic record certified by the proper officials. This statement must be accompanied by a set of secondary school credentials presented for admission to the college or university. Full credit is given for work done in other institutions when found to be equivalent in extent and quality to that required at this University. An applicant may request examination for advanced credit in any subject. In case the character of a student's work in any subject is such as to create doubt as to the quality of that which preceded, the University reserves the right to revoke at any time any credit assigned on certificate.

## Registration

The University year begins September 20 and ends June 15, except for the branches located in Baltimore. (See calendar on page 5). Monday, September 20, and Tuesday, September 21, are devoted to matriculation and registration of students for the first term. Registration for the second and third terms takes place before the close of the preceding terms.

New students should go at once to the new agricultural building, where they will find a committee in charge of matriculation and registration.

Upper classmen should consult their advisers or deans and then proceed in the regular way. Students are not admitted to classes for which they are not registered in due form.

## Unclassified Students

Mature persons who have had insufficient preparation to pursue any of the four-year courses may, with the consent of the Committee on Courses, matriculate for such subjects as they are fitted to take. Such

students, however, will be ineligible for a degree until they have satisfied the entrance requirements and completed an approved four-year course of study.

### Graduation, Degrees, and Certificates.

All undergraduate four-year courses lead to the degree of Bachelor of Science or Bachelor of Arts. The total requirements for graduation vary, according to the type of work in the different colleges, from 204 to 220 term credit hours. A term credit hour is one lecture or recitation each week for one term of twelve weeks; two or three hours of laboratory or field work are counted equivalent to one lecture or recitation. All practical work is scheduled for two or three hours, depending upon the nature of the work. To find full information of requirements, the student should refer to the description of the school in which he is interested.

Candidates are recommended for graduation after they have completed the prescribed course of study, including all the required work and enough electives to total the required credit hours.

The University confers the following degrees: Bachelor of Arts, Bachelor of Science, Master of Arts, Master of Science, Doctor of Philosophy in Arts, Doctor of Philosophy in Science, Civil Engineer, Mechanical Engineer, Electrical Engineer, Bachelor of Laws, Doctor of Medicine, Doctor of Dental Surgery, Graduate in Pharmacy and Pharmaceutical Chemist.

Degrees are not granted to the students in the two-year curricula, but at graduation time certificates are awarded.

## BUILDINGS

Some eighteen buildings have been erected on the University campus for research, extension, and residence educational purposes. The buildings comprised in the group are the Agricultural Building, Calvert Hall, the Library, Engineering Buildings, Chemical Building, Morrill Hall, Horticultural Building, the Hospital, Stock Judging Pavilion, Poultry Building, temporary dining-hall, temporary auditorium, Girls' Home Economics Practice House, and the Agricultural Experiment Station group. Other buildings are located in Baltimore.

### Agricultural Building

The Executive Offices, the College of Agriculture and School of Education and the Agricultural and Home Economics Extension Service are housed in the Agricultural Building. This structure was completed and occupied in April, 1918. The building also contains biological, soils and bacteriological laboratories.

### Buildings in Baltimore

The buildings of the University in Baltimore are located at the corn of Lombard and Greene streets. They consist of the original buildi erected in 1814, and more modern buildings adjoining, one of which devoted to Law and one the University Hospital.

### Calvert Hall

Excellent dormitory accommodations are provided in Calvert Hall, modern fireproof structure erected and occupied in 1914. It took th place of the two dormitories destroyed by fire in 1912.

### Morrill Hall

The School of Liberal Arts and the Department of Zoology are house in Morrill Hall, which is a three-story building erected in 1898. Thi building formerly was occupied by the work in agriculture and engi neering.

### Chemical Building

The Chemical Building provides a home for the School of Chemistry and for the state work in analysis of feeds, feritlizers and agricultura lime. It has classrooms, laboratories, and offices for all undergraduate and graduate work in chemistry.

### Engineering Buildings

The Mechanical Building was the first of the Engineering group constructed, having been completed and occupied by the Department of Mechanical Engineering in 1898. The Civil Engineering and Electrical Engineering additions, with accompanying shops, were built in 1910 The three buildings are connected by closed passageways.

### The Infirmary

The infirmary was erected in 1901 and makes possible excellent treatment for students in cases of sickness. It has a private ward for segregation of contagious diseases, quarters for trained nurse, operating room doctor's office, special culinary equipment, and accommodations for twenty patients.

### The Horticultural Building

Classrooms, propagation rooms, and offices are contained in the Horticultural Building, completed in 1915. In connection with this, ten modern greenhouses are so constructed as to have entry into each direct from building.

### The Stock Judging Pavilion

This building is used for stock judging competitions, for stock shows and to house a part of the equipment of the dairy husbandry and farm

machinery departments of the College of Agriculture. Connecting this building with the Agricultural Building is an auditorium capable of seating 600 persons.

### The Poultry Buildings

Research in poultry projects and laboratory practice is carried on in the Poultry Building. The main building contains classrooms, laboratories, offices and incubating rooms.

### Experiment Station Group

The main building of the experiment station group is a large brick structure of the colonial period. It contains the office of the Director of the Station, the chemical and physiological laboratories, and a laboratory for research in soils. Other buildings of this group contain seed and milk testing laboratories, classrooms, and others are greenhouses, Agronomy Building, a secondary horticultural building, barns, farm machinery buildings, silos, etc.

### Temporary Dining-Hall

A temporary wooden structure has been erected to serve as a dining-hall until the Legislature appropriates money to put up a permanent building. This wooden structure is well built and contains kitchen equipment and other facilities for comfortably taking care of about 600 persons.

### Other Buildings

Another wooden structure has been used for the last few years as an auditorium. It is capable of seating about 400 persons. The College also maintains a laundry building in which it handles the students' laundry at cost. It also has two frame dwelling-houses in which it houses part of its labor. A brick power-house contains apparatus for pumping all water for College use. Another small frame house contains machinery for canning and drying of fruits and vegetables. A small brick gas-house has apparatus for manufacturing gas for use in the laboratories.

### The Filtration Plant

Recently completed is a modern filtration plant for furnishing an ample supply of water for use in the dormitories and general college buildings. This plant consists of a reservoir with a reserve supply of 1,500,000 gallons, sediment tanks, filter beds, pumps, etc.

### The Library

The two-story brick building housing the Library was built in 1894. On the first floor is collected material relating to the various phases of the subject of agriculture—books, bound periodicals, Experiment Station Records, all Experiment Station Bulletins of the United States,

United States Department of Agriculture and Farmers' Bulletins. The special catalog cards issued by the United States Department of Agriculture make accessible the large amount of state and national bulletin literature on agricultural subjects.

The second floor of the Library is used as a general reading and reference room as well as a stack room for all books except the agricultural.

The entire Library contains approximately 5,000 bound books and 5,000 United States Government documents and unbound reports and pamphlets. All material is on open shelves where students can easily locate it. The Library is open from 8.30 A. M. to 5.30 P. M., six days of the week; all evenings, with the exception of Saturday, from 6.30 to 10; and on Sunday afternoon, from 2.30 to 5.30. The librarian or an assistant is always in charge.

## ORGANIZATIONS

### The Alumni Association.

The Alumni Association is an organization composed of alumni of the University. This Association has an office at the University and has several branch associations. It publishes a monthly paper, *The State University Alumnus*, and a *Bi-Annual Record.* The Association is active in legislative and other measures for the support of the University and is represented on the Board of Trustees and on the committee which controls athletics by four members, two on each.

### The Student Assembly

The Student Assembly is composed of all the students for carrying out a system of student self-government. The Student Executive Council is the executive committee of the Student Assembly and acts in coöperation with the faculty in the management of student affairs.

### The Dramatic Club

The Dramatic Club is organized for the purpose of presenting at least one play each year. It is made up of men who have had experience either in this work since coming to the University or in high school.

### Fraternities and Sororities.

There are at the University four national fraternities, Kappa Alpha, Sigma Nu, Sigma Phi Sigma, Phi Alpha; two local fraternities, Nu Sigma Omicron, Sigma Tau Alpha; one local sorority, Sigma Delta.

### Societies

Two literary societies are maintained by the students, the Poe and New Mercer. These hold weekly meetings at which regular programs are presented.

The Liebig Chemical Society is made up of students specializing in chemistry. Special lectures by students and specialists in certain branches of chemistry and open discussions of various chemical questions are featured.

The Engineering Society is composed of students in the School of Engineering.

The agricultural Club is organized according to special interests into the Horticultural Society, the Agronomy Society, and the Animal Husbandry Society.

Programs are offered in the Engineering Society and Agricultural Club similar to that of the Liebig Chemical Society, except that the subjects pertain to engineering or agriculture.

### Le Cercle Francais

This club was organized in 1919 by the Department of French. Its membership is composed of the faculty of the department, students pursuing courses in French, and others interested in the study of that language. The aims of the club are to awaken a live interest in French literature, culture, history and customs, and to build up an ease in the use of the language. Although fostered by the School of Liberal Arts, this club is not restrcited to students enrolled therein, but is open to all who are interestd in things French.

### Clubs

The Rifle Club is affiliated with the National Rifle Association and engages in matches with other colleges and rifle organizations.

The Chess and Checker Club is organized for the promotion of these games among those that engage in them. Annual tournaments are conducted for which gold medals are awarded.

The County Clubs are organizations of students from the same counties. The Baltimore City Club and District of Columbia Club are organizations of the same nature.

The Rossbourg Club is the student organization which has charge of most of the formal dances of the students. This club is open to all students.

### The Keystone Club

This organization came into being during the past academic year when a score of men from the "Keystone State" found each other on the campus. All Pennsylvanians are eligible. Its aim is to promote a feeling of interest and good fellowship among the students from Pennsylvania.

### The Christian Associations

The Young Men's and Young Women's Christian Associations are organized to be of general service to the students. They perform important functions in matters of obtaining employment for worthy stu-

dents, in receiving new students, and in helping to maintain generally a high morale and state of good fellowship in the student body. A reading-room, chess and checkers, and other games are maintained by the association for use of all the students.

### Student Publications

A weekly five-column newspaper, *The Review*, is published by the students. Besides this the members of the junior class publish each year an annual book *The Reveille*. Both publications reflect the news and atmosphere of general college life.

NOTE.—For this issue of the catalogue it has been impossible to get in print the student organizations in the Law and Medical Schools.

## HONORS AND AWARDS

Honorable mention is given to students for excellence in undergraduate work in the upper one-fifth of each school as follows: The upper one-tenth is given first honors, and the rest second honors, provided that the student's course average is above 80.

### Debating and Oratory

An annual debate is held each year in January between the Poe and New Mercer literary societies for the "President's Cup," given by Dr. H. J. Patterson.

A gold medal is awarded by the Alumni Association each year to the best debater in the University, the test being a debate between picked teams from the two literary societies.

The University gives gold medals to members of winning teams in intercollegiate debates.

The Oratorical Association of Maryland Colleges, consisting of Washington College, Western Maryland College, St. John's College, and University of Maryland offers each year gold medals for first and second places in an oratorical contest that is held between representatives of the four institutions.

### Athletics

The class of 1908 offers annually to "the man who best typifies the college athlete" a gold medal. The medal is given in honor of former President R. W. Silvester and is known as "The Silvester Medal for Excellence in Athletics."

### The Military Medal

The class of 1899 offers each year a gold medal to the member of the battalion who proves himself the best drilled soldier. The medal is awarded after an individual drill by each of the contestants.

### The Citizenship Prize

A gold medal is presented annually by H. C. Byrd, a graduate of the class of 1908, to the member of the senior class who during his collegiate career has nearest typified the model citizen and who has done most for the general advancement of the interests of the University.

## FEES AND EXPENSES

NOTE.—Following information about fees, scholarships, etc., has no relationship to the Medical and Law group. This information in their connection will be found under their group headings.

Make all checks payable to University of Maryland.

The charges for each term must be paid at the beginning of the term. Students will not be admitted to classes until payment has been made or until satisfactory arrangements have been made for deferring payment. An additional charge of 10% will be added to accounts remaining unpaid at the close of the first month after registration.

No charge is made for tuition in any of the colleges or schools except Law, Medicine, Dentistry, and Pharmacy.

The estimated average annual expenses of undergraduates are as follows:

| | *First Term.* | *Second Term.* | *Third Term.* | *Total.* |
|---|---|---|---|---|
| Fixed Charges ..... | 20.00 | 20.00 | 20.00 | 60.00 |
| Board (36 weeks) ..... | 80.60 | 67.70 | 67.70 | 216.00 |
| Lodging (39 weeks) ... | 24.05 | 24.05 | 24.05 | 72.15 |
| Laundry (36 weeks) ... | 7.20 | 7.20 | 7.20 | 21.60 |
| Damage Fee..... | 5.00 | .... | .... | 5.00 |
| *Athletic Fee..... | 10.00 | .... | .... | 10.00 |
| Totals..... | $146.85 | $118.95 | $118.95 | $384.75 |

The above does not take into consideration the cost of books, supplies and personal needs. This depends largely on the tastes and habits of the individual student. Books and supplies average about $40.

The fixed charges made to all students are a part payment of overhead expenses, such as janitor services, hospital and doctor's fees, general laboratory fees, library, physical training, etc.

Board, lodging and other charges may vary from term to term, but every effort will be made to keep expenses as low as possible.

The damage fee is to cover breakage, loss of library books, and injury to property which cannot be charged directly against any student.

*This is a special fee collected by the University for the support of Athletics and is turned over, in toto, to the Athletic Board, which expends it.

Damage to university property will be charged pro rata to the whole student body unless the offender is known. Any unused part of this fee is returned to the student upon withdrawal or at the close of the year.

In case of illness requiring a special nurse or special medical attention the expense must be borne by the student.

Board and lodging may be obtained at boarding-houses or in private families if desired.

Students rooming outside the University may obtain board and laundry at the same rates as those living in the dormitories.

Day students may get lunch at nearby lunch rooms.

All the University property in possession of the individual student will be charged against him, and the parent or guardian must assume responsibility for its return without injury other than results from ordinary wear.

All Students assigned to dormitories are required to provide themselves with one pair of blankets for single bed, two pairs of sheets for single bed, four pillow cases, six towels, one pillow, two laundry bags, one broom and one waste basket.

**Special Fees.**

| | |
|---|---|
| Bacteriology Laboratory Fee ..... | $2.00 |
| Fee for special condition examination ..... | 1.00 |
| Fee for changes in registration after first week of term | 1.00 |
| Fee for failure to register within seven days after opening of term ..... (.25 for each succeeding day of delay) | 2.00 |
| Diploma fee payable prior to graduation ..... | 5.00 |
| Certificate fee payable prior to graduation ..... | 3.00 |

No diploma will be conferred upon, nor any certificate granted to a student who is in arrears in his accounts.

**Graduate Fees.**

Each graduate student is subject to a matriculation fee of $10.00, a fixed charge of $1.00 per term credit hour and a diploma fee of $10.00.

**Withdrawals.**

When a student desires to withdraw from the University he is required to secure from his Dean a written approval, which must be presented to the Registrar. *Charges for full time will be continued against him unless this is done.*

Students withdrawing before the end of any term will be charged $7.00 per week for board and $2.00 per week for lodging for the time during the term preceding their withdrawal.

### Refunds

No fixed charge will be refunded.

No laboratory fee will be refunded after the middle of the term.

The low charge for board at the dining hall is made possible only by the use of the term basis in figuring costs. The overhead is fixed for the term and no refunds can be made for short absences without a loss to the dining hall and to the students who eat there. Therefore, no refunds can be made except in case of withdrawal or prolonged absence due to sickness or unavoidable cause.

## SCHOLARSHIPS AND SELF AID

### High School Scholarships.

While the University has no endowment nor loan funds with which to assist students, it has established for each high and preparatory school in Maryland and the District of Columbia one scholarship each year. For the three counties of Maryland which do not have high schools, Calvert, Charles and St. Mary's, one scholarship each year is given. These scholarships have a value of fifty dollars and are credited to the holder's account.

These scholarships are offered under the following conditions:

1. The holder must be a graduate of a high school and qualified to enter the freshman class.

2. The appointment to the scholarships must be made by the county school superintendent upon recommendation of the principal of the high school. In making recommendations high school principals should not only take into consideration class standing but also inability to meet the expenses of a university education.

3. The appointment shall be made for the term normally required to complete the curriculum selected.

4. The scholarship will be forfeited by indifference to scholastic work or by disregard of rules of the University.

5. Scholarships awarded to preparatory schools and to high schools of Baltimore and Washington shall be given on recommendation of the principals direct to the University. Recipients of preparatory school scholarships must be qualified to enter the freshman class.

6. Applicants from Charles, St. Mary's, and Calvert counties may take one of the non-collegiate curriculums or, if entering from another institution, may take one of four-year curriculums leading to a degree.

### Fellowships

The University also offers a number of fellowships. These may be given either to its own graduates or the graduates of other colleges who desire to pursue courses in the Graduate School leading to advance de-

grees. Fellowships are available in the College of Agriculture, School of Engineering, School of Chemistry, and School of Liberal Arts. These fellowships are worth from $500 to $720 per year.

### Industrial Scholarships

There are available each year, as they become vacant, a number of industrial scholarships, in which students receive compensation for attending to certain prescribed duties, such as waiting on the tables in the dining hall, janitor service in the dormitory, and postmaster. Students may frequently earn enough in this way to cover board and lodging.

### Student Labor

Students may earn a considerable portion of their expenses by doing work for the several departments on an hour basis. Services of those who have a good knowledge of stenography, typewriting, electrical, or mechanical work are in demand. Considerable work is available around the buildings and grounds and on the Agricultural Experiment Station farm.

# THE COLLEGE OF AGRICULTURE

The teaching of a rational, practical system of farming is the primary aim of the College of Agriculture. The permanent prosperity of rural citizens is in direct proportion to the producing capacity of the land. The most successful farmer is the one who can produce a maximum quantity per acre of the best quality of agricultural products at a minimum cost and dispose of them in the markets to the best advantage. The modern farmer must know the kinds of plants to grow and how to improve them; how to maintain orchards, gardens, and attractive surroundings; something of the soil, its cultivation and conservation of fertility; how to combat plant diseases and insect pests; the selection, breeding, and feeding of live stock; the marketing of farm products; modern farm buildings, farm equipment and conveniences of the home; and finally how to be leaders and promote good citizenship in rural life.

The curricula are planned to give the student a general knowledge of all phases of agriculture and related sciences, but at the same time afford an opportunity to specialize along the lines in which he is particularly interested. The plan provides for those who wish to take up professions such as teaching, research, county agent work, as well as farming.

### Organization

For administrative purposes and for ease of instruction the School of Agriculture is organized as follows:

A. Division of Plant Industry, including the following departments:
   1. Horticulture.
      a. Pomology.
      b. Vegetable Gardening.
      c. Landscape Gardening.
      d. Floriculture.
   2. Agronomy.
      a. Forage Crops.
      b. Grain Crops.
   3. Plant Morphology and Mycology.
   4. Plant Physiology.
   5. Plant Pathology.
   6. Foresty.

B. Division of Animal Industry, including the following departments:
   1. Department of Dairy Husbandry, comprising Dairy Stock, Production, Dairy Manufacture and Marketing.
   2. Department of Animal Husbandry, comprising Cattle, Horses, Swine, Sheep, Goats.

3. Department of Poultry Husbandry.
4. Department of Animal Pathology and Veterinary Medicine.
5. Department of Bacteriology and Sanitation.
6. Laboratory of Biological Products.

C. The Department of Geology and Soils.
D. The Department of Farm Management, including also Agricultural Economics, Markets, and Rural Organization.
E. The Department of Zoology, including General Zoology, Entomology, Bee Culture, and Fish Culture.
F. The Department of Farm Equipment.
G. The Department of Short Courses in Agriculture.

### Equipment

The College has about 320 acres of land for use in experimental work, orchards, truck gardens, and for pasture land. A portion of the land is given over solely for instructional purposes.

The College of Agriculture is housed in the newest building on the campus, Agricultural Hall. This building is the home of the Departments of Agronomy, Soils, Animal Husbandry, Dairy Husbandry, Farm Management, Bacteriology, Botany, and in part Horticulture. Many of the departments now have very well equipped laboratories and others are under way.

The Horticultural Department has at its disposal a range of ten greenhouses that are fifty by twenty feet and which join with spacious laboratories in a long brick structure. Together with the greenhouses, necessary cold-frames and hotbeds are provided.

The Department of Zoology has quarters on the first and second floor of Science Hall with laboratories well supplied with collections of insects, models, microscopes, and other supplies necessary for practical work in zoology and entomology. A greenhouse with an aquarium and a screen insectary adjacent to the laboratories are available for class and investigational work.

The proximity of the College to Washington, D. C., with its United States Department of Agriculture, offers unusual opportunities for agricultural students.

With its new building, laboratories, greenhouses, and farm, the College of Agriculture is prepared to give a thorough training in the science and art of farming.

### Agricultural Experiment Station

The College of Agriculture works in cooperation with the Agricultural Experiment Station. Most of the subject matter in agricultural courses is tested by the station or furnished as original from its researches. Methods and material which are valuable in one state are often worth-

less in another, and the station makes it a point to find what is best for the State of Maryland.

The members of the staff employed for research are available to spend some time teaching advanced students. Some are employed to divide their time between college instruction, experiment station research, and extension teaching.

### Fellowships

The experiment station employs several graduate students to conduct experiments along certain lines with the privilege at the same time of working toward advanced degrees by taking graduate instruction in the College. There are also several fellowships in the College of Agriculture where graduate students are employed to spend part time assisting in class and laboratory work. The time required for a degree depends on the nature of the fellowship held. The arrangement makes it possible for a student to get valuable experience while he still is in College. Those who are interested and qualified should write to the Dean of the College for information.

### Farm Experience

It is impossible for students who have not had farm experience to secure the fullest benefit from any of the agricultural courses. A committee of the faculty is appointed to see that all students have a fair knowledge of actual farm practices before graduation. Students are often required to spend from three to nine months on a farm approved by the committee in charge. Weekly reports of the farm operations are sent to the College and a final examination is given upon the student's return. The University degree is withheld until the student satisfies the requirement.

### Instruction, Degrees, and Certificates

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

1. Graduate curricula extending over one year for the degree of master of science and three years for the degree of doctor of philosophy, given under the supervision of the Graduate School. Further information will be found under that heading.
2. Four-year curricula leading to the degree of bachelor of science in general agriculture and biological sciences or any special phase of these sciences.
3. Two-year non-collegiate agriculture leading to a certificate of credit.
4. One-week course—"Farmers' Week."

### Curricula in Agriculture

All students registered in the College of Agriculture take the same work in the freshman year. At the end of the year they may elect to specialize in a particular department or they may withhold the decision to the end of the sophomore year without loss of time.

## GENERAL FRESHMAN CURRICULUM.

| FRESHMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| General Zoology (Zoo. 101-102) | 3 | 3 | ..... |
| General Botany (Bot. 101) | ..... | ..... | 4 |
| Survey of Agriculture (Gen'l Agr. 101-102) | 1 | 1 | ..... |
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Public Speaking (Pub. Sp. 101-103) | 1 | 1 | 1 |
| ELECT ONE OF THE FOLLOWING GROUPS: | | | |
| Group A— | | | |
| Cereal Crops (Agron. 101) | 4 | ..... | ..... |
| Animal Husbandry (A. H. 101) | ..... | 4 | ..... |
| Elementary Vegetable Gardening (Hort. 111) | ..... | ..... | 4 |
| Group B— | | | |
| Social and Economics History of U. S. (H. 118-120) | 3 | 3 | 3 |
| Group C— | | | |
| Language | 3 | 3 | 3 |
| Group D— | | | |
| Mathematics | 3 | 3 | 3 |
| Basic R. O. T. C. (M. I. 101) | 2 | 2 | 2 |

Those who do not care to specialize in any particular phase of agriculture will follow the curriculum called General Agriculture.

## GENERAL AGRICULTURE.

### SOPHMORE YEAR.

| | | | |
|---|---|---|---|
| Feeds and Feeding (A. H. 102) | 4 | ..... | ..... |
| Principles of Dairying (D. H. 101) | 3 | ..... | ..... |
| Dairy Production and Barn Practice (D. H. 102) | ..... | 3 | ..... |
| Management of Dairy Young Stock (A. H. 103) | ..... | ..... | 3 |
| Pomology (Hort. 102) | 4 | ..... | ..... |
| Geology (Soils 101) | 3 | ..... | ..... |
| Introductory Study of Soils (Soils 102-103) | ..... | 3 | 3 |
| Plant Physiology (Plt. Phy. 101-102) | ..... | 4 | 3 |
| Grain Judging (Agro. 102) | ..... | 1 | ..... |
| Forage Crops (Agro. 103) | ..... | ..... | 4 |
| Basic R. O. T. C. (M. I. 102) | 2 | 2 | 2 |
| Elective | 2 | 5 | 3 |

### JUNIOR YEAR.

| | | | |
|---|---|---|---|
| Farm Dairying (D. H. 107) | 3 | ..... | ..... |
| Farm Machinery | 3 | ..... | ..... |
| Tractors and Trucks | ..... | ..... | 3 |
| Elements of Economics (Econ. 101-102) | 3 | 3 | ..... |
| Plant Pathology (Plt. Path. 101) | 3 | ..... | ..... |
| Entomology (Zoo. 103) | ..... | ..... | 3 |
| Technical Composition (Eng. 104-106) | 2 | 2 | 2 |
| Elective | 3 | 12 | 9 |

### SENIOR YEAR.

| | | | |
|---|---|---|---|
| Farm Management (Agri. Econ. 10) | 3 | 3 | ..... |
| Farm Buildings | 2 | ..... | ..... |
| Animal Diseases (V. M. 102) | ..... | 4 | ..... |
| Elective | 12 | 10 | 17 |

## GENERAL AGRICULTURE.

Gen'l Agr. 101-103. *Survey of Agriculture.* One credit hour each term: one lecture. First and second terms. Freshman year.

A course designed to assist the new students in adjusting themselves to the demands and problems of college life, and to aid them in the selection of courses in the subsequent years. Students will have an opportunity to hear the different phases of agriculture discussed by the heads of the various departments of the College of Agriculture.

## DIVISION OF PLANT INDUSTRY

### HORTICULTURE

There are several reasons why the State of Maryland should be pre-eminent in the different lines of horticulture and offer such excellent opportunities for horticultural enterprises. A few of the more evident ones are the wide variation in soil and climate from the Eastern Shore to the mountainous counties of Allegany and Garrett in the west, the nearness to all of the large eastern markets, the large number of railroads, interurban lines and waterways, all of which combine to make marketing easy and comparatively cheap.

The Department of Horticulture offers four major lines of work, namely: Pomology, Vegetable Gardening, Floriculture and Landscape Gardening. Students wishing to specialize in Horticulture can arrange to take either a general course during the four years or enough work is offered in each division to allow students to specialize during the last two years in any of the four divisions. The courses have been so planned and cover such subject matter that upon their completion students should be fitted either to engage in commercial work, county agent work, or teaching and investigational work in state and federal institutions.

### CURRICULA IN HORTICULTURE

Students who intend to specialize in any of the four divisions of Horticulture are required to take the same subjects during the first two years.

| SOPHOMORE YEAR. Term: | I | II | III |
|---|---|---|---|
| General Geology (Geol. 101) | 3 | ..... | ..... |
| Soils 101-102 | ..... | 3 | 3 |
| Plant Anatomy (Morph. and Myc. 101) | 3 | ..... | ..... |
| Plant Physiology (Plt. Phy. 101-102) | ..... | 4 | 3 |
| Elementary Pomology (Hort. 101) | 4 | ..... | ..... |
| Elementary Floriculture (Hort. 121) | ..... | 3 | ..... |
| Vegetable Forcing (Hort. 118) | ..... | 3 | ..... |
| Elementary Landscape Gardening (Hort. 131) | ..... | ..... | 3 |
| Forage Crops (Agron. 103) | ..... | ..... | 4 |
| Entomology (Zoo. 106) | ..... | ..... | 3 |
| Feeds and Feeding (A. H. 102) | 4 | ..... | ..... |
| Organic Chemistry (Gen'l Chem. 112-113) | 3 | 3 | ..... |
| Basic R. O. T. C. (M. I. 102) | 2 | 2 | 2 |
| Elective | 0 | 0 | 0 |

## POMOLOGY.

| JUNIOR YEAR. Term: | I | II | III |
|---|---|---|---|
| Principles of Economics (Econ. 101-102) | 3 | 3 | ..... |
| Technical Composition (Eng. 104-106) | 2 | 2 | 2 |
| Commercial Fruit Growing (Hort. 102-103) | 3 | 3 | ..... |
| Systematic Pomology (Hort. 104) | 3 | ..... | ..... |
| Small Fruit Culture (Hort. 106) | ..... | ..... | 3 |
| Fruit and Vegetable Judging (Hort. 108) | 2 | ..... | ..... |
| General Plant Pathology (Plt. Path. 101) | 3 | ..... | ..... |
| Horticultural Entomology (Zoo. 113) | ..... | ..... | 3 |
| Genetics (Agron. 107) | ..... | 4 | ..... |
| Elective | 1 | 5 | 9 |

SENIOR YEAR.

| | | | |
|---|---|---|---|
| Farm Management (F. M. 101-102) | 3 | 3 | ..... |
| Economic Fruits of the World (Hort. 107) | ..... | 3 | ..... |
| Advanced Fruit Judging (Hort. 109) | 1 | ..... | ..... |
| Advanced Practical Pomology (Hort. 105) | 1 | ..... | ..... |
| Horticultural Breeding Practice (Hort. 142) | ..... | ..... | 1 |
| Horticultural Research and Thesis (Hort. 143-145) | 2 | 2 | 2 |
| Horticultural Seminar (Hort. 146-148) | 1 | 1 | 1 |
| Elective | 9 | 8 | 13 |

## VEGETABLE GARDENING.

JUNIOR YEAR.

| | | | |
|---|---|---|---|
| Principles of Economics (Econ. 101-102) | 3 | 3 | ..... |
| Technical Composition (Eng. 104-106) | 2 | 2 | 2 |
| Commercial Vegetable Gardening (Hort. 113-115) | 3 | 3 | 3 |
| Tuber and Root Crops (Hort. 112) | 3 | ..... | ..... |
| Small Fruit Culture (Hort. 106) | ..... | ..... | 3 |
| General Plant Pathology (Plt. Path. 101) | 3 | ..... | ..... |
| Horticultural Entomology (Zoo. 113) | ..... | ..... | 3 |
| Genetics (Agron. 107) | 3 | ..... | ..... |
| Elective | ..... | 9 | 6 |

SENIOR YEAR.

| | | | |
|---|---|---|---|
| Farm Management (F. M. 101-102) | 3 | 3 | ..... |
| Systematic Olericulture (Hort. 116) | 3 | ..... | ..... |
| Advanced Vegetable Gardening (Hort. 117) | ..... | ..... | 1 |
| Horticultural Breeding Practice (Hort. 142) | ..... | ..... | 1 |
| Greenhouse Construction (Hort. 125) | ..... | 2 | ..... |
| Horticultural Research and Thesis (Hort. 143-145) | 2 | 2 | 2 |
| Horticultural Seminar (Hort. 146-148) | 1 | 1 | 1 |
| Elective | 8 | 9 | 12 |

## FLORICULTURE.

| JUNIOR YEAR. Term: | I | II | III |
|---|---|---|---|
| Greenhouse Management (Hort. 122-123) | 3 | 3 | ..... |
| Floriculture Practice (Hort. 124) | ..... | ..... | 1 |
| Greenhouse Construction (Hort. 125) | ..... | 2 | ..... |
| Garden Flowers (Hort. 128) | ..... | ..... | 3 |
| Plant Materials (Hort. 132) | 2 | ..... | ..... |
| Plant Materials (Hort. 133) | ..... | ..... | 2 |
| Principles of Economics (Econ. 101-102) | 3 | 3 | ..... |
| Technical Composition (Eng. 104-106) | 2 | 2 | 2 |
| Gen. Plant Pathology (Plt. Path. 101) | 3 | ..... | ..... |
| Hort. Entomology (Zoo. 113) | ..... | ..... | 3 |
| Genetics (Agron. 107) | ..... | 4 | ..... |
| Elective | 4 | 3 | 6 |

### SENIOR YEAR.

| | | | |
|---|---|---|---|
| Commercial Floriculture (Hort. 126-127) | 3 | 3 | ..... |
| Horticultural Breeding Practice (Hort. 142) | 2 | 2 | 1 |
| Horticultural Research and Thesis (Hort. 143-145) | 3 | ..... | 2 |
| Horticultural Seminar (Hort. 146-148) | 1 | 1 | 1 |
| Elective | 11 | 11 | 13 |

## LANDSCAPE GARDENING.

### JUNIOR YEAR.

| | | | |
|---|---|---|---|
| Plant Materials (Hort. 132-133) | 2 | ..... | ..... |
| History of Landscape Design (Hort. 138) | ..... | 1 | ..... |
| Elements of Landscape Gardening (Hort. 134) | ..... | 2 | ..... |
| Garden Flowers (Hort. 127) | ..... | ..... | 3 |
| Principles of Economics (Econ. 101-102) | 3 | 3 | ..... |
| Technical Composition (Eng. 104-106) | 2 | 2 | 2 |
| Systematic Botany (Morph. and Myc. 102) | ..... | ..... | 3 |
| Horticultural Entomology (Zoo. 121) | ..... | ..... | 3 |
| General Plant Pathology (Plt. Path. 101) | 3 | ..... | ..... |
| Engineering Drawing (Dr. 104) | 1 | ..... | ..... |
| Surveying | ..... | ..... | 2 |
| Elective | 6 | 9 | 4 |

### SENIOR YEAR.

| | | | |
|---|---|---|---|
| Landscape Design (Hort. 135-136) | 3 | 3 | ..... |
| Landscape Practice (Hort. 137) | ..... | ..... | 3 |
| Civic Art (Hort. 139) | 2 | ..... | ..... |
| Horticultural Research and Thesis (Hort. 143-145) | 2 | 2 | 2 |
| Horticultural Seminar (Hort. 146-148) | 1 | 1 | 1 |
| Elective | 9 | 11 | 11 |

# DESCRIPTION OF COURSES

## POMOLOGY

**Hort. 101. Elementary Pomology.** Four credit hours; three lectures and one laboratory period. First term, sophomore year.

In this course a study is made of the general practices in Pomology. The proper location and site for an orchard are discussed. Also varieties, planting plans, inter-crops, spraying, cultural methods, fertilizing methods, thinning, picking, packing and marketing are given consideration. In this course these subjects are discussed for apples, peaches, pears, plums, cherries and quinces. The principles of plant propagation as applied to pomology are discussed.

**Hort. 102-103. Commercial Fruit Growing.** Three credit hours: two lectures and one laboratory period. First term. Three credit hours: two lectures and one laboratory period. Second term. Junior year. prerequisite, Hort. 101.

In this course a study is made of the proper management of commercial orchards in Maryland. Advanced work is taken up on the subjects of orchard culture, orchard fertilization, picking, packing, marketing and storing of fruits, orchard by-products, orchard heating and orchard economics.

**Hort. 104. Systematic Pomology.** Three credit hours: two lectures and one laboratory period. First term, junior year. Prerequisite, Hort. 101.

The history, botany and classification of fruits and their adaptation to Maryland conditions are discussed in this course. Exercises are given in describing and identifying the leading commercial varieties of fruits. Students in this course are required to help set up the College fruit show each year.

**Hort. 105. Advanced Practical Pomology.** One credit hour. First term, senior year. Prerequisites, Hort. 102-103 and 104.

A trip occupying one week's time will be made through the principal fruit regions of Eastern West Virginia, Maryland and Pennsylvania. A visit to the fruit markets of several large cities will be made. The cost of this trip should not exceed thirty dollars to each student. Each student will be required to hand in a detailed report covering the trip. The time for taking this trip will be arranged yearly with each class.

**Hort. 106. Small Fruit Culture.** Three credit hours: two lectures and one laboratory period. Third term, junior year.

The care and management of small fruit plantations are discussed in this course. Varieties and their adaptation to Maryland soils and climate, packing, marketing, and a study of the experimental plots and

varieties on the station grounds are made. The following fruits are discussed in the course: the grape, strawberry, blackberry, black cap raspberry, red raspberry, currant, gooseberry, dewberry and loganberry.

**Hort. 107. Economic Fruits of the World.** Three credit hours: three lectures. Second term, senior year. Prerequisites, Hort. 102-103 and 104.

A study is made of the botanical, ecological and physiological characteristics of all species of fruit-bearing plants of economic importance, such as the date, pineapple, fig, olive, banana, nut bearing trees, citrus fruits, newly introduced fruits and the like, with special reference to their cultural requirements in certain parts of the United States and the insular possessions. All fruits are discussed in this course which have not been discussed in a previous course.

**Hort. 108. Fruit and Vegetable Judging.** Two credit hours: two laboratory periods. First term, junior year. Prerequisites, Hort. 101, and 111.

This is a course designed to train men for fruit judging teams and practical judging. Students are required to know at least one hundred varieties of fruit, and are given practice in judging single plates, largest and best collections, boxes, barrels and commercial exhibits of fruits and vegetables. Students in this course are required to help set up the College fruit show each year.

**Hort. 109. Advanced Fruit Judging.** One credit hour: one laboratory period. First term, senior year. Prerequisite, Hort. 108.

## VEGETABLE GARDENING

**Hort. 111. Elementary Vegetable Gardening.** Four credit hours: three lectures and one laboratory period. Third term, freshman year.

This course includes a study of the different types of vegetable gardening, methods of propagation, construction and management of hotbeds and cold-frames. Growing early vegetable plants under glass and the planting, cultivating and harvesting under irrigation and in a large farmer's garden are discussed.

**Hort. 112. Tuber 2nd Root Crops.** Three credit hours: two lectures and one laboratory period. First term, junior year. Prerequisite, Hort. 111.

In this course a study of white potatoes and sweet potatoes is made, which includes considerations of seed, varieties, propagation, soils, fertilizers, planting, cultivation, spraying, harvesting, storing and marketing.

**Hort. 113-115. Commercial Vegetable Gardening.** Three credit hours each term. Junior year. Two lectures and one laboratory periods. Prerequisite, Hort. 111.

The methods employed by truckers and market gardeners in commercial production, equipment, use of hotbeds and cold-frames, field planting, rotation of crops and irrigation. Cultural directions for all vegetables are given, including their varieties, requirements, tillage, control of insects and diseases, grading, storing, packing and marketing. Each student plans and manages intensive cropping systems on small areas and under irrigation, and extensive planting on larger areas in a six-year rotation.

**Hort. 116. Systematic Olericulture.** Three credit hours: one lecture and two laboratory periods. First term, senior year. Prerequisites, Hort. 112 and 113-115.

This course includes a systematic and descriptive study of the leading varieties of the most important vegetables, their origin and botany, adaptation of the various varieties to the different cultural and market conditions, judging and exhibition work.

**Hort. 117. Advanced Vegetable Gardening.** One credit hour. Third term, senior year. Prerequisites, Hort. 112, 113-115 and 116.

A trip of one week is made to the commercial trucking sections of Maryland, Delaware, New Jersey and Pennsylvania. A study of the markets in several large cities is included in this trip. Students are required to hand in a detailed report of the trip. Such a trip should not exceed thirty dollars per student. The time will be arranged each year with each class.

**Hort. 118. Vegetable Forcing.** Three credit hours: two lectures and one laboratory period. Second term, sophomore year. Prerequisite, Hort. 111.

The forcing of vegetables under glass is covered in this course. All vegetables used for forcing are considered, as also the preparation of soils, cultivation, regulation of temperature and humidity, watering, training, pruning, pollination, and harvesting.

## FLORICULTURE.

**Hort. 121. Elementary Floriculture.** Three credit hours: two lectures and one laboratory period. Second term, sophomore year.

An elementary course in the culture of greenhouse and home plants, and of the common annuals and perennials used in outdoor work.

**Hort. 122-123. Greenhouse Management.** Three credit hours: two lectures and one laboratory period. First term. Two credit hours: one lecture and one laboratory period. Second term. Junior year.

A consideration of the methods employed in the management of greenhouses, including the operations of potting, watering, ventilating, fumigation, and methods of propagation.

**Hort. 124. Floriculture Practice.** One credit hour: one laboratory period. Third term. Junior year. Prerequisite, Hort. 122-123.

Designed to give students practical experience in the varoius greenhouse operations of the spring season.

**Hort. 125. Greenhouse Construction.** Two credit hours: one lecture and one laboratory period. Second term Junior year.

A study of the various types of houses, their location, arrangement, construction, and cost; the principles and methods of heating; also the preparation of plans and specifications for commercial and private ranges.

**Hort. 126-127. Commercial Floriculture.** Three credit hours each term: two lectures and one laboratory period. First and second terms. Senior year. Prerequisite, Hort. 124.

The method of culture of florists' bench crops and potted plants; the marketing of cut flowers; the retail store; a study of floral decoration.

**Hort. 128. Garden Flowers.** Three credit hours: two lectures and one laboratory period. Third term. Junior year.

This course aims to acquaint the student with the variety of material available for garden use, being a study of the species of annuals, herbaceous perennials, bulbs, bedding plants, and roses; including their cultural requirements.

**Hort. 129. Amateur Floriculture.** Three credit hours: two lectures and one laboratory. Third term.

A general study of floriculture in relation to the home; the care of house plants; home gardening.

## LANDSCAPE GARDENING.

**Hort. 131. General Landscape Gardening.** Three credit hours: two lectures and one laboratory period. Third term. Sophomore year.

The theory and general principles of landscape gardening and their application to private and public area. Special consideration is given to the improvement and beautification of the home grounds, farmsteads, and small suburban properties. Adapted to students not intending to specialize in landscape, but who wish some theoretical and practical knowledge of the subject. Open to all students.

**Hort. 132. Plant Materials.** Two credit hours: one lecture and one laboratory period. First term. Junior year.

A field and laboratory study of trees, shrubs, and vines used in ornamental planting.

**Hort. 133. Plant Materials.** Two credit hours: one lecture and one laboratory period. Third term. Prerequisite, Hort. 132.

A continuation of Hort. 132 to make the student familiar with the woody plants in spring and summer.

**Hort. 134. Elements of Landscape Design.** Two credit hours: one lecture and one laboratory period. Second term. Junior year.

A consideration of the principles of landscape design; surveys, mapping, and field work.

**Hort. 135-136. Landscape Design.** Three credit hours: one lecture and two laboratory periods. First term. Three credit hours: three laboratory periods. Second term. Senior year. Prerequisites, Hort. 133 and 134.

The design of private grounds, gardens, and of architectural details used in landscape; planting plans; analytical study of plans of practicing landscape architects; field observation of landscape developments.

**Hort. 137. Landscape Practice.** Three credit hours: one lecture and two laboratory periods. Third term. Senior year. Prerequisites, Hort. 135-136.

Tracing and drafting of plans; construction methods; field practice.

**Hort. 138. History of Landscape Gardening.** One credit hour: one lecture. Second term. Junior year.

A study of the different styles and a particular consideration of Italian, English, and American gardens.

**Hort. 139. Civic Art.** Two credit hours: one lecture and one laboratory period. First term. Senior year. Prerequisites, Hort. 134.

General study of principles of city planning and their application to village and rural improvement, including problems in design of civic centers, parks, school grounds, and other public and semi-public areas.

## GENERAL COURSES

**Hort. 142. Horticultural Breeding Practice.** One credit hour; one laboratory period. Third term, senior year. Prerequisite, Genetics, Plant Phys. 104.

Practice in plant breeding, including pollination, hybridization, selection, note taking, and the general application of the theories of heredity and selection to practice are taken up in this course.

**Hort. 143-145. Horticultural Research and Thesis.** Two, three or four credit hours each term. Hours to be arranged.

This course is required of seniors. Advanced students in any of the four divisions of horticulture may select some special problem for individual investigation. This may be either the summarizing of all the available knowledge on a particular problem or the investigation of some new problem. Where original investigation is carried on, students should in most cases start the work during the junior year. The results of the research work are to be presented in the form of a thesis and filed in the horticultural library.

**Hort. 146-148. Horticultural Seminar.** One credit hour each term. Hours to be arranged.

This course is required of seniors; juniors are permitted to attend. In this course papers are read by members of the class upon subjects pertaining to their research or thesis work, or upon special problems assigned them. Discussions of special topics are given from time to time by members of the departmental staff.

## COURSES INTENDED PRIMARILY FOR GRADUATES.

**Hort. 201. Experimental Pomology.** Three credit hours. Second term. Lectures, three hours.

A systematic study of the sources of knowledge and opinion as to practices in Pomology; methods and difficulties in experimental work in Pomology and results of experiments that have been or are being conducted in all experiment stations in this and other countries. A limited number of seniors will be allowed to take this course with the approval of the head of the department.

**Hort. 202. Experimental Vegetable Gardening.** Two credit hours. Lectures, two hours. Second term.

A systematic study of the sources of knowledge and opinion as to practices in Vegetable Gardening; methods and difficulties in experimental work in Vegetable Gardening and results of experiments that have been or are being conducted in all experiment stations in this and other countries. A limited number of seniors will be permitted to take this course with the approval of the head of the department.

**Hort. 203. Experimental Floriculture.** Two credit hours. Lectures, two hours. Second term.

A systematic study of the sources of knowledge and opinions as to practices in Floriculture are discussed in this course. The results of all experimental work in Floriculture which have been or are being conducted will be thoroughly discussed. A limited number of seniors will be permitted to take this course with the approval of the head of the department.

**Hort. 204. Methods of Research.** Two credit hours. Lecture, one hour, one laboratory period. Second term.

In this course special drill will be given in the making of briefs and outlines of research problems, in methods of procedure in conducting investigational work and in the preparation of bulletins and reports. A study of the origin, development and growth of horticultural research is taken up. A study of the research problems being conducted by the department of horticulture will be made, and students will be required to take notes on some of the experimental work in the field and become familiar with the manner of filing and cataloging all experimental work.

**Hort. 205-207. Advanced Horticultural Research and Thesis.** Two, three or four credit hours each term. Hours to be arranged. First, second and third terms.

Students will be required to select problems for original research in either Pomology, Vegetable Gardening, Floriculture or Landscape Gardening. This work is to continue throughout the full year, and final results will be published in the form of a thesis.

**Hort. 208-219. Advanced Horticultural Seminar.**

This course will be required of all graduate students. Students will be required to give reports either on special topics assigned them or on the progress of their own investigational work being done in course 205. Members of the departmental staff will report special research work from time to time.

## REQUIREMENTS OF GRADUATE STUDENTS IN HORTICULTURE

**Pomology**—Graduate students specializing in Pomology who are planning to take an advanced degree will be required either to take or offer the equivalent of the following courses: Hort. 102-103, 104, 107, 201, 204, 205-207 and 208-210; Advanced Plant Physiology 103-5; and Organic Chemistry.

**Vegetable Gardening**—Graduate students specializing in Vegetable Gardening who are planning to take an advanced degree will be required either to take or offer the equivalent of the following courses: Hort. 113-115, 116, 202, 204, 205-207, 208-210; Advanced Plant Physiology 103-5; Organic Chemistry.

**Floriculture**—Graduate students specializing in Floriculture who are planning to take an advanced degree will be required either to take or offer the equivalent of the following courses: Hort. 122-123, 127, 132, 203, 204, 205-207, 208-210; Advanced Plant Physiology 103-5; Organic Chemistry.

**Landscape Gardening**—Graduate students specializing in Landscape Gardening, who are planning to take an advanced degree, will be required either to take or offer the equivalent of the following courses: Hort. 132, 133, 134, 135, 137, 204, 205-207, 208-210; Advanced Plant Physiology 103-5.

**Additional Requirements**—In addition to the above required courses, all graduate students in Horticulture are advised to take Physical Chemistry.

Unless graduate students in Horticulture have had some course work in Entomology, Plant Pathology and Genetics, certain of these courses will be required.

## For Short-Course Students

**Hort. 1. Practical Pomology.** Two lectures and one laboratory period. First term. First year.

This is a general course covering the propagation of our common fruits. Such subjects as orchard site, location, varieties, planting plans, cultural methods, fertilizer requirements, and picking, packing and marketing are discussed. All of the tree fruits are taken up in this course.

**Hort. 2-3. Commercial Fruit Growing.** Three lectures and one laboratory period. First and second terms. Second year. Prerequisite, Hort. 1.

This is an advanced course dealing with the proper management of commercial orchards in Maryland. Special attention is given to the subjects of pruning, picking, packing, marketing and storing of the various fruits. Market problems, transportation and shipping associations receive special attention. Students are required to become familiar with all of the leading commercial varieties of all fruits grown in Maryland. Practice is given in fruit judging and the arrangement of fruits for exhibition purposes. Horticultural by-products are given attention in this course.

**Hort. 4. Small Fruits.** Two lectures and one laboratory period. Third term. Second year.

In this course the production of strawberries, bush fruits and grapes is considered. Methods of propagation, selection of sites, soils, pruning, cultivation, picking, packing and marketing are discussed.

**Hort. 5. Home Vegetable Gardening.** Two lectures and one laboratory period. Third term. First year.

The general principles of vegetable gardening as applied to the growing of vegetables for home use. The laboratory work includes a study of vegetable seeds, seed testing, seed sowing, transplanting and the care of plants in the greenhouses and cold-frames. The students are required to plan, plant and manage a large home garden until the end of the term.

**Hort. 6-8. Commercial Vegetable Gardening.** Two lectures and one laboratory period. First, second and third terms. Second year. Prerequisite, Hort. 5.

This course is planned to run the entire school year. A study of the principles of vegetable gardening, as applied to the growing of vegetables for market and for canning. The course includes the construction and management of hotbeds and cold-frames, sowing and planting, cultivation, growing early vegetable plants, soil preparation, harvesting, grading, packing, marketing, canning and storage. Each student is allotted a definite area and is required to plan, plant and manage it.

**Hort. 9. Landscape and Floriculture.** Two lectures and one laboratory. Second term. First year.

The principles of landscape gardening and their application to the improvement of home grounds. The propagation and culture of garden and greenhouse plants.

**Hort. 10-12. Commercial Floriculture.** Two lectures and one laboratory period. First, second and third terms. Second year. Prerequisite, Hort. 9.

This course is planned to run the full school year. Studies in the propagation and culture of commercial florist crops are taken up in this course. Methods of packing, shipping and marketing will be considered. The course is so organized as to fit students for commercial work.

**Hort. 13-14. Landscape Design and Practice.** Two lectures and three laboratory periods. First and second terms. Second year. Prerequisite, Hort. 13.

The composition of gardens, private estates and related problems. Grading plans, construction, drawing, estimates and laying out of grounds are considered. Plant materials are thoroughly studied in this course also.

## AGRONOMY

The curriculum in agronomy aims to give the student the fundamental principles of crop production. Special attempt is made to adapt the work to the young man who wishes to apply scientific principles of field crop culture and improvement on the farm. At the same time enough freedom is given the student in the way of electives so that he can register for subjects which might go along with the growing of crops on his particular farm. A student graduating from the course in agronomy should be well fitted for general farming, investigational work in the State or Federal Experiment Stations, or for county agent work.

The Agronomy Department has a large, well equipped laboratory in the new agricultural building and a greenhouse for student use, besides free access to the experiment station fields and equipment.

## AGRONOMY.

| SOPHOMORE YEAR. Term: | I | II | III |
|---|---|---|---|
| Forage Crops (Agron. 103) | ..... | ..... | 4 |
| Grain Judging (Agron. 102) | ..... | 1 | ..... |
| Soil Physics and Management (Soils 101-102) | ..... | 3 | 3 |
| General Geology (Geol. 101) | 3 | ..... | ..... |
| Plant Anatomy (Morph. and Myc. 101) | 3 | ..... | ..... |
| Plant Physiology (Plt. Phys. 101-102) | ..... | 4 | 3 |
| Entomology (Zoo. 106) | ..... | ..... | 3 |
| Organic Chemistry (Gen'l Chem. 112-113) | 3 | 3 | ..... |
| Agricultural Chemistry (Ind. Chem. 101) | ..... | ..... | 4 |
| Tuber and Root Crops (Hort. 112) | 3 | ..... | ..... |
| Elementary Pomology (Hort. 101) | 4 | ..... | ..... |
| General and Applied Psychology (Prin. Ed. 105) | ..... | 2 | ..... |
| Basic R. O. T. C. (M. I. 102) | 2 | 2 | 2 |
| Electives | 0 | 3 | 0 |

### JUNIOR YEAR.

| | | | |
|---|---|---|---|
| Grading Farm Crops (Agron. 107) | ..... | 2 | ..... |
| Grading Farm Crops (Agron. 106) | ..... | 4 | ..... |
| Soil Bacteriology (Soils 107) | ..... | ..... | 4 |
| General Bacteriology (Bact. 101-102) | 3 | 3 | ..... |
| General Plant Pathology (Plt. Path. 101) | 3 | ..... | ..... |
| Soil Fertility and Fertilizers (Soils 105) | ..... | ..... | 3 |
| Technical Composition (Eng. 104-106) | 2 | 2 | 2 |
| Principles of Economics (Econ. 101-102) | 3 | 3 | ..... |
| Tractors (Farm Equip. 103) | ..... | ..... | 3 |
| Farm Machinery (Farm Equip. 101) | 3 | ..... | ..... |
| Electives | 8 | 3 | 5 |

### SENIOR YEAR.

| | | | |
|---|---|---|---|
| Crop Breeding (Agron. 104) | ..... | ..... | 3 |
| Methods in Crop Investigations (Agron. 105) | 3 | ..... | ..... |
| Crop Rotation (Agron. 108) | ..... | 2 | ..... |
| Seminar (Agron. 109) | ..... | 1 | ..... |
| Soil Survey and Classification (Soils 106) | 3 | ..... | ..... |
| Farm Management (F. M. 101-102) | 3 | 3 | ..... |
| Studies in Agricultural Economics (A. E. 103) | ..... | ..... | 3 |
| Farm Forestry ( ) | ..... | ..... | 3 |
| Electives | 8 | 11 | 8 |

### Description of Courses

**Agron. 101. Cereal Crops.** Four credit hours: three lectures and one three-hour laboratory period. First term. Freshman year.

A study of the history, distribution, culture, and improvement of the cereal crops.

**Agron. 102. Grain Judging.** One credit hour: one three-hour laboratory period. Second term. Sophomore year. Prerequisite, Agron. 101.

Practice in judging the cereal crops for milling, seeding, and feeding purposes.

**Agron. 103. Forage Crops.** Four credit hours: three lectures and one three-hour laboratory period. Third term Sophomore year.

A study of the history, distribution, adaptation, culture, and uses of forage, pasture, cover, and green manure crops. The laboratory periods are largely devoted to the identification and classification of forage plants and seeds, and purity and viability tests of the seeds.

**Agron. 104. Crop Breeding.** Three credit hours: two lectures and one three-hour laboratory period. Third term. Senior year. Prerequisites, Agron. 101, 103, and 107, Bot. 101.

In this course the principles of breeding are applied to field crops and detailed studies made of methods used in crop improvement work.

**Agron. 105. Methods in Crop Investigations.** Three credit hours: two lectures and one three-hour laboratory period. First term. Senior year. Prerequisites, Agron. 101-103.

This course deals with methods used by experiment stations in crop investigational work. The work of different stations on certain problems is classified with the view of the standardization of methods. Students are required to make reports on and criticise methods used by the different stations in attacking the problems studied.

**Agron. 106. Grading Farm Crops.** Three credit hours: two lectures and one three-hour laboratory period. Second term. Junior year. Prerequisites, Agron. 101, 102, and 103.

A study of market classifications and grades as recommended by the United States Bureau of Markets and practice in determining the grades.

**Agron. 107. Genetics.** Four credit hours: three lectures and one three-hour laboratory period. Second term. Junior year. Prerequisites, Bot. 101 and Morph. and Myc. 101.

A general course in genetics designed to prepare students for later courses in the breeding of crops in which they are specializing.

**Agron. 108. Crop Rotation.** Two credit hours: two lectures. Second term. Senior year. Prerequisites, Agron. 101-103 and Pet. Phy. 101-102.

This course is designed to give the student a thorough knowledge of the principles and practice of crop rotation. Rotations used in this and other states and the scientific principles involved are studied.

**Agron. 109. Seminar.** One credit hour: one lecture. Second term. Senior year.

The seminar is devoted largely to reports by the students on current bulletins and scientific papers dealing with problems in agronomy.

**Agron. 110. Research and Thesis.** Six credit hours. To be arranged. Senior year.

Here the students are given a change to do some investigational work either in the way of collecting information on some phase of agronomic work or working some problem in the laboratory, field, or greenhouse.

## FOR GRADUATE STUDENTS.

**Agon. 201. Biometry.** Amount of credit to be determined by work accomplished. Lectures and laboratory periods.

A study of the statistical methods as applied to problems in Genetics and Plant Breeding. The methods used in the study of variations and correlations are discussed and the biometrical constants worked out by the class for certain assigned or selected data.

**Agron. 202. Crop Breeding.** Amount of credit to be determined by work accomplished. Lectures and laboratory periods.

The content of this course is similar to the undergraduate course in Crop Breeding, but will be adapted more to graduate students and more of a range will be allowed in choice of material to suit special cases.

**Agron. 203. Research.** Amount of credit to be determined by work accomplished.

With the approval of the head of the department the student will be allowed to work on any problem in agronomy or he will be given a list of suggested problems from which he may make a selection.

### For Short-Course Students

**Agron. 1. Cereal Crops.** Three credit hours: two lectures and one three-hour laboratory period. First term. First year.

A study of the history, distribution, adaptations, uses, and culture of cereal crops, a larger part of the term being spent on corn and wheat.

**Agron. 2. Forage Crops.** Three credit hours: two lectures and one three-hour laboratory period. Third term. First year.

A study of the history, distribution, adaptations, uses, and culture of forage and cover crops adapted to Maryland conditions.

**Agron. 3. Grain Judging.** One credit hour: one three-hour laboratory period. Second term. Second year.

A laboratory course in judging grains from the standpoint of the grower, the feeder and the miller.

**Agron. 4. Advanced Agronomy.** Three credit hours: two lectures and one three-hour laboratory period each term. Second year.

Students specializing in agronomy are given special work in judging and grading grains, crop improvement and various other phases of crop production. Students are allowed to elect subjects in other departments for part of the time.

## BOTANICAL GROUP

The purpose of the group is to supply students in Agriculture and General Science with such information as is thought fundamental to their special work and to train specialists in the different phases of the subject. This training includes such knowledge of plants as would fit one for various positions, such as teachers in high schools, normal schools, colleges, and investigators in experiment stations and government service.

### BOTANY.

| SUBJECT. Term: | I | II | III |
|---|---|---|---|
| **SOPHOMORE YEAR.** | | | |
| Plant Anatomy (Morph. and Myc. 101) | 3 | ..... | ..... |
| Plant Physiology (Plt. Phy. 101-102) | ..... | 4 | 3 |
| Quantitative Analysis (Gen'l Chem. 107-108) | 3 | 3 | ..... |
| Advanced Organic Chemistry (Gen'l Chem. 114-116) | 4 | 4 | 4 |
| Geology (Geol. 101) | 3 | ..... | ..... |
| Introductory Soils (Soils 101-102) | ..... | 3 | 3 |
| Systematic Botany (Morph. and Myc. 102) | ..... | ..... | 3 |
| Basic R. O. T. C. (M. I. 102) | 2 | 2 | 2 |
| Elective | 3 | 2 | 3 |
| **JUNIOR YEAR.** | | | |
| General Plant Pathology (Plt. Path. 101) | 3 | ..... | ..... |
| Genetics (Agron. 107) | ..... | 4 | ..... |
| Methods in Plant Histology (Morph. and Myc. 107) | ..... | 3 | ..... |
| Plant Ecology (Plt. Phy. 106) | ..... | ..... | 3 |
| Mycology (Morph. and Myc. 106) | ..... | ..... | 3 |
| Bacteriology (Bact. 101-103) | 3 | 3 | 3 |
| General Physics (Phys. 104) | 3 | 3 | 3 |
| Technical Composition (Eng. 104-106) | 2 | 2 | 2 |
| Elective | 6 | 2 | 3 |

Students specializing in Morphology and Mycology will take Group A; those in Physiology, Group B; and those in Plant Pathology, Group C.

| SENIOR YEAR. | I | II | III |
|---|---|---|---|
| **Group A:** | | | |
| Plant Morphology (Morph. and Myc. 103-105) | 4 | 4 | 4 |
| Advanced Taxonomy (Morph. and Myc. 109) | 3 | ..... | ..... |
| Cytology (Morph. and Myc. 108) | ..... | 3 | ..... |
| Elective | 10 | 10 | 13 |
| **Group B:** | | | |
| Plant Physiology (Plt. Phy. 103-105) | 4 | 4 | 4 |
| Plant Micro-Chemistry (Plt. Phy. 107) | ..... | 3 | ..... |
| Physiological Chemistry (Bio-Chem. 101) | 4 | ..... | ..... |
| Elective | 9 | 10 | 13 |
| **Group C:** | | | |
| Advanced Plant Pathology (Plt. Path. 105-107) | 4 | 4 | 4 |
| Methods in Pathology (Plt. Path. 102-104) | 3 | 3 | 3 |
| Seminar in Pathology (Plt. Path. 108-110) | 1 | 1 | 1 |
| Elective | ..... | ..... | ..... |

### Description of Courses

**Bot. 101. General Botany.** Four credit hours: two lectures and two laboratory periods. Third term. Freshman year.

A general introduction to botany touching briefly on all phases of the subjects and planned to give the fundamental prerequisites for study in the special departments.

### For Short-Course Students

**Bot. 1. General Botany.** Two lectures and one laboratory period. First term. First year.

A survey of the field of botony. Effort is made to give the student an understanding of how plants take up water and nutrients from the soil, how they manufacture foods, and the structures necessary to carry on these processes.

## MORPHOLOGY AND MYCOLOGY

### For Undergraduates.

**Morp. & Myc. 101. Plant Anatomy.** Three credit hours: two lectures and one laboratory period. First term. Sophomore year. Prerequisite, Bot. 101.

An anatomical study of leaves, stems, roots, flowers, and fruits. Where possible plants of economic value are used as type specimens.

**Morph. & Myc. 102. Systematic Botany.** Three credit hours: one lecture and two laboratory periods. Third term. Prerequisite, Bot. 101.

A study of the local flora. A study is made of floral parts and the essential relations between the groups of flowering plants. Students become familiar with the systematic key used to identify plants.

**Morph. & Myc. 103-105. Plant Morphology.** Four credit hours each term. Junior year. Prerequisite, Bot. 101.

A course designed to give the student a comprehensive view of the plant kingdom. It treats of the general morphological evolutionary development and relationships of the various groups of plants, based upon the examinations of selected types from each group.

**Morph. & Myc. 106. Mycology.** Three credit hours: two lectures and one laboratory period. Third term. Junior year.

Introductory comparative study of the morphology, life history, and classification of economic fungi.

**Morph. & Myc. 107. Methods in Plant Histology.** Three credit hours: one lecture and two laboratory periods. Second term. Prerequisites, Morph. and Myc. 101.

Primarily a study in technique. It includes methods of killing, fixing, imbedding, sectioning, staining, and mounting on slides of plant materials.

**Morph. & Myc. 108. Cytology.** Three credit hours: one lecture and two laboratory periods. Second term. Prerequisite, Morph. and Myc. 107.

The structure and life history of the plant cell.

**Morph. & Myc. 109. Advanced Taxonomy.** Three credit hours: one lecture and two laboratory periods. First term.

This course is offered for students who want more proficiency in systematic botany than the elementary course affords. A student who completes the course should be able to classify the grasses and other common plants of the state.

**For Graduate Students.**

**Morph. & Myc. 201. Advanced Mycology.** Two credit hours each term. One lecture and one laboratory period.

A detailed treatment of the classification, morphology and economics of the fungi, with studies of life histories in culture and identification of field material.

**Morph. & Myc. 202. Special Studies of Fungi.** Credit hours according to work done.

Special problems in the structure or life history of fungi or the monographic study of some group of fungi.

## PLANT PHYSIOLOGY

**For Undergraduates.**

**Plt. Phy. 101-102. Plant Physiology.** Four credit hours: two lectures and two laboratory periods. Second term. Three credit hours: two lectures and one laboratory period. Third term. Sophomore year. Prerequisite, Bot. 101. (Third term given also in first term.)

A summary view of the phenomena occurring in plants; complex life of processes are interpreted in terms of simpler ones and reduced finally to the principles of physics and chemistry. The first term is devoted to a study of the constituents of plants, the synthesis of carbohydrates, fats, proteins, respiration, fermentation, and digestion. The second term deals with water requirements, elements essential to plant growth, transpiration, growth and movement.

**Plt. Phy. 103. Plant Ecology.** Three credit hours: one lecture and two laboratory periods. Third term. Prerequisite, Bot. 101.

A study of plants in relation to their environments. Plant formations and successions in various parts of the country are briefly treated. Much of the work, especially the practical, must be carried on in the field, and for this purpose type regions adjacent to the University are selected. It is generally necessary to take three or four trips at some distance from the University, in which case Saturdays are used for that purpose.

**For Advanced Undergraduates and Graduates.**

**Plt. Phy. 104-106. Advanced Plant Physiology.** Four credit hours each term: two lectures and two laboratory periods. Prerequisite, Plt. Phy. 101.

A detailed study of all life processes of plants. The laboratory work generally consists of special work on one or more problems that may continue through the year. Students who write theses for their undergraduate degrees, get the data from special problems assigned for the laboratory work.

**Plt. Phy. 107. Plant Micro-Chemistry.** Three credit hours: one lecture and two laboratory periods. Second term. Prerequisite, Plt. Phy. 101, 102.

Micro-technical methods applied to the identification of organic and inorganic substances found in the plant tissues. These methods are of especial value in the localization of plant substances and in the study of metabolism of plants.

**For Graduates.**

**Plt. Phy. 201. Plant Biophysics.** Three credit hours: two lectures and one laboratory period. Second term.

An advanced study of the application and operation of physical forces in plant physiology, and the relation of climatic conditions to plant growth. Practice in recording meterological data and the relating of such measurements to plant growth, constitute a part of the course.

**Plt. Phy. 202. Special Problems in Growth and Reproduction.** Two credit hours. Third term.

**Plt. Phy. 203-5. Seminar.** One credit hour each term.

Students are required to prepare reports of papers in the current physiological biochemical literature. These are discussed in connection with recent advances in the subject.

**Plt. Phy. 206. Research.** Credit hours according to work done.

Graduate students taking a major in Plant Physiology may elect physiological chemistry No. 132 and plant bio-chemistry No. 133.

## PLANT PATHOLOGY

### For Undergraduates.

**Plt. Path. 101. General Plant Pathology.** Three credit hours: two lectures and onelaboratory period. First term. Junior year.

An introductory study of the disease of plants. Especial attention is given symptoms, control measures, and microscopic study of the parasites causing diseases. As far as possible choice of material includes representatives of the principal orders of parasitic fungi.

**Plt. Path. 102-104. Methods in Plant Pathology.** Three credit hours each term: one lecture and two laboratory periods. Senior year. Prerequisite, Plt. Path. 101.

The first term presents an introduction to the special methods of investigating plant diseases, culture methods for plant parasites, inoculation experiments, the use of scientific instruments, making records, preparing and illustrating scientific papers. The second term is occupied with the diagnosis of plant diseases, and the third term with methods of treating diseases.

**Plt. Path. 105-107. Advanced Plant Pathology.** Four credit hours each term: two lectures and two laboratory periods. Senior year.

A detailed study of diseases of economic plants. Much of the laboratory work is of experimental nature and students who take pathology as a major can easily find a special problem for thesis material.

**Plt. Path. 108-110. Seminar in Pathology.** One credit hour each term.

Conferences and reports on plant pathological research, special problems and literature.

### For Graduate Students

**Plt. Path. 201. Special Problems In Pathology.** Four credit hours each term.

An advanced study of causal agents, symptoms, diagnosis, and treatment of diseases. Offered for students who have had a thorough training in undergraduate pathology and physiology.

**Plt. Path. 202. Research In Plant Pathology.** Credit arranged according to work done.

Original investigation of special problems.

### For Short-Course Students

**Plt. Path. 1. Plant Diseases.** Three credit hours: two lectures and one laboratory period. First term. Second year.

A practical study of diseases of plants to enable the student to recognize them in the field. A course in sprays and spraying is given in cooperation with Zoology Department in which the student is taught methods of disease control.

## FORESTRY.

The course in Farm Forestry aims to give the student in agriculture sufficient instruction and practice work to enable him to handle intelligently and scientifically the farm woodlands. Such a course should be required of all students fitting themselves for farm management and be given preferably in the spring term (on account of favorable weather for field work) during the Junior or Senior Year for four-year men and during the Second Year for two-year agricultural men. At the present time Forestry is not offered as a major course, but is used to supplement the content of the other courses.

### Description of Courses

**For. 101. Farm Forestry.** Three credit hours: two lectures and one laboratory period. Third term. Prerequisite, Bot. 101.

A study of forest botany, wood management, measurements, fire protection, nursery practice, tree planting, valuation and utilization of forest crops. The work is conducted by means of lectures and field work.

### For Short-Course Students

**For. 1. Farm Forestry.** Three credit hours: two lectures and one laboratory period. Third term.

The content of this course is similar to that of For. 101, but is adapted to the development and needs of students in the short-course work.

## DIVISION OF ANIMAL INDUSTRY

The work of this division consists in giving instruction along the lines of general animal husbandry, dairy husbandry and animal pathology; also of the live stock disease control of the State and the general betterment of live stock conditions in Maryland. The curriculum offered in this division is prepared with the idea of giving the student an opportunity to specialize along animal industry lines and at the same time give him the broad foundations in general agriculture. He is given

such instruction as should enable him (1) to conduct his own farming operations successfully; (2) to secure positions in the various lines of work which demand men trained along animal industry lines.

### Equipment and Facilities for Instruction

The facilities offered by the new building are now being made use of and, as rapidly as machinery and apparatus can be provided and installed, the laboratory instruction in market milk and dairy manufacturing will be emphasized in proportion to the demand for this kind of work.

Herds of cattle and swine are maintained at the University farm and are available for instructional purposes. In addition to these animals, because of the location of the University, it is possible to make use of the excellent herds maintained by Maryland breeders and by the Federal Bureau of Animal Industry, thus giving the student a wide range of material for study. The students are urged, so far as possible, to take advantage of every opportunity to apply in a practical way the instruction given in the classroom. Advanced students are sent throughout the State to supervise advanced registry tests as well as to study general conditions as they exist on some of the leading stock farms of Maryland. These trips give the students an opportunity of observing the most up-to-date farms and farm practices and at the same time bring them into actual contact with the live stock breeders and feeders who are accomplishing the results in this State. Each year judging teams participate in the students' contest in judging dairy cattle and dairy products at the National Dairy Show. Students in any of the agricultural courses are eligible to compete for places on these teams.

**ANIMAL HUSBANDRY.**

| SOPHOMORE YEAR. Term: | I | II | III |
|---|---|---|---|
| Introductory Study of Soils (Soils 101-102) | ..... | 3 | 3 |
| General Geology (Geol. 101) | 3 | ..... | ..... |
| Agricultural Chemistry (Ind. Chem. 101) | ..... | ..... | 4 |
| Organic Chemistry (Gen'l Chem. 112-113) | 3 | 3 | ..... |
| Forage Crops (Agron. 103) | ..... | ..... | 3 |
| Principles of Dairying (D. H. 101) | 3 | ..... | ..... |
| Principles of Breeding (A. H. 104) | ..... | 4 | ..... |
| Feeds and Feeding (A. H. 102) | 4 | ..... | ..... |
| Management of Dairy Young Stock (A. H. 103) | ..... | ..... | 3 |
| Dairy Production (D. H. 102) | ..... | 3 | ..... |
| Basic R. O. T. C. (M. I. 102) | 2 | 2 | 2 |
| Electives | 3 | 3 | 3 |

| JUNIOR YEAR. Term: | I | II | III |
|---|---|---|---|
| Technical Writing (Eng. 104-106) | 2 | 2 | 2 |
| Anatomy and Physiology (V. M. 101) | 3 | ..... | ..... |
| General Bacteriology (Bact. 101-103) | 3 | 3 | 3 |
| Principles of Soil Management (Soils 103) | ..... | 3 | ..... |
| Fertilizers (Soils 104) | ..... | ..... | 4 |
| Swine Production (A. H. 105) | 3 | ..... | ..... |
| Beef Production (A. H. 107) | ..... | 3 | ..... |
| Sheep Production (A. H. 108) | ..... | ..... | 3 |
| Farm Buildings (Str. Des. 107) | 2 | ..... | ..... |
| Gas Engines (M. E. 107) | ..... | 4 | ..... |
| Elective | 4 | 2 | 5 |

SENIOR YEAR.

| | | | |
|---|---|---|---|
| Farm Management (F. M. 101-102) | 3 | 3 | ..... |
| Animal Diseases (V. M. 102) | ..... | 4 | ..... |
| Horse Production (A. H. 109) | 3 | ..... | ..... |
| Tractors ( ) | ..... | ..... | 3 |
| Agricultural Economics (A. E. 103) | ..... | ..... | 3 |
| Animal Genetics (A. H. 113) | 4 | ..... | ..... |
| Nutrition (A. H. 115) | ..... | ..... | 2 |
| Seminar (A. H. 116) | ..... | 1 | ..... |
| Elective | 7 | 9 | 9 |

## DESCRIPTION OF COURSES

**A. H. 101. Animal Husbandry.** Four credit hours: three lectures and one laboratory period. Second term. Freshman year.

Live stock in relation to successful farm practices; types and breeds of farm animals; principles underlying successful live stock husbandry.

**A. H. 102. Feeds and Feeding.** Four credit hours: three lectures and one laboratory period. First term. Sophomore year.

A study of the composition and digestibility of foodstuffs, the source, characteristics and adaptability of the various food stuffs, feeding standards and the calculation of rations.

**A. H. 103. Management of Dairy Young Stock.** Three credit hours: two lectures and one laboratory period. Third term. Sophomore year.

The care, feeding and management of dairy young stock. Methods and practices followed in the development and improvement of the dairy herd so far as relates to breeding and selection. The keeping of herd records, feeding for advanced registry, and barn practice from the standpoint of general herd management. A study of breeds and the judging of dairy cattle.

**A. H. 104. Principles of Breeding.** Four credit hours: three lectures and one laboratory period. Second term. Sophomore year.

This course will cover the practical aspects of animal breeding, including heredity, variation, selection, systems of breeding and pedigree study.

**A. H. 105. Swine Production.** Three credit hours: two lectures and one laboratory period. First term. Junior year.

Types and breeds of swine. Care, feeding, breeding, management, economics of swine husbandry and judging.

**A. H. 106. Meat and Meat Products.** Three credit hours: two lectures and one laboratory period. Second term. Junior year. (Not given 1920-21.)

The slaughtering of farm live stock, and the production, handling, and care of meat on the farm.

**A. H. 107. Beef Porduction.** Three credit hours: two lectures and one laboratory period. Second term. Junior year.

Beef and dual purpose breeds. The care, feeding, breeding and management of beef herds; fattening, fitting for show and economics of the beef industry.

**A. H. 108. Sheep Production.** Three credit hours: two lectures and one laboratory period. Third term. Junior year.

Breeds of sheep, their history and adaptability. Care, feeding, breeding an management. Grades of wool. Judging and scoring.

**A. H. 109. Horse and Mule Production.** Three credit hours: two lectures and one laboratory period. First term. Senior year.

Breeds, their history, characteristics and adaptability. Care, feeding, breeding, breaking and training, judging and fitting for show.

**A. H. 110-111. Advanced Judging.** Two credit hours each term: one lecture and one laboratory period. Second and third terms. Junior or senior years. Prerequisite, A. H. 101 and A. H. 103.

Competitive judging of beef cattle, sheep and swine. During the course various trips to stock farms throughout the State will be made. Such teams as may be chosen to represent the College will be selected from among those taking this course.

**A. H. 112. Advanced Breed Study.** Three credit hours: two lectures and one laboratory period. Third term. Senior year. Prerequisite, A. H. 103, 105, 107, 108.

Special consideration of the history, development, and distribution of the more important breeds of live stock; important families and individuals, assigned reading and pedigree work.

**A. H. 113. Animal Genetics and Statistical Methods.** Four credit hours: three lectures and one laboratory period. First term. Senior or graduate. Prequisite, A. H. 104.

A study of theories regarding the heredity and transmission of characters, pure lines, Mendelism, etc. Correlation and methods of studying hereditary problems.

**A. H. 114. Markets and Marketing.** Three credit hours: two lectures and one laboratory period. Second term. Senior year. Prerequisites, A. H. 106, 108, 109. (Not given in 1920-21.)

History, development, organization and status of the meat, wool, and horse industries. The packing industry and its by-products. Market classes and grades of live stock, markets and study of market reports.

**A. H. 115. Nutrition.** Two credit hours: two lectures. Third term. Seniors or graduates. Prerequisite, A. H. 102.

Composition of the animal body, digestion, assimilation, metabolism, protein and energy requirements. Methods of investigation and studies in the utilization of food nutrients.

**A. H. 116. Seminar.** One credit hour: one lecture. Second term. Senior or graduate students only.

Problems, readings and discussions on subjects relating to animal husbandry.

**A. H. 117-19. Research and Thesis.** Two credit hours each term. Senior year.

Original investigation in problems in animal husbandry. The results of which research are to be presented in the form of a thesis.

### For Short-Course Students

**A. H. 1. Breeds and Judging.** Three credit hours: two lectures and one laboratory period. Second term. First year.

Live stock in relation to successful farm practices, types and breeds of farm animals with special reference to the need of the practical farmer; principles and practices of successful live stock husbandry.

**A. H. 2. Feeds and Feeding.** Four credit hours: three lectures and one laboratory period. Third term. First year.

A study of the source, composition, characteristics and adaptability of the various foodstuffs, feeding and standards and the calculation of rations.

**A. H. 3. Breeding of Animals.** Four credit hours: three lectures and one laboratory period. Second term. Second year.

A course covering the practical aspects of animal breeding, including heredity, variation, selection, systems of breeding and pedigree study.

**A. H. 4-6. Special Animal Husbandry.** Three credit hours: two lectures and one laboratory period. Throughout the second year. Each

term of work is complete in itself and may be elected without regard to the work of the term preceding it or of the term following.

Swine Production: First term. Types and breeds of swine. Care, feeding, breeding management, economics of swine husbandry and judging.

Beef Production: Second term. Subject matter of course same as for "Swine Production."

Sheep Production: Third term. Subject matter of course same as for "Swine Production."

**A. H. 7. Management of Dairy Young Stock.** Three credit hours: two lectures and one laboratory period. Third term. Second year.

The care, feeding and management of dairy young stock. Methods and practices followed in the development of the dairy herd so far as relates to breeding and selection. The keeping of herd records, feeding for advanced registry, and barn practice from the standpoint of general herd management. A study of breeds and the judging of dairy cattle.

## POULTRY HUSBANDRY

**P. H. 101. Farm Poultry.** Four credit hours: three lectures and one laboratory period. Third term. Junior year.

Care of poultry on the general farm; breeds of poultry; breeding, feeding, and selection of stock; incubation, brooking, fattening, killing, marketing, and construction.

### For Short-Course Students

**P. H. 1. Farm Poultry.** Two lectures and one laboratory period. Third term. Second year.

A general course dealing with the care of poultry on the farm; feeding and selection of stock; poultry house construction; fattening, killing, marketing, incubation and breeding.

## DAIRY HUSBANDRY

The courses in Dairy Husbandry are organized with a view to giving the student a working knowledge of the basic principles underlying successful dairy production, market milk, and commercial dairying. Graduates from these courses should be fitted to take up dairy farming, teaching or experiment station work. However, if teaching or investigation is elected, it is advisable for students to remain for the graduate work offered. In the Dairy Husbandry courses use is made of the College of Agriculture herd and newly-equipped milk testing laboratory. A new dairy manufacturing laboratory is in process of completion and should be available during the latter part of the present year.

The Head of this Department has direct charge of the dairy work in the College of Agriculture, Experiment Station and Extension Service.

Official connection with the U. S. Dairy Division also gives the Dairy Husbandry classes free access to the dairy research laboratories of the Government in Washington and the Government Farm herds at Beltsville.

As a State, Maryland has splendid dairy possibilities as yet not fully realized. Fertile soil, long growing seasons, mild winters, and splendid markets made easily accesible by good roads, assure a bright future in the production of dairy cattle and market milk in this State.

Whenever possible dairy students are given opportunities to do advanced registry testing about the state during week-ends and vacations. This service not only pays $3.00 per day for transportation, but gives the dairy student a splendid opportunity to become acquainted with methods of feeding and care practised by the leading breeders of pure-bred cattle within the state. This practice is invaluable to those students intending to go back to their own farm or to engage in the production of pure-bred cattle.

The Department of Dairy Husbandry, supplementing the work of other subject matter departments, offers three major lines of work: (1) Dairy production, covering the care, feeding, and management of dairy cattle; (2) Market Milk, dealing with the factors which control quality and quantity in milk; (3) Commercial Dairying, which takes up the processing and manufacture of dairy products with special reference to the needs of the state in this direction. Sufficient opportunities for electives are given so that men intending to go back to their own farms may register for subjects of prime importance to their own particular farm problems.

**CURRICULA IN DAIRY HUSBANDRY.**

| SOPHOMORE YEAR. Term: | I | II | III |
|---|---|---|---|
| Introductory Soils (Soils 101-102) | ..... | 3 | 3 |
| General Geology (Geo. 101) | 3 | ..... | ..... |
| Organic Chemistry (Gen'l Chem. 112-113) | 3 | 3 | ..... |
| Agricultural Chemistry (Ind. Chem. 101) | ..... | ..... | 4 |
| Public Speaking (104-106) | 1 | 1 | 1 |
| Forage Crops (Agron. 103) | ..... | ..... | 4 |
| Feeds and Feeding (A. H. 102) | 4 | ..... | ..... |
| Principles of Breeding (A. H. 104) | ..... | 4 | ..... |
| Dairy Young Stock (A. H. 103) | ..... | ..... | 3 |
| Principles of Dairying (D. H. 101) | 3 | ..... | ..... |
| Dairy Production (D. H. 102) | ..... | 3 | ..... |
| History of Dairy Cattle (D. H. 103) | ..... | ..... | 2 |
| Basic R. O. T. C. (M. I. 102) | 2 | 2 | 2 |
| Elective | 2 | 4 | 1 |

| JUNIOR YEAR. Term: | I | II | III |
|---|---|---|---|
| Principles of Economics (R. E. 101-102) | 3 | 3 | ..... |
| Technical Writing (Eng. 104-106) | 2 | 2 | 2 |
| General Bacteriology (Bect. 101-103) | 3 | 3 | 3 |
| Soil Bacteriology (Soils 107) | ..... | ..... | 3 |
| Anatomy and Physiology (V. M. 101) | 3 | ..... | ..... |
| Advanced Judging (A. H. 111) | ..... | ..... | 2 |
| Farm Dairying (D. G. 104) | 3 | ..... | ..... |
| Commercial Dairying (D. H. 105) | ..... | 3 | ..... |
| Judging of Dairy Products (D. H. 106) | ..... | ..... | 2 |
| Agricultural Education (105) | ..... | ..... | 3 |
| Farm Accounts (A. E. 106) | ..... | 3 | ..... |
| Electives | 3 | 3 | 2 |

SENIOR YEAR.

| | | | |
|---|---|---|---|
| Forging and Pipe-fitting (Shop 2) | ..... | ..... | 1 |
| Farm Management (F. M. 101) | 3 | ..... | ..... |
| Cooperative Marketing (A. E. 105) | ..... | ..... | 3 |
| Animal Diseases (V. M. 102) | ..... | 4 | ..... |
| Dairy Bacteriology (Bact. 104-106) | 3 | 3 | 3 |
| Market Milk (D. H. 107) | 3 | ..... | ..... |
| Advanced Testing (D. H. 108) | ..... | 3 | ..... |
| Research and Thesis (D. H. 110-112) | 2 | 2 | 2 |
| Electives | 6 | 5 | 8 |

## DAIRY HUSBANDRY

**D. H. 101. Principles of Dairying.** Three credit hours: two lectures and one laboratory period. First term. Sophomore year.

The relationship of dairying to general agriculture; the extent of the dairy business and value of dairy products; milk, its secretion, character and composition and the fundamentals of dairy cattle, care, feeding and management.

**D. H. 102. Dairy Production and Barn Practice.** Three credit hours: two lectures and one laboratory period. Second term. Sophomore or Junior year.

The care, feeding and management of dairy cattle, including feeding standards, the balancing of rations, selections of feeds, systems of herd feeding, silage and silos, soiling systems and pastures, the selection, care and feeding the sire, dairy herd development and management, methods of keeping and forms for herd records, dairy barn construction, arrangement and equipment, requirements for advanced registry and management of tests, dairy cost accounts and barn practices which influence quantity and quality in milk.

**D. H. 103. History and Development of Dairy Cattle.** Two credit hours: two lectures. Third term. Sophomore year.

A study of the origin, history, development and characteristics of the dairy breeds; the value of official records; bull associations, cow testing associations.

**D. H. 104. Farm Dairying.** Three credit hours: two lectures and one laboratory period. First term. Junior year.

Composition of milk, butter and cheese; methods of testing for butterfat and for total solids; equipping the stable and milk house; how bacteria and dirt get into milk; how they may be kept out; surface coolers and precooling; milk cooling tanks; washing and sterilization of utensils.

**D. H. 105. Commercial Dairying.** Three credit hours: one lecture and two laboratory periods. Second term. Junior year. Given in 1920-1921 if equipment is available.

Power separators; pasteurizers; churns and butter workers; the ripening of cream; churning, washing, salting, working, packing, scoring and selling butter.

**D. H. 106. Judging Dairy Products.** Two credit hours: one lecture and one laboratory period. Third term. Junior year.

Competitive judging of milk, butter and cheese. Various outside lecturers on these subjects will address the class and trips will be taken to butter, cheese and milk markets for the purpose of familiarizing the students with the commercial quality of milk, butter and cheese. Such teams as may be chosen to represent the College will be selected from those electing this course.

**D. H. 107. Market Milk.** Three credit hours: two lectures and one laboratory period. First term. Senior year.

A study of market milk conditions; requirements of city milk trade; the production of milk; pasteurization of milk; milk and its relation to the public health; the food value of milk; methods of handling market milk and market cream for direct consumption; the transportation of milk; Babcock testing of milk and milk products. In this course visits will be made to dairies and to milk plants.

**D. H. 108. Advanced Course in Milk Testing.** Three credit hours: one lecture and two laboratory periods. Second term. Senior year.

This course includes the determination of moisture and dry matter in milk and dairy products; various tests for fat and casein; testing of butter and oleomargine, adulterations and preservative.

**D. H. 109. Seminar.** One credit: one lecture. Second Term. Senior year for graduate students.

The Seminar is devoted largely to reports by students on current bulletins and scientific papers in dairy production and market milk problems.

**D. H. 110-112. Research and Thesis.** Six credit hours: to be arranged. Senior year.

Students are given opportunities to conduct investigational work, either in collecting information or original research in Dairy Production and Market Milk.

### For Graduate Students

**D. H. 201. City Milk Supply.** Two credit hours: two lectures. First term. Graduates.

Securing a milk supply for city consumers; methods of buying from producers; the transportation of milk; milk contractors; systems of handling milk in the city milk plants; the sterilization of utensils; systems of delivery to consumers.

**D. H. 202. Dairy Farm and City Milk Inspection.** Two credit hours: two lectures. Second term. Graduates.

Early attempts at control and the development of milk inspection; systems of dairy inspection; systems of milk plant inspection; dairy farm score cords; dairy plant score cards; relation of milk to public health; grading milk; milk standards; milk and cream regulations; methods of appointment and duties of dairy and milk inspectors; general improvement and control of milk supplies of cities and towns.

**D. H. 203. Research.** Nine credits: To be arranged.

With the approval of the head of the department, students will be allowed to work on any problem in dairy production or market milk they may choose, or be given a list of problems from which to select a research project.

In so far as schedules permit, students will be encouraged to visit the U. S. Dairy Division Laboratories and become acquainted with the dairy research problems in process and the methods of attack. This acquaints the student with the broad phases of research in dairy production and market milk.

### For Short-Course Students

**D. H. 1. Principles of Dairying.** Three credit hours: two lectures and one laboratory period. First term. First year.

Relationship of dairying to general agriculture; the extent of the dairy business and value of dairy products; milk, its secretion; character and composition; and fundamentals of dairy cattle, care, feeding and management.

**D. H. 2. Dairy Production and Barn Practice.** Three credit hours: two lectures and two laboratory periods. Second term. Second year.

The care, feeding and management of dairy cattle, including feeding standards, the balancing of rations; selections of feeds, systems of herd feeding, silage and silos, soiling systems and pastures, the selection, care and feeding the sire, dairy herd development and manage-

ment, methods of keeping and forms for herd records, dairy barn construction, arrangement and equipment, requirements for advanced registry and management of tests, dairy cost accounts and barn practices which influence quantity and quality in milk.

**D. H. 3. Farm Dairying.** Three credit hours: two lectures and one laboratory period. First term. Second year.

Composition of milk, butter and cheese; methods of testing for butterfat and for total solids; equipping the stable and milk house; how bacteria and dirt get into milk; how they may be kept out; surface coolers and precooling; milk cooling tanks; washing and sterilization of utensils.

**D. H. 4. Judging of Dairy Products.** Two credit hours: one lecture and one laboratory period. Third term. Second year.

Competitive judging of milk, butter and cheese. Various outside lecturers on these subjects will address the class and trips will be taken to butter, cheese and milk markets for the purpose of familiarizing the students with the commercial quality of milk, butter and cheese. Such teams as may be chosen to represent the University will be selected from those electing this course.

## BACTERIOLOGY

### BACTERIOLOGY.

| SOPHOMORE YEAR. Term: | I | II | III |
|---|---|---|---|
| Feeds and Feeding (A. H. 102) | 4 | ..... | ..... |
| Principles of Breeding (A. H. 104) | ..... | 4 | ..... |
| Principles of Dairying (D. H. 101) | 3 | ..... | ..... |
| Introductory Study (Soils 101-102) | ..... | 3 | 3 |
| Entomology (Zool. 106) | ..... | ..... | 3 |
| Quantitative Analysis (Gen'l Chem. 107-108) | 3 | 3 | ..... |
| Agricultural (Ind. Chem. 101) | ..... | ..... | 4 |
| Organic (Gen'l Chem. 112-113) | 3 | 3 | ..... |
| Basic R. O. T. C. (M. I. 102) | 2 | 2 | 2 |
| Electives | 3 | 3 | 6 |

JUNIOR YEAR.

| | | | |
|---|---|---|---|
| General Plant Pathology (Plt. Path. 101) | 3 | ..... | ..... |
| Farm Dairying (D. H. 103) | ..... | 4 | ..... |
| General (Bact. 101-103) | 3 | 3 | 3 |
| Mycology (Morph. and Mycol. 106) | ..... | ..... | 3 |
| Physiological Chemistry (Bio-Chem. 101) | 4 | ..... | ..... |
| Technical Writing (Eng. 104-106) | 2 | 2 | 2 |
| Economic Entomolgy (Zool. 108) | ..... | 4 | ..... |
| Electives | 5 | 4 | 9 |

| SENIOR YEAR. Term: | I | II | III |
|---|---|---|---|
| Methods in Pathology (Plt. Path. 102) | ..... | 3 | ..... |
| Dairy (Bact. 104-106) | 3 | 3 | 3 |
| Advanced (Bact. 107-109) | 3 | 3 | 3 |
| Market Milk (D. H. 107) | 5 | ..... | ..... |
| Milk Tseting (D. H. 108) | ..... | 4 | ..... |
| Soil Bacteriology (Soils 107) | ..... | ..... | 3 |
| Seminar (Bact. 117-119) | 1 | 1 | 1 |
| Electives | 5 | 3 | 7 |

## BACTERIOLOGY

**Bact. 101-103. General Bacteriology.** Three credit hours each term: one lecture and two laboratory periods. Junior year.

This subject includes the following topics: A brief history of bacteriology; microscopy; bacteria and their relation to nature; morphology, classification, identification of species and the different methods of sterilization and disinfection; preparation of culture media, isolation and cultivation of aerobes and anaerobes; examination of cultures; microscopic examination of bacteria; stains with their composition, classification and use; vital activities of bacteria; their relation to disease; use of experimental animals; bacteria in water, milk and soil; cultural characters of representative organisms from the following genera: micrococcus, streptococcus, bacterium, bacillus, pseudomonas, streptothrix, protozoa, filtrable viruses and immunity.

**Bact. 103-A. Special for Home Economics Students only.** Three credit hours: third term. One lecture and two laboratory periods. Junior year.

The subject matter of the course will consist largely of the study of the more important bacteria, yeasts and fungi ordinarily encountered in the field of domestic economy.

**Bact. 104-106. Dairy Bacteriology.** Three credit hours each term: one lecture and two laboratory periods. Senior year. Prerequisites, Bact. 101-103.

This course deals with the following topics: historical sketch; relation of bacteria to dairy products; preparation of media; plating by the dilution method; sources of contamination, including stable atmosphere, udder, exterior of cows and attendants; kinds of utensils and their sterilization; kinds of bacteria in milk and their development; direct microscopic examination, sedimentation test and centrifugalization, fresh and old milk; baby and special milks, market milk, graded milk; certified milk, sour milk, whey, cream, butter cheese, condensed milk, powdered milk and milk starters; pasteurization by flash and slow method; changes inmilk due to bacteria and milk as a carrier of disease.

**Bact. 107-109. Advanced Bacteriology.** Two to three credit hours each term: two to three laboratory periods. Senior year. Prerequisite, Bact. 101-103.

This course is intended primarily to give the student a chance to develop his own initiative. He will be allowed to decide upon his project and work it out as much as possible in his own way under proper supervision. In this manner he will be able to apply his knowledge of bacteriology to a given problem. He will also get to know something of the methods of research and will receive a valuable training in obtaining careful and accurate data.

**Bact. 110-112. Thesis.** Two credit hours each term: senior year Optional.

The investigation of a given project, the results of which are to be presented in the form of a thesis and submitted for credit toward graduation.

**Bact. 113-115. Seminar.** One credit hour each term: senior year. Required of seniors taking Bact. 107-109 and all graduate students. The work will consist of reports on individual projects and on recent scientific literature.

### For Graduate Students

**Bact. 201-203. Research Bacteriology.** Three credit hours each term: three laboratory periods by assignment. Prerequisite, Bact. 101-103 and in certain cases 104-106 and 107-109, depending upon the project.

### For Short-Course Students

**Bact. 1. Agricultural Bacteriology.** Two credit hours: two lectures. Second term. Second year.

An elementary course touching upon the following topics: The general characters of micro-organisms; fermentation; putrefaction and decay; nature's food supply; the carbon cycle; decomposition of nitrogenous compounds; nitrification and denitrification; the manure heap and sewage; reclamation of lost nitrogen; bacteria and soil minerals; bacteria in water and milk; control of milk supply; bacteria in butter and cheese making; alcohol, vinegar, sour kraut, tobacco, silage and flax; preservation of food products; resistance against parasitic bacteria; tuberculosis and other germ diseases and parasitic diseases of plants.

**PRE-VETERINARY.**

| SOPHOMORE YEAR. Term: | I | II | III |
|---|---|---|---|
| Feeds and Feeding (A. H. 102) | 4 | ..... | ..... |
| Principles of Breeding (A. H. 104) | ..... | 4 | ..... |
| Principles of Dairying (D. H. 101) | 3 | ..... | ..... |
| Introductory Study of Soils (Soils 101-102) | ..... | 3 | 3 |
| General Geology (Geol. 101) | 3 | ..... | ..... |
| Agricultural Chemistry (Ind. Chem. 101) | ..... | ..... | 4 |
| Organic Chemistry (Gen'l Chem. 112-113) | 3 | 3 | ..... |
| Forage Crops (Agron. 103) | ..... | ..... | 3 |
| Management of Dairy Young Stock (A. H. 103) | ..... | ..... | 3 |
| Dairy Production (D. H. 102) | ..... | 3 | ..... |
| Basic R. O. T. C. (M. I. 102) | 2 | 2 | 2 |
| Electives | 3 | 3 | 3 |

JUNIOR YEAR.

| | | | |
|---|---|---|---|
| General Bacteriology (Bact. 101-103) | 3 | 3 | 3 |
| Anatomy and Physiology (V. M. 101) | 3 | ..... | ..... |
| Technical Writing (Eng. 104-106) | 2 | 2 | 2 |
| Swine Production (A. H. 105) | 3 | ..... | ..... |
| Beef Production (A. H. 107) | ..... | 2 | ..... |
| Sheep Production (A. H. 108) | ..... | ..... | 3 |
| Advanced Judging (A. H. 110-111) | ..... | 2 | 2 |
| Electives | 6 | 7 | 7 |

SENIOR YEAR.

| | | | |
|---|---|---|---|
| Dairy Bacteriology (Bact. 104-106) | 3 | 3 | 3 |
| Animal Diseases (V. M. 102) | ..... | 4 | ..... |
| Horse Production (A. H. 109) | 3 | ..... | ..... |
| Animal Genetics (A. H. 113) | 4 | ..... | ..... |
| Nutrition (A. H. 115) | ..... | ..... | 2 |
| Electives | 7 | 10 | 12 |

## VETERINARY MEDICINE

**V. M. 101. Anatomy and Physiology.** Three credit hours: three lectures. First term. Junior year.

A brief study of the structure of the animal body with a view to recognizing the abnormal as contrasted with the normal and to the gaining of a knowledge of the inter-relationships between the various organs and parts, both as to structure and function.

**V. M. 102. Animal Diseases.** Four credit hours: three lectures and one laboratory period. Second term. Senior year.

A brief study of diseases of domestic animals, both infectious and non-infectious. Early recognition of disease; hygiene, sanitation, and prevention; first aid.

**For Short-Course Students.**

**V. M. 1. Animal Diseases.** Three credit hours: two lectures and one laboratory period. Second term. Second year.

Briefer course on the diseases of domestic animals; methods of recognizing disease in its early stages; relation of care and sanitation to disease.

## GENERAL ANIMAL INDUSTRY COURSES

Seminar. A forum for the discussion of subjects relating to animal industry. Open to juniors, seniors and graduate students only.

Research and Thesis. The work will be arranged with each student individually. He may select some topic or problem in which he is especially interested and which will require independent investigation.

## SOILS

The Department of Soils gives instruction in the physics, chemistry, and biology of the soil, the courses being designed to equip the future farmer with a complete knowledge of his soil and also to give adequate training to students who desire to specialize in soils. Students who are preparing to take up research or teaching are expected to take graduate work in addition to the regular undergraduate courses that are offered. The department possesses the necessary equipment and facilities for the instruction in these subjects, and in addition affords opportunities for the student to come in contact with the research of the Agricultural Experiment Station, especially in the pot-culture laboratories and on the experimental fields at the station and in other parts of the State.

Graduate students will find unusual opportunities to fit themselves for teaching soils in agricultural colleges, to conduct research in experiment stations, and to carry on work with the Bureau of Soils, United States Department of Agriculture.

**SOILS.**

| SOPHOMORE YEAR. Term: | I | II | III |
|---|---|---|---|
| Forage Crops (Agron. 103) | ..... | ..... | 4 |
| General Geology (Geol. 101) | 3 | ..... | ..... |
| Soil Physics and Management (Soils 101-102) | ..... | 3 | 3 |
| Organic Chemistry (Gen'l Chem. 112-113) | 3 | 3 | 1 |
| Agricultural Chemistry (Ind. Chem. 101) | ..... | ..... | 4 |
| Plant Physiology (Plt. Phy. 101-102) | 3 | 4 | ..... |
| Physics General (Phys. 104) | 3 | 3 | 3 |
| Basic R. O. T. C. (M. I. 102) | 2 | 2 | 2 |
| Electives | 4 | 3 | 2 |

| JUNIOR YEAR. Term: | I | II | III |
|---|---|---|---|
| Technical Composition (Eng. 104-106) | 2 | 2 | 2 |
| Principles of Economics (Econ. 101-102) | 3 | 3 | ..... |
| General Bacteriology (Bact. 101-102) | 3 | 3 | ..... |
| Soil Bacteriology (Soils 107) | ..... | ..... | 4 |
| Quantitative Analysis (Gen'l Chem. 107-108) | 3 | 3 | ..... |
| Determinative Mineralogy (Gen'l Chem. 120) | ..... | ..... | 3 |
| Fertility and Fertilizers (Soils 103-105) | 3 | 3 | 3 |
| Elective | 3 | 3 | 5 |

SENIOR YEAR.

| | | | |
|---|---|---|---|
| Farm Management (F. M. 101-102) | 3 | 3 | ..... |
| Methods of Crop Investigation (Agron. 106) | 3 | ..... | ..... |
| Crop Rotations (Agron. 109) | ..... | 2 | ..... |
| Soil Survey and Classification (Soils 106) | 3 | ..... | ..... |
| Soil Technology (Soils 111-113) | 3 | 3 | 3 |
| Surveying and Drainage | ..... | ..... | 3 |
| Seminar (Soils 115) | ..... | 1 | 1 |
| Methods of Soil Investigation (Soils 114) | ..... | ..... | 2 |
| Elective | 5 | 8 | 8 |

## Description of Courses

**Geol. 101. General Geology.** Three credit hours: two lectures and one laboratory period. First term.

A text-book, lecture, and laboratory course, dealing with the principles of geology and their application to agriculture. While this course is designed primarily for agricultural students in preparation for technical courses, it may be taken as a part of a liberal education.

**Soils 101-102. Soil Physics and Management.** Three credit hours each term: two lectures and one laboratory period. Second and third terms. Prerequisite, Geol. 101.

The physical and chemical properties of soils in their relation to tillage operations, preparation of seed beds, and the maintenance of soil fertility. Field excursions are made to study soil formation and their physical properties. The practical work consists chiefly of experiments and demonstrations in soil physics.

**Soils 103-105. Soil Fertility and Fertilizers.** Three credit hours each term: one lecture and two laboratory periods. Farm manures the first and second terms; commercial fertilizers the third term. Prerequisite, Soils 101-102.

The object of this course is to familiarize the student with the details of soil management. It includes the practical application of the principles of soil physics to methods of tillage and cropping and a study of the factors governing the use of manures and fertilizers. The practical work includes special studies of the soils from the colleges and station farms that have been subjected to various treatments.

**Soils 106. Soil Surveying and Classification.** Three credit hours: one lecture and two laboratory periods. First term. Prerequisite, Soils, 101-102.

A study of the principal soil regions, series, and types of the United States, and especially of the soils of Maryland, as to formation, composition, and value agriculturally. The practical work consists chiefly in identification of soil types and in map making.

**Soils 107. Soil Bacteriology.** Four credit hours: two lectures and two laboratory periods. Third term. Prerequisite, Bact. 101-102.

A study of the micro-organisms of the soil in relation to fertility. It includes the study of nitrogen transformers, etc., and the injurious soil organisms. The work is carried on in the laboratory, lectures, and library.

**Soils 108-110. Thesis.** Two credit hours. Senior year.

Some special problem is assigned to each student, who is expected to embody the results of the investigation in a thesis.

### For Advanced Undergraduate and Graduate Students

**Soils 111-113. Soil Technology.** Three credit hours each term: one lecture and two laboratory periods. Prerequisites, Soils 101-102, Chem. 101-103.

A study of methods used by experiment stations in soil problems and technique of laboratory manipulation. Laboratory work deals with soil problems in which the student is interested and includes a study of the effect of different manures and fertilizers as determined by pot and plot culture experiments.

**Soils 114. Methods of Soil Investigation.** Two credit hours. Third term.

The course includes a critical study of the methods used by experiment stations in soil investigational work.

**Soils 116-116. Seminar. One credit hour.** Second and third terms.

The seminar periods are devoted largely to the discussion of current bulletins and scientific papers on soil topics.

### For Graduate Students.

**Soils 201-203. Special Problems and Research.** Five to ten credit hours. The year. Lectures and practice to be arranged.

Original investigations of problems in soils and fertilizers.

### For Short-Course Students

**Soils 1. Soil Management.** Three credit hours: two lectures and one laboratory period. Third term.

A study of the physical and chemical conditions of soils in their relation to profitable agriculture. Special attention is given to the application of physics and chemistry to the management of Maryland Soils.

**Soils 2. Manures and Fertilizers.** Three credit hours: two lectures and one laboratory period. First term.

Lectures and recitations on the care and utilization of farm manures; on the sources of fertilizer materials; methods of valuation and the effect of fertilizers on different farm crops.

## FARM EQUIPMENT

The Department of Farm Equipment was organized from an outgrowth of the increased demands for farm machinery and other farm equipment as labor-saving devices.

The department has charge of farm machinery, farm automobiles, trucks and tractors, farm motors and gas engines, farm mechanics, farm buildings, conveniences of the home, and will take up other courses as the needs demand.

## FARM MANAGEMENT

In this department are grouped courses in farm management, agricultural economics, and markets, together with the kindred subject of rural organization.

Farm management has been defined as the business of the individual farmer to so organize his business as to produce the greatest continuous profit. This can be done, however, only when the organization is in accordance with the broader principles of agricultural economics. It requires not only knowledge of the many factors involved in the production of crops and animals, but also administrative ability to properly coordinate them into the most efficient farm organization.

The aim of the farm management course is to assist the student to perceive the just relationship of the several factors of production and disposition as applicable to local conditions and to develop in him executive and administrative capacity. Students well trained in farm management are in demand for county agent work, experiment station or United States Government investigation, and college or secondary school teaching.

Agricultural economics considers the fundamental principles underlying production, distribution, and consumption, more especially as they bear upon agricultural conditions. Labor, land and capital are considered in their relationship to agriculture. The need for more exact business records on the farm is forcing itself imperatively on the minds of all students of agricultural economics. To meet this demand a

course is offered in farm accounting. This course is not elaborate but is designed to meet the demand for a simple yet accurate system of farm business records.

The comparative isolation of country life tends naturally to individual rather than cooperative effort. The course in rural organization aims to show the student the advantages of combined effort in country communities, to sketch the history of rural organization with a discussion of its failures and successes, and to point out practical methods of organizing rural communities for mutual and individual benefit.

## FARM MANAGEMENT.

| SOPHOMORE YEAR. Term: | I | II | III |
|---|---|---|---|
| Introductory Study of Soils (Soils 101-102) | ..... | 3 | 3 |
| General Geology (Geol. 101) | 3 | ..... | ..... |
| Principles of Breeding (A. H. 104) | ..... | 4 | ..... |
| Forage Crops (Agron. 103) | ..... | ..... | 4 |
| Plant Anatomy (Morph. and Myc. 101) | 3 | ..... | ..... |
| Plant Physiology (Plt. Phys. 101-102) | ..... | 4 | 3 |
| Feeds and Feeding (A. H. 102) | 4 | ..... | ..... |
| Meat and Meat Products (A. H. 106) | ..... | 3 | ..... |
| Poultry (P. H. 101) | ..... | ..... | 4 |
| Pomology (Hort. 101) | 4 | ..... | ..... |
| Grain Judging (Agron. 102) | ..... | 1 | ..... |
| Basic R. O. T. C. (M. I. 102) | 2 | 2 | 2 |
| Electives | 2 | 1 | 2 |

### JUNIOR YEAR.

| | | | |
|---|---|---|---|
| Technical English (Eng. 104-106) | 2 | 2 | 2 |
| Principles of Economics (Econ. 101-102) | 3 | 3 | ..... |
| Agricultural Economics (A. E. 101) | ..... | ..... | 3 |
| Fertilizers (Soils 105) | ..... | ..... | 3 |
| Farm Accounting (A. E. 104) | ..... | ..... | 3 |
| Farm Machinery (F. E. 101) | 3 | ..... | ..... |
| Bacteriology (Bact. 101-102) | 3 | 3 | ..... |
| Surveying and Drainage (————————) | ..... | ..... | 4 |
| Grading Grain Crops (Agron. 106) | ..... | 3 | ..... |
| Electives | 6 | 6 | 2 |

### SENIOR YEAR.

| | | | |
|---|---|---|---|
| Farm Management (F. M. 101-102) | 3 | 3 | ..... |
| Markets and Marketing (A. E. 102) | ..... | 3 | ..... |
| Cooperative Marketing (A. E. 103) | ..... | ..... | 3 |
| Community Study (R. O. 101-103) | 2 | 2 | 2 |
| Principles of Rural Organization (R. O. 104) | 3 | ..... | ..... |
| Electives | 9 | 9 | 12 |

### Description of Courses

**F. M. 101-102. Farm Management.** Three credit hours each term: three lectures. First and second term.

A study of the business of farming from the standpoint of the individual farmer. This course aims to connect the principles and practice which the student has acquired in the several technical courses and to apply them to the development of a successful farm business.

## AGRICULTURAL ECONOMICS

**A. E. 101. Studies in Agricultural Economics.** Three credit hours. Third term. Prerequisite, A. E. 101-102.

A study of the economic adaptations and adjustments necessary on the part of the agriculturist to meet the changing economic conditions. Population flows, land tenure, farm incomes, farm labor, agricultural credit, and price movements will receive special consideration.

**A. E. 102. Markets and the Marketing.** Three credit hours. Second term. Prerequisite, A. E. 101-102.

An analysis of the present system of transporting, storing, and distributing farm products and a basis for intelligent direction of effort in increasing the efficiency of marketing methods.

**A. E. 103. Cooperative Marketing.** Three credit hours. Third term. Prerequisite, A. E. 101-102.

A study of the cooperative marketing, endeavors of farmers with a view to developing methods of distributing perishable and specialized farm products.

**A. E. 104. Farm Accounting.** Four credit hours: three lectures and one laboratory period. First term.

A study of the principles underlying farm accounting, emphasizing cost accounting and analysis of farm business.

## RURAL ORGANIZATION

**R. O. 101-103. Elements of Community Study.** Three credit hours each term. The year.

A course dealing with the fundamental principles of community development.

**R. O. 104. Principles of Rural Organization.** Three credit hours. First term.

A study of the historical and comparative development of farmers' cooperative organizations, stressing particularly present tendencies.

### For Short-Course Students

**F. M. 1. Farm Management.** Two lectures and one laboratory period. First term.

A course parallel with F. M. 101-102 arranged for the students of the short agricultural courses.

**A. E. 1. Farm Accounting.** Two lectures. Second Term.
A course parallel with A. E. 106. For students of the short agricultural courses.

**R. O. 1. Rural Organization.** Three lectures. Third term.
A survey of the functions, scope, and present forms of organization of rural interests primarily for economic purposes.

## DEPARTMENT OF ZOOLOGY.

The training of economic zoologists and the preparation of students for entrance to the Medical School is the function of this department, in addition to teaching zoology, as a basic science.

In the preparation of entomologists, the aim is to give a broad training in zoology and allied sciences, with specialization in the senior year. All the work of the State and Station Entomologist is done through this department, thus offering better opportunities for students desiring to specialize in entomology.

The pre-medical curriculum includes the scheduled subjects as prescribed by the Council on Medical Education of the American Medical Association for the two-year pre-medical course. "Students registered for the pre-medical course now offered in the Department of Economic Zoology, may, after the completion of three years' work as prescribed, receive the degree of Bachelor of Science upon the successful completion of the first year in the School of Medicine of the University."

Close cooperation is maintained with the Bureau of Fisheries and the Maryland Conservation Commission in the development and conservation of Maryland's Water Food Resources.

### ZOOLOGY.

| FRESHMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| General Zoology (Zool. 101-102) | 3 | 3 | ..... |
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| General Botany (Bot. 101) | ..... | ..... | 4 |
| Military Instruction (Basic R. O. T. C. 101) | 2 | 2 | 2 |
| Electives | 6 | 6 | 5 |

| SOPHOMORE YEAR. | | | |
|---|---|---|---|
| Histology (Zool. 103) | 4 | ..... | ..... |
| Embryology (Zool. 104-105) | ..... | 4 | 4 |
| General Entomology (Zool. 107) | ..... | ..... | 3 |
| Quant. Analysis (Gen'l Chem. 107-108) | 3 | 3 | ..... |
| General Physics (Phys. 104) | 2 | 2 | 2 |
| General Physics Lab. (Phys. 104) | 1 | 1 | 1 |
| Exposition and Scientific Thought (Eng. 104-106) | 2 | 2 | 2 |
| Military Instruction (Basic R. O. T. C. 102) | 2 | 2 | 2 |
| Electives | 4 | 4 | 4 |

| JUNIOR YEAR. Term: | I | II | III |
|---|---|---|---|
| Insect Morphology (Zool. 108) | 2 | ..... | ..... |
| Economic Entomology (Zool. 109-110) | ..... | 4 | 4 |
| Insecticides and Their Application (Zool. 118) | ..... | 2 | ..... |
| Organic Chemistry (Gen'l Chem. 112-113) | 3 | 3 | ..... |
| General Bacteriology (Bact. 101-103) | 3 | 3 | 3 |
| Electives | 9 | 5 | 10 |

SENIOR YEAR.

| | | | |
|---|---|---|---|
| Bio. Chemistry (101-102) | 4 | ..... | 3 |
| Economic Entomology (Zool. 111-113) | 5 | 5 | 5 |
| Thesis (Zool. 115-117) | 2 | 2 | 2 |
| Electives | 6 | 10 | 7 |

The student must secure the approval of the head of the division in his elections.

## PRE-MEDICAL.

FRESHMAN YEAR.

| | | | |
|---|---|---|---|
| General Zoology (Zool. 101-102) | 3 | 3 | ..... |
| Mammalian Anatomy (Zool. 102-a) | ..... | ..... | 1 |
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| Language (French or German) | 3 | 3 | 3 |
| General Botany (Bot. 101) | ..... | ..... | 4 |
| Military Instruction (Basic R. O. T. C. 101) | 2 | 2 | 2 |
| Electives | 3 | 3 | 1 |

SOPHOMORE YEAR.

| | | | |
|---|---|---|---|
| Histology (Zool. 103) | 4 | ..... | ..... |
| Embryology (Zool. 104-105) | ..... | 4 | 4 |
| Exposition and Scientific Thought (Eng. 104-106) | 2 | 2 | 2 |
| Organic Chemistry (Gen'l Chem. 112-113) | 3 | 3 | ..... |
| Physics 101, 102, 103 | 5 | 5 | 5 |
| Language (French or German | 3 | 3 | 3 |
| Military Instruction (Basic R. O. T. C. 102) | 2 | 2 | 2 |
| Electives | ..... | ..... | 2 |

JUNIOR YEAR.

| | | | |
|---|---|---|---|
| Comparative Morphology of Vertebrates (Zool. 106) | ..... | ..... | 4 |
| Quant. Chemistry (Gen'l Chem. 107-108) | 3 | 3 | ..... |
| General Bacteriology (Bact. 101-103) | 3 | 3 | 3 |
| Language (French or German) | 3 | 3 | 3 |
| General and Applied Psychology (Prin. Ed. 105-106) | ..... | 2 | 2 |
| Electives | 8 | 6 | 5 |

SENIOR YEAR.

| | | | |
|---|---|---|---|
| Bio. Chemistry (101-102) | 4 | ..... | 3 |
| Medical Entomology (Zool. 119) | 3 | ..... | ..... |
| Thesis (Zool. 115-117) | 2 | 2 | 2 |
| Advanced Bacteriology (Bact. 104-106) | 2 | 2 | 2 |
| Language | 3 | 3 | 3 |
| Electives | 3 | 10 | 7 |

The student must secure the approval of the head of the division in his elections.

## For Undergraduates

**Zool. 101-102. General Zoology.** Three credit hours: two lectures and two laboratory periods. First and second terms.

The relationships of animals, their general form and structure, their responses to environing conditions and their development and evolution are discussed in a broad manner.

**Zool. 102a. Mammalian Anatomy.** One credit hour: one laboratory period. Third term. Prerequisite, Zool. 101-102.

Required of pre-medical students.

**Zool. 103. Normal Histology.** Four credit hours: two lectures and two laboratory periods. First term. Prerequisite, Zool, 101-102.

A study of the normal tissues, chiefly of the mammals; covers the ground usually assigned to general histology.

**Zool. 104-105. Embryology.** Four credit hours each term: two lectures and two laboratory periods. Second and third terms. Prerequisite, Zool. 101-102.

This course is based on the chick.

**Zool. 106. Comparative Morphology of Vertebrates.** Two to four credit hours: laboratory periods to be arranged. Third term. Prerequisite, Zool. 103-105.

Lectures and laboratory work on one or more of the following systems of organs: skeletal, nervous, and circulatory.

**Zool. 107. Entomology.** Three credit hours: two lectures and one laboratory period. Third term. Prerequisite, Zool. 101-102.

General principles of structural and systematic entomology. Lectures, recitations, laboratory work and field excursions. A collection of insects is required, properly arranged to orders.

**Zool. 108. Insect Morphology.** Two credit hours: two laboratory periods. First term. Prerequisite, Zool. 107.

A course in morphology designed to prepare students for work in economic entomology.

**Zool. 109-110. Economic Entomology.** Four credit hours each term: two lectures and two laboratory periods. Second and third terms. Prerequisite, Zool. 107.

Morphology of type insects to acquaint the student with special structures bearing on insect control; insect biology, including methods of study. The theory and practice of insect control.

**Zool. 111-113. Economic Entomology.** Five credit hours each term: three lecture hours and two laboratory periods. The year. Prerequisite, Zool. 109-110.

Problems in applied entomology, including life history, ecology, distribution, parasitism and control.

**Zool. 114. Systematic Entomology.** Two credit hours: two laboratory periods. First term.

The student selects some group in which he is particularly interested and makes a detailed study of it. The course requires considerable field work and is supplemented by laboratory periods and frequent conferences.

**Zool. 115-117. Thesis.** Two credit hours each term: laboratory periods to be arranged. The year.

The intensive investigation of some zoological subject, the results of which are incorporated in a paper which is submitted as part requirement for graduation.

**Zool. 118. Insecticides And Their Application.** Two credit hours: one lecture and one laboratory period. Second term.

The principles of insecticides, their chemistry, preparation and application; construction, care and use of spray and dusting machinery; fumigation and mechanical controls.

**Zool. 119. Medical Zoology.** Three credit hours: three lectures. tures. First term. Prerequisite, Zool. 101-102.

The relation of animals to disease, directly and as vectors of pathogenic organisms; the control of pests of man.

**Zool. 120-121. Scientific Delineation And Preparations.** One credit hour each term: one laboratory period. First and second terms.

Photography, photomicrography, drawing freehand and with camera lucida, lantern-slide making, optical projection, preparation of exhibit and museum material.

**Zool. 122. Horticultural Entomology.** Three credit hours: two lectures and one laboratory period. Third term. Prerequisite, Zool. 106.

Lectures, laboratory and field work on the morphology, biology and control of insect pests of horticultural crops.

**Zool. 123-125. Seminar.** One credit hour each term: one lecture. The year. The staff.

Meetings to discuss zoological topics; to review the literature of the subject and in general to acquaint the student with his chosen field.

**Zool. 126. Introduction to Agriculture.** Credit hours and laboratory periods to be arranged. Not offered in 1920-21. Prerequisite, Zool. 101-102 and Botany 101.

The biology of the fresh and tidal waters of Maryland. A qualitative study of the aquatic organisms with special reference to their possibilities in sustaining aquatic life.

### For Graduate Students

**Zool. 201. Investigations in Entomology.** Credit according to work done.

Studies of minor problems in morphology, taxonomy and applied entomology under the direction of a member of the staff, with particular reference to preparation for individual research.

**Zool. 202. Research in Entomology.** Credit according to work done.

Advanced students having sufficient preparation may, with the approval of the head of the division, undertake supervised research in morphology, taxonomy or biology and control of insects. Frequently the student may be allowed to work on Station or State Horticultural Department projects. The student's work may form a part of the final report on the project and be published in bulletin form.

**Zool. 203. Advanced Economic Entomology.** One credit hour: one lecture. Second term.

Lectures discussing the latest theories and practices in applied entomology.

### For Short-Course Students

**Zool. 1. Animal Pests.** Two lectures and two hours laboratory. Second term.

A study of the wild animals of the farm with practice in identification; designed to enable the farmer to recognize the beneficial and noxious animals on Maryland farms.

**Zool. 2. Sprays and Spraying.** One lecture and three hours laboratory. Third term.

Preparation and application of insecticides, together with a consideration of other methods of control.

**Zool. 3. Beekeeping.** One laboratory period. Third term.

Consideration of the underlying principles of successful beekeeping, with practice in preparation of equipment and the manipulation of bees. Not offered 1920-21.

## SHORT COURSES IN AGRICULTURE

A. Students who have had four years of high school training or its equivalent may follow a two-year curriculum of regular college courses designated by the dean. A certificate is granted by the college upon completion of the work. If, after the student has been awarded a certificate, he is desirous of taking work for a degree, he may continue for two more years with a regular college curriculum.

B. Another two-year curriculum, commonly known as "The Two-Year Agricultural Course," is sub-collegiate in nature. To enter this two-year work the applicant must have preparation at least equal to the work given in the seventh grade of the Maryland public schools. At the conclusion of the course students having completed the regular work as outlined are given a certificate stating the studies pursued during the time spent in the college. No college credit toward a degree is given for work done in this course.

**TWO-YEAR AGRICULTURE.**

| FIRST YEAR. Term: | I | II | III |
|---|---|---|---|
| Cereal Crops (Agron. 1) | 3 | | |
| Forage Crops (Agron. 2) | | | 3 |
| General Soils (Soils 1) | | | 3 |
| Principles of Dairying (D. H. 1) | 3 | | |
| Breeds and Judging of Live Stock (A. H. 1) | | 3 | |
| Feeds and Feeding (A. H. 2) | | | 3 |
| General Chemistry (Gen'l Chem. 1) | 3 | 3 | |
| Elementary Pomology (Hort. 1) | 3 | | |
| Landscape and Floriculture (Hort. 9) | | 3 | |
| Home Vegetable Gardening (Hort. 5) | | | 3 |
| General Botany (Bot. 1) | 3 | | |
| Animal Pests (Zool. 1) | | 3 | |
| Sprays and Spraying (Zool. 2) | | | 2 |
| Farm Drawing (Dr. 1) | 1 | | |
| Farm Woodwork (Shop 1) | 1 | | |
| Forging and Pipe-fitting (Shop 2) | | | 1 |
| Composition (Eng. 1-2) | 3 | 3 | |
| Vocational Publications (Eng. 3) | | | 2 |
| R. O. T. C. (M. I. 1) | 2 | 2 | 2 |
| **SECOND YEAR.** | | | |
| Grain Judging (Agron. 3) | | 1 | |
| Breeds of Animals (A. H. 3) | 3 | | |
| Animal Diseases (D. M. 1) | | 3 | |
| Farm Poultry (P. H. 1) | | | 3 |
| Farm Management (F. M. 1) | 3 | | |
| Farm Accounts (A. E. 1) | | 2 | |
| Rural Organization (R. O. 1) | | | 3 |
| Dairy Production and Barn Practice (D. H. 2) | | 3 | |
| Fertilizers (Soils 2) | 3 | | |
| Plant Diseases (Plt. Path. 1) | 3 | | |
| Bacteriology (Bact. 1) | | 2 | |
| Farm Forestry (For. 1) | | | 3 |
| Farm Machinery (F. E. 1) | | 3 | |
| Farm Buildings | | 2 | |
| Drainage | | | 3 |
| Elect one or a portion of each: | | | |
| Advanced Agronomy (Agron. 4) | 3 | 3 | 3 |
| Special Animal Husbandry (A. H. 4-6) | 3 | 3 | 3 |
| Farm Dairying (D. H. 3) | 3 | | |
| Judging of Dairy Products (D. H. 4) | | | 3 |
| Commercial Fruit Growing (Hort. 2-3) | 4 | 4 | |
| Small Fruits (Hort. 4) | | | 3 |
| Commercial Vegetable Gardening (Hort. 6-8) | 3 | 3 | 3 |
| Commercial Floriculture (Hort. 10-12) | 3 | 3 | 3 |
| Gas Engines | | | 3 |
| Beekeeping (Zool. 3) | | | 1 |

# THE SCHOOL OF ENGINEERING

The engineering group includes, in addition to the departments of Civil, Electrical and Mechanical Engineering, the departments of Mathematics and Physics.

Courses leading to the degree of Bachelor of Science are offered in Civil, Electrical, Mechanical and Rural Engineering, respectively. An outline of each is found on the succeeding pages. The four-year courses are arranged with a view to preparing the student for immediate usefulness in the technical world. The fundamental principles are emphasized through lectures, recitations and practical exercises in the laboratory, drafting room, shop and field. The courses allow some latitude in the selection of subjects in the senior year, particularly in Civil Engineering in which an opportunity to specialize in Highway or Sanitary Engineering is afforded, but in the main they are fixed in character, since experience indicates that the faculty is better qualified to select the subjects to be studied than the average undergraduate. The curriculums include studies which provide a broad general culture as well as a good foundation for technical engineering. Emphasis is placed on the necessity for the development of self-reliance, honest and accurate methods of work, and good judgment in addition to the mastering of the scientific laws underlying the profession of engineering and applying them. The general policy of the School is to keep in close touch with and to advance the best interests of the students at all times. To promote this policy some member of the school faculty is assigned to act as the advisor of each student who registers. Students are expected to consult their advisors concerning any subject in which they may be interested, while the advisors keep themselves informed as to the progress and general welfare of the students.

## INSTRUCTION

The school is organized, first, to instruct the students who desire to practice engineering as a profession, and, second, to teach students interested in agriculture and applied science, such branches of mechanic arts and engineering as will promote their individual interests. Instruction in certain subjects required under the provisions of the Smith-Hughes Act for the training of teachers in the industrial arts will be given.

The demand for instruction in the mechanic arts and the elementary applications of engineering on the part of those who, for any reason, are unable to enter the four-year courses is met by the establishment of the two-year course in which several options are allowed. This is a practical course for which University credit is not given.

An opportunity is afforded each year for practicing road engineers to take an intensive course in road building and maintenance, and for persons attending the short courses in agriculture to obtain instruction in farm machinery, woodwork, the mixing and placing of concrete, etc.

The work in the departments of Mathematics and Physics is developed with a view both to its cultural and its utilitarian value. The utilitarian point of view is probably more emphasized because scientific training is so largely dependent on these subjects, particularly mathematics. Their value, however, in mental training and in general culture is clearly presented to the students.

## SUMMER WORK AND INSPECTION

In addition to the work given during the regular session, summer work covering 100 hours of field, laboratory, shop or office practice is required of members of the freshman class. This work will be developed to include also a specified amount of time at the close of the sophomore and junior years. Summer employment will be accepted as a substitute for this work, if found to be equivalent.

The proximity of the School to Baltimore and Washington and to other places where there are great industrial enterprises offers an excellent opportunity for engineering students to observe what is being done in their chosen field. An instructor accompanies students on all trips of inspection.

Information and advice is given to farmers and others interested concerning drainage, sanitation, water supply, lighting, farm machinery and other small engineering problems whenever possible, although neither an experiment station nor an extension department in engineering has as yet been established.

## OUTLINE OF COURSES OFFERED

The normal curriculum of each four-year course is outlined on the following pages. Students are also required to attend and take part in the meetings of the Engineering Society and Seminar or lectures at which problems relating to engineering in its many phases are discussed.

### CIVIL ENGINEERING.

| FRESHMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| Trigonometry or Solid Geometry (Math. 101 or 102) | 5 | ..... | ..... |
| Analytics (Math 103) | ..... | 5 | 5 |
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Public Speaking (P. S. 101-103) | 1 | 1 | 1 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| Plane Surveying (Surv. 101-102) | ..... | 2 | 1 |
| Freehand Drawing (Dr. 101) | 1 | ..... | ..... |
| Mechanical Drawing (Dr. 103) | 2 | 1 | ..... |
| Engineering Drawing (Dr. 104) | ..... | 1 | ..... |
| Descriptive Geometry (Dr. 105) | ..... | ..... | 3 |
| Woodwork (Shop 103) | 1 | ..... | ..... |
| R. O. T. C. (M. I. 101) | 2 | 2 | 2 |

| SOPHOMORE YEAR. Term: | I | II | III |
|---|---|---|---|
| Advanced Algebra (Math. 104) | 3 | ..... | ..... |
| Calculus (Math. 105) | 2 | 5 | 5 |
| Mechanics and Sound (Phys. 101 and Phys. Lab. 101) | 5 | ..... | ..... |
| Electricity and Magnetism (Phys. 102 and Phys. Lab. 102) | ..... | 5 | ..... |
| Light and Heat (Phys. 103 and Phys. Lab. 103) | ..... | ..... | 5 |
| Determinative Mineralogy | ..... | ..... | 2 |
| Plane Surveying (Surv. 103-104) | 3 | ..... | ..... |
| Advanced Surveying (Surv. 105-106) | ..... | 4 | 1 |
| Graphic Statics (Mech. 101) | ..... | 3 | ..... |
| Analytical Mechanics (Mech. 102) | ..... | ..... | 3 |
| Descriptive Geometry (Dr. 106) | 4 | ..... | ..... |
| Drafting (Dr. 108) | ..... | ..... | 1 |
| R. O. T. C. (M. I. 102) | 2 | 2 | 2 |

JUNIOR YEAR.

| | | | |
|---|---|---|---|
| Oral Technical English (P. S. 116-118) | 1 | 1 | 1 |
| Current History (H. 101-103) | 1 | 1 | 1 |
| Modern Language | 3* | 3* | 3* |
| Topographic Surveying (Surv. 107) | 1 | ..... | ..... |
| Railway Curves and Earth Work (Rwys. 101-102) | ..... | 3 | 2 |
| Railway Surveying (Rwys. 103) | ..... | ..... | 2 |
| Highways (Hwys. 101) | 2 | ..... | ..... |
| Mechanics of Engineering (Mech. 103-104) | 5 | 2 | 2 |
| Materials of Construction (Mech. 105) | ..... | 2 | ..... |
| Hydraulics (Hyd. 101-102) | ..... | ..... | 4 |
| Shades, Shadows, Perspective (Dr. 109-110) | 2 | 2 | ..... |
| Elementary Structural Design (Str. Des. 101) | ..... | 3 | 3 |
| Dynamos and Motors (E. E. 111) | 2 | ..... | ..... |
| Electrical Engineering Laboratory (El. Lab. 102) | 1 | ..... | ..... |
| Testing (Exp. Lab. 101) | ..... | 1 | ..... |
| R. O. T. C. (M. I. 103) | 3* | 3* | 3* |

*Alternative.

SENIOR YEAR.‡

| | | | |
|---|---|---|---|
| Differential Equations (Math. 112) | ..... | 3† | ..... |
| Least Squares (Math. 113) | ..... | ..... | 2† |
| Estimates of Cost (Math. 114) | 1 | ..... | ..... |
| Astronomy (Math. 115) | ..... | 3† | ..... |
| Oral Technical English (P. S. 119-121) | 1 | 1 | 1 |
| Principles of Economics (Econ. 101-102) | 3 | 3 | ..... |
| Engineering Law (Pol. Sci. 118) | ..... | ..... | 3 |
| Modern Language | 3* | 3* | 3* |
| Engineering Geology (Geol. 102) | ..... | ..... | 3† |
| Geodesy (Surv. 108-109) | ..... | ..... | 3† |
| Railway Economics (Rwys. 104) | ..... | 3† | ..... |
| Highway Engineering (Hwys. 102) | ..... | 3† | 4† |
| Materials Laboratory (Hwys. 103) | ..... | ..... | 1† |
| Hydromechanics (Hyd. 103) | 3 | ..... | ..... |
| Elements of Sanitary Engineering (Hyd. 104) | 3 | ..... | ..... |
| Water Supply (Hyd. 105) | ..... | 3† | ..... |
| Sewerage (Hyd. 106) | ..... | ..... | 4† |
| Hydraulic Design (Hyd. 107) | ..... | ..... | 1† |
| Structural Design (Str. Des. 102) | 3 | 3 | 3 |
| Masonry and Concrete (Str. Des. 104) | ..... | 5 | ..... |
| Heating and Ventilation (M. E. 106) | ..... | ..... | 3† |
| Cement Testing (Exp. Lab. 103) | 1 | ..... | ..... |
| R. O. T. C. (M. I. 104) | 3* | 3* | 3* |

*Alternative.

†Electives to be selected with the approval of the Dean to supply the necessary credits.

‡Senior Year for Class 1921 as in Catalogue for 1919-20.

## ELECTRICAL ENGINEERING.

| FRESMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| Trigonometry or Solid Geometry (Math. 101 or 102) | 5 | ..... | .... |
| Analytics (Math. 103) | ..... | 5 | 5 |
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Public Speaking (P. S. 101-103) | 1 | 1 | 1 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| Plane Surveying (Surv. 101-102) | ..... | 2 | 1 |
| Freehand Drawing (Dr. 101) | 1 | ..... | ..... |
| Mechanical Drawing (Dr. 103) | 2 | 1 | ..... |
| Descriptive Geometry (Dr. 105) | ..... | ..... | 3 |
| Woodwork (Shop 102) | 1 | 1 | ..... |
| R. O. T. C. (M. I. 101) | 2 | 2 | 2 |
| **SOPHOMORE YEAR.** | | | |
| Advanced Algebra (Math. 104) | 3 | ..... | ..... |
| Calculus (Math. 105) | 2 | 5 | 5 |
| Mechanics and Sound (Phys. 101 and Phys. Lab. 101) | 5 | ..... | ..... |
| Electricity and Magnetism (Phys. 102 and Phys. Lab. 102) | ..... | 5 | ..... |
| Heat and Light (Phys. 103 and Phys. Lab. 103) | ..... | ..... | 5 |
| Graphic Statics (Mech. 101) | ..... | 3 | ..... |
| Analytical Mechanics (Mech. 102) | ..... | ..... | 3 |
| Descriptive Geometry (Dr. 106) | 4 | ..... | ..... |
| Drafting (Dr. 109) | ..... | ..... | 1 |
| Electricity and Magnetism (E. E. 101) | ..... | 2 | 2 |
| Electrical Engineering Laboratory (El. Lab. 101) | ..... | 1 | 1 |
| Steam Engines (M. E. 102) | 3 | ..... | ..... |
| Blacksmithing (Shop 106) | ..... | 1 | ..... |
| R. O. T. C. (M. I. 102) | 2 | 2 | 2 |
| **JUNIOR YEAR.** | | | |
| Oral Technical English (P. S. 116-118) | 1 | 1 | 1 |
| Current History (H. 101-103) | 1 | 1 | 1 |
| Modern Language | 3* | 3* | 3* |
| Mechanics of Engineering (Mech. 103) | 5 | ..... | ..... |
| Hydraulics (Hyd. 101) | ..... | ..... | 3 |
| Direct Current Theory (E. E. 102) | 3 | 3 | ..... |
| Dynamos and Alternating Currents (E. E. 103) | ..... | ..... | 3 |
| Wireless Telegraphy (E. E. 108) | ..... | 1 | ..... |
| Primary and Secondary Batteries (E. E. 110) | ..... | 2 | ..... |
| Direct Current Design (E. Des. 101) | ..... | ..... | 5 |
| Electrical Engineering Laboratory (El. Lab. 104) | 2 | 1 | 2 |
| Wireless Laboratory (El. Lab. 107) | ..... | 1 | ..... |
| Elementary Machine Design (M. Des. 101) | 2 | ..... | ..... |
| Machine Design (M. Des. 102) | ..... | 3 | ..... |
| Machine Work (Shop 111) | 1 | 1 | ..... |
| Testing (Exp. Lab. 101) | ..... | 1 | ..... |
| R. O. T. C. (M. I. 103) | 3* | 3* | 3* |
| **SENIOR YEAR.†** | | | |
| Oral Technical English (P. S. 119-121) | 1 | 1 | 1 |
| Principles of Economics (Econ. 101-102) | 3* | 3* | ..... |
| Engineering Law (Pol. Sci. 118) | ..... | ..... | 3 |
| Modern Language | 3* | 3* | 3* |
| Hydromechanics (Hyd. 103) | 3 | ..... | ..... |
| Alternating Currents (E. E. 104) | 3 | 3 | 3 |
| Lighting and Illumination (E. E. 105) | ..... | ..... | 3 |
| Electric Power Plants (E. E. 106) | ..... | 3 | ..... |
| Telephones and Telegraphs (E. E. 107) | ..... | 2 | ..... |
| Electric Railways (E. E. 108) | ..... | ..... | 3 |
| Alternating Current Design (E. Des. 102) | 1 | ..... | ..... |
| Electrical Laboratory (El. Lab. 105) | 2 | 2 | 2 |
| Telephone Laboratory (El. Lab. 106) | ..... | 1 | ..... |
| Heat Engineering (M. E. 104) | 2 | ..... | ..... |
| R. O. T. C. (M. I. 104) | 3* | 3* | 3* |

*Alternative.
†Senior Year for Class 1921 as in Catalogue for 1919-20.

## MECHANICAL ENGINEERING.

| FRESMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| Trigonometry or Solid Geometry (Math. 101 or 102) | 5 | ..... | 5 |
| Analytics (Math. 103) | ..... | 5 | ..... |
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Public Speaking (P. S. 101-103) | 1 | 1 | 1 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| Freehand Drawing (Dr. 101) | ..... | 1 | ..... |
| Mechanical Drawing (Dr. 102) | 1 | 1 | ..... |
| Descriptive Geometry (Dr. 105) | ..... | ..... | 3 |
| Technical Instruction (M. E. 101) | 1 | 1 | ..... |
| Woodwork (Shop 101) | 1 | 2 | 1 |
| R. O. T. C. (M. I. 101) | 2 | 2 | 2 |
| **SOPHOMORE YEAR.** | | | |
| Advanced Algebra (Math. 104) | 3 | ..... | ..... |
| Calculus (Math. 105) | 2 | 5 | 5 |
| Mechanics and Sound (Phys. 101 and Phys. Lab. 101) | 5 | ..... | ..... |
| Electricity and Magnetism (Phys. 102 and Phys. Lab. 102) | ..... | 5 | ..... |
| Heat and Light (Phys. 103 and Phys. Lab. 103) | ..... | ..... | 5 |
| Graphic Statics (Mech. 101) | ..... | 3 | ..... |
| Analytical Mechanics (Mech. 102) | ..... | ..... | 3 |
| Descriptive Geometry (Dr. 106) | 4 | ..... | ..... |
| Drafting (Dr. 108) | ..... | ..... | 1 |
| Steam Engines (M. E. 102) | 3 | ..... | ..... |
| Technical Mechanics (M. E. 103) | ..... | 2 | ..... |
| Blacksmithing (Shop 105) | ..... | 2 | ..... |
| Foundry (Shop 108) | ..... | ..... | 2 |
| Machine Work (Shop 109) | ..... | ..... | 1 |
| R. O. T. C. (M. I. 102) | 2 | 2 | 2 |
| **JUNIOR YEAR.** | | | |
| Oral Technical English (P. S. 116-118) | 1 | 1 | 1 |
| Current History (H. 101-103) | 1 | 1 | 1 |
| Modern Language | 3* | 3* | 3* |
| Mechanics of Engineering (Mech. 103-104) | 5 | 2 | 2 |
| Materials of Construction (Mech. 105) | ..... | 2 | ..... |
| Hydraulics (Hyd. 101) | ..... | ..... | 3 |
| Dynamos and Motors (E. E. 111-112) | 2 | 2 | ..... |
| Electrical Engineering Laboratory (El. Lab. 102-103) | 1 | 1 | ..... |
| Elementary Machine Design (M. Des. 101) | 2 | ..... | ..... |
| Machine Design (M. Des. 102-103) | ..... | 3 | 4 |
| Kinematics of Machinery (M. Des. 104) | ..... | ..... | 3 |
| Machine Work (Shop 110) | 3 | 2 | ..... |
| Testing (Exp. Lab. 101) | ..... | 1 | ..... |
| Experimental Engineering (Exp. Lab. 102) | ..... | ..... | 1 |
| R. O. T. C. (M. I. 103) | 3* | 3* | 3* |
| **SENIOR YEAR.‡** | | | |
| Differential Equations (Math. 107) | ..... | 3† | ..... |
| Oral Technical English (P. S. 119-121) | 1 | 1 | 1 |
| Principles of Economics (Econ. 101-102) | 3 | 3 | ..... |
| Engineering Law (Pol. Sci. 118) | ..... | ..... | 3 |
| Modern Language | 3* | 3* | 3* |
| Technical Analysis ( ) | ..... | ..... | ..... |
| Hydromechanics (Hyd. 103) | 3 | ..... | ..... |
| Water Supply (Hyd. 105) | ..... | 3† | ..... |
| Structural Design (Str. Des. 103) | 4 | 3 | 4 |
| Heat Engineering (M. E. 104-105) | 2 | 3 | 3 |
| Heat and Ventilation (M. E. 106) | ..... | ..... | 3 |
| Marine Engineering (M. E. 107) | ..... | ..... | 2† |
| Steam Turbines (M. E. 108) | ..... | ..... | 2† |
| Cement Testing (Exp. Lab. 103) | 1 | ..... | ..... |
| Experimental Engineering (Exp. Lab. 104) | 1 | 2† | 1 |
| R. O. T. C. (M. I. 104) | 3* | 3* | 3* |

*Alternative.

†Electives to be selected with the approval of the Dean to supply the necessary credits.

‡Senior Year for Class 1921 as in Catalogue for 1919-20.

## RURAL ENGINEERING.

| FRESHMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| Trigonometry or Solid Geometry (Math. 101 or 102) | 5 | | |
| Analytics (Math. 103) | | 5 | 5 |
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Public Speaking (P. S. 101-103) | 1 | 1 | 1 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| Plane Surveying (Surv. 101-102) | | 2 | 1 |
| Freehand Drawing (Dr. 101) | 1 | | |
| Mechanical Drawing (Dr. 103) | 2 | 1 | |
| Engineering Drawing (Dr. 104) | | 1 | |
| Descriptive Geometry (Dr. 105) | | | 3 |
| Woodwork (Shop 102) | 1 | | |
| R. O. T. C. (M. I. 101) | 2 | 2 | 2 |

| SOPHOMORE YEAR. | | | |
|---|---|---|---|
| Advanced Algebra (Math. 104) | 3 | | |
| Calculus (Math. 105) | 2 | 5 | 5 |
| Mechanics and Sound (Phys. 101 and Phys. Lab. 101) | 5 | | |
| Electricity and Magnetism (Phys. 102 and Phys. Lab. 102) | | 5 | |
| Heat and Light (Phys. 103 and Phys. Lab. 103) | | | 5 |
| Plane Surveying (Surv. 103-104) | 3 | | |
| Graphic Statics (Mech. 102) | | 3 | |
| Analytical Mechanics (Mech. 101) | | | 3 |
| Descriptive Geometry (Dr. 106) | 4 | | |
| Drafting (Dr. 110) | | | 1 |
| Electricity and Magnetism (E. E. 101) | | 2 | 2 |
| Electrical Engineering Laboratory (El. Lab. 101) | | 1 | 1 |
| Blacksmithing (Shop 106) | | 1 | |
| R. O. T. C. (M. I. 102) | 2 | 2 | 2 |

| JUNIOR YEAR. | | | |
|---|---|---|---|
| Oral Technical English (P. S. 116-118) | 1 | 1 | 1 |
| Current History (H. 101-103) | 1 | 1 | 1 |
| Modern Language | 3* | 3* | 3* |
| Mechanics of Engineering (Mech. 103) | 5 | | |
| Hydraulics (Hyd. 101) | | | 3 |
| Elementary Structural Design (Str. Des. 101) | | 3 | 3 |
| Lights and Illumination (E. E. 105) | | | 3 |
| Electrical Engineering Laboratory (El. Lab. 102) | 1 | | |
| Elementary Machine Design (M. Des. 101) | 2 | | |
| Machine Work (Shop 111) | 1 | 1 | |
| Testing (Exp. Lab. 101) | | 1 | |
| Electives in Agriculture | 4 | 8 | 4 |
| R. O. T. C. (M. I. 103) | 3* | 3* | 3* |

| SENIOR YEAR.‡ Term: | I | II | III |
|---|---|---|---|
| Estimates of Cost (Math. 108) | 1 | ..... | ..... |
| Oral Technical English (P. S. 119-121) | 1 | 1 | 1 |
| Principles of Economics (Econ. 101-102) | 3 | 3 | ..... |
| Engineering Law (Pol. Sci. 118) | ..... | ..... | 3 |
| Modern Language | 3* | 3* | 3* |
| Farm Forestry (For. 101) | ..... | ..... | 3 |
| Engineering Geology (Geol. 102) | ..... | ..... | 3† |
| Highways (Hwys. 101) | 2 | ..... | ..... |
| Hydromechanics (Hyd. 103) | 3† | ..... | ..... |
| Elements of Sanitary Engineering (Hyd. 104) | 3† | ..... | ..... |
| Advanced Drainage (Hyd. 110) | ..... | ..... | 2† |
| Design of Farm Structures (Str. Des. 105) | ..... | 3† | 3† |
| School Architecture (Str. Des. 106) | ..... | ..... | 4† |
| Telephones and Telegraphs (E. E. 107) | ..... | 2† | ..... |
| Primary and Secondary Batteries (E. E. 110) | ..... | 2 | ..... |
| Telephone Laboratory (El. Lab. 106) | ..... | 1† | ..... |
| Design of Farm Machinery (M. Des. 105) | ..... | 3† | 3† |
| Steam Engines (M. E. 102) | 3† | ..... | ..... |
| Heating and Ventilation (M. E. 106) | ..... | ..... | 3 |
| Cement Testing (Exp. Lab. 103) | 1 | ..... | ..... |
| Electives in Agriculture | 7† | 3† | 2† |
| R. O. T. C. (M. I. 104) | 3* | 3* | 3* |

*Alternative.

†Electives to be selected with the approval of the Dean to supply the necessary credits.

‡Senior Year for Class 1921 as in Catalogue for 1919-20.

## DESCRIPTION OF SUBJECTS OFFERED

The subjects offered in the different departments of the school are divided into groups, each of which is given a title more or less indicative of the subjects included in it. An abbreviation of this title is placed before each subject in the group. This is used with the subject title in the tabulated outline of the curriculum of each course.

## DRAWING AND DESCRIPTIVE GEOMETRY

**Dr. 101. Freehand Drawing.** One credit hour: one laboratory period. First term.

Elementary practice; letering, exercises in sketching, both in pencil outline and pencil rendering; line drawing, composition; proportion and comparative measurements; exercises in sketching of technical objects. Plates upon completion are bound and properly titled. Required of students in engineering.

**Dr. 102. Mechanical Drawing.** One credit hour each term: one laboratory period. First and secnod terms.

Practice in plain lettering; use of instruments, projection and simple working drawings, the plates upon completion being enclosed in covers properly titled by the students. Required of students in mechanical engineering.

**Dr. 103. Mechanical Drawing.** Two credit hours: two laboratory periods. First term. One credit hour: one laboratory period. Second term.

A course similar to Dr. 102 for students in civil, electrical, rural, and chemical engineering.

**Dr. 104. Engineering Drawing.** One credit hour: one laboratory period. Second term.

Conventional signs used in mapping. Scale making, contours, hachures. Profiles and mapping. Required of students in civil, rural, and chemical engineering.

**Dr. 105. Descriptive Geometry.** Three credit hours: two lectures and one laboratory period. Third term. Prerequisite, Dr. 102 and Solid Geometry.

Detailing of machinery and drawing to scale from blue-prints. Tracing and blue-printing, and representation of flat and round surfaces by ink shading. Its relatioa to mechanical drawing and the solution of such problems relating to magnitudes in space as bear directly upon those which present themselves to engineers.

**Dr. 106. Descriptive Geometry.** Four credit hours: two lectures and two laboratory periods. First term.

A continuation of Dr. 105 for all engineers other than chemical.

**Dr. 107. Mechanical Drawing.** One credit hour: one laboratory period. First term.

Practice in plain lettering, use of instruments, geometrical constructions and plans of simple buildings. Elective for non-engineering students.

**Dr. 108. Drafting.** One credit hour: one laboratory period. Third term. Prerequisites, Dr. 102 and 103.

In this course problems pertinent to the work of students in each branch of engineering are selected. Drawings are made to scale. Empirical formulas for determining dimensions are used wherever possible.

**Dr. 109. Shades, Shadows, Perspective.** Two credit hours each term: two laboratory periods. First and second terms. Prerequisite, Dr. 106.

A practical course in the development and application of the theory of shadows and perspective of objects, and of shadows in perspective, supplemented by lectures. Must be taken with Dr. 110. Required of students in civil engineering.

### For Short-Course Students

**Dr. 1. Farm Drawing.** One laboratory period. First term.
A course similar to Dr. 107, for students in the two-year course in Agriculture.

**Dr. 2. Mechanical Drawing.** Two laboratory periods. First, second and third terms.

Instruction in commercial drafting. This is preceded by a study of drafting instruments and freehand lettering. Projection applied to shop drafting of machine parts. Tracing and blue-printing. The making of detail and assembly drawings. Free hand sketching of machine tools.

**Dr. 3. Freehand Drawing.** One laboratory period. Third term.
A course similar to Dr. 101.

## ELECTRICAL ENGINEERING

**E. E. 101. Elementary Electricity.** Two credit hours each term: two lectures. Second and third terms.

The elementary theories of electrical and magnetic phenomena are carefully developed, the course being correlated with the technical work taken up later. Required of students in electrical and rural engineering. Must be taken with El. Lab. 104.

**E. E. 102. Direct Current Theory.** Three credit hours each term: three lectures. First and second terms. Prerequisite, E. E. 101.

The study of the principles involved in the construction and operation of direct and alternating current generators and motors. Also the characteristic curves and efficiencies of the various types of machines, the selections of machines for specific duties and the proper methods of installing and operating. Required of students in electrical engineering. Must be taken with El. Lab. 104.

**E. E. 103. Dynamos and Alternating Currents.** Three credit hours: three lectures. Third term. Prerequisite, E. E. 102.

This is a continuation of E. E. 102, which covers the characteristics of direct current machinery. A number of analytical and graphical problems are required to give a clear conception of the effects of inductance and capacity in alternating current circuits. Required of students in electrical engineering. Must be taken with El. Lab. 104.

**E. E. 104. Alternating Currents and Alternating Current Machinery.** Three credit hours each term: three lectures. First, second and third terms. Prerequisite, E. E. 103.

The theory, construction and practical applications of single phase and polyphase alternating current machinery, including generators, synchronous, induction, and repulsion motors, converters, transformers, etc., are taken up in detail. Required of students in electrical engineering. Must be taken with El. Lab. 105.

**E. E. 105. Lighting and Illumination.** Three credit hours: three lectures. Third term.

A study of the various systems of distribution used in arc and incandescent lighting. Lectures on the manufacture and characteristics of the many forms of electric lamps; the selection of lamps for commercial work, and the principles of correct interior and exterior illumination. Required of students in electrical and rural engineering.

**E. E. 106. Electric Power Plants and Transmission.** Three credit hours: three lectures. Second term.

This course includes the principles governing the installation and operation of power-house and substation machinery and systems. A number of practical problems are given to illustrate the principles. Required of students in electrical engineering.

**E. E. 107. Telephones and Telegraphs.** Two credit hours: two lectures. Second term.

The application of electricity to telephones and telegraphs, with a study of the construction and operation of the apparatus required for the magneto, common battery and automatic exchanges. The principles of the operation of simple, duplex, quadruplex and simultaneous telegraps. Required of electrical and elective for rural engineering students. Must be taken with El. Lab. 106.

**E. E. 108. Wireless Telegraphy.** One credit hour: one lecture. Second term. Prerequisite, E. E. 102.

The principles of the application of electric waves to wireless telegraphy and telephony are followed by a study of the various systems in commercial use. Required of students in electrical engineering. Must be taken with El. Lab. 107.

**E. E. 109. Electric Railways.** Three credit hours: three lectures. Third term.

The could includes the consideration of the design and operation of the electric railway systems, power plants and sub-stations. Many problems are given which involve the enginering features of modern raiway development. Required of students in electrical engineering.

**E. E. 110. Primary and Secondary Batteries.** Two credit hours: two lectures. Second term.

A study of the various types of primary batteries and their application to commercial work. The theory, construction and application of

lead storage cells and Edison storage batteries. A short outline of the auxiliary apparatus used in connection with sorage sells. Required of studuents in electrical and rural engineering.

**E. E. 111. Dynamo Electric Machinery.** Two credit hours: two lectures. First term.

A general course in direct and alternating currents, covering the principles of construction and operation of machines used in commercial practice. Required of civil, mechanical and chemical engineering students. Must be taken with El. Lab. 102.

**E. E. 112. Dynamo Electric Machinery.** Two credit hours: two lectures. Second term. Prerequisite, E. E. 111.

A continuation of E. E. 111. Required of mechanical and chemical engineering students. Must be take with El. Lab. 103.

### For Short-Course Students

**E. E. 1. Elements of Direct Current Machinery.** Two lectures and one laboratory period. First and second terms.

The study of the fundamental principles involved in the construction and operation of direct current generators and motors. Characteristic curves and the selection of machines for specific purposes. Methods for installing and maintaining various types of geerators and motors. The laboratory practice includes the installation of generators and motors with the necessary auxiliary apparatus, and commercial tests of the various types of direct current machines.

**E. E. 2. Elements of Alternating Current Machinery.** Four lectures and one laboratory period. Third term. Prerequisite, E. E. 1.

This course includes the study of fundamental principles and the design and construction of alternating current machinery. The laboratory work consists of commercial tests of single phase and polyphase machinery, including generators, motors, converters, transformers, etc.

**E. E. 3. Illumination.** Two lectures and one laboratory period. Second term.

Lectures on the manufacture and characteristics of the various forms of arc and incandescent lamps; the selection of lamps and reflectors for commercial work; the principles of correct interior and exterior illumination. The laboratory work includes the determination of the operating characteristics, the measuring of the candle-power of lamps, and the measurement of the efficiency of actual lighting installations.

**E. E. 4. Electric Power Plants and Transmission.** Two lectures. Third term.

The principles governing the installation and operation of power-house and substation machiery, transmission and distribution systems.

**E. E. 5. Telephones and Telegraphs.** Three lectures and one laboratory period. Third term.

A study of the construction and operation of the apparatus required for magneto, common battery and automatic exchanges. The principles of the operation of simple, duplex and quadruplex telegraphy. The laboratory work includes experiments with the various types of apparatus and the operation of exchanges.

**E. E. 6. Primary and Secondary Batteries.** Two lectures and one laboratory period. First term.

The study and testing of various types of primary batteries and their application to commercial work. The theory and construction of lead storage cells and Edison storage batteries. Actual tetsing of batteries in operation.

**E. E. 7...Electrical Measuring Instruments.** Two lectures and one laboratory period. First term.

The theory governing the design, construction and application of all types of direct and alternating current instruments. The repairing, testing and calibration of the different types of instruments.

**E. E. 8. Electrical Equipment Repairs.** One lecture and one laboratory period. Second term.

This course includes the rewinding of armature and field coils, testing of commutators, repairs for signal systems, etc.

**E. E. 9. Interior Wiring.** Two lectures and two laboratory periods. First term. One lecture and one laboratory period. Second term.

A thorough study of the Underwriters' Rules concerning all classes of interior wiring. Calculations for circuits and the design of interior light and power systems. The practice includes the installation of residence and commercial light and power systems.

**E. E. 10. Outside Line Construction.** One lecture and one laboratory period. Third term.

The design and construction of short transmission and distribution systems.

## ELECTRICAL ENGINEERING DESIGN

**E. Des. 101. Direct Current Dsign.** Five credit hours: two lectures and three laboratory periods. Third term. Prerequisite, E. E. 102.

This course covers the design of direct current generators and motors, including the use of the different conducting, magnetic and insulating materials. Required of students in electrical engineering.

**E. Des. 102. Alternating Current Design.** One credit hour: one laboratory period. First term. Prerequisite, E. Des. 101.

The complete design of an alternating current generator or a transformer. Required of students in electrical engineering.

## ELECTRICAL ENGINEERING LABORATORY

**El. Lab. 101. Electrical Engineering Laboratory.** One credit hour each term: one laboratory period. Second and third terms.

A laboratory course designed to verify the laws and principles outlined in E. E. 101. Required of students in electrical and rural engineering. Must be taken with E. E. 101.

**El. Lab. 102. Electrical Engineering Laboratory.** One credit hour: one laboratory period. First term.

This course includes the methods of measuring resistance, current and electromotive force; photometry; and elementary testing of generators and motors. Required of civil, mechanical and chemical engineering students. Must be taken with E. E. 111.

**El. Lab. 103. Electrical Engineering Laboratory.** One credit hour: one laboratory period. Second term.

A continuation of El. Lab. 102. Required of students in mechanical and chemical engineering. Must be taken with E. E. 112.

**El. Lab. 104. Electrical Engineering Laboratory.** Two credit hours each term: two laboratory periods. First and third terms. One credit hour: one laboratory period. Second term.

Study and calibration of instruments. Measurements of resistance, current and electromotive force; commercial tests on generators and motors; arc lamp testing and photometry. Required of students in electrical engineering. Must be taken with E. E. 102 and 103.

**El. Lab. 105. Electrical Engineering Laboratory.** Two credit hours each term: two laboratory periods. First, second and third terms.

Measurement of inductance, impedance, condensance, etc.; power measurements in alternating current circuits; regulation and efficiency tests of alternators and transformers; operating characteristics of synchronous and induction motors. Required of students in electrical engineering. Must be taken with E. E. 104.

**El. Lab. 106. Telephone Laboratory.** One credit hour: one laboratory period. Second term.

This course covers experimental work with all types of telephone apparatus and the operation of the magneto and common battery exchanges. Required of students in electrical engineering and elective for students in rural engineering. Must be taken with E. E. 107.

**El. Lab. 107. Wireless Laboratory.** One credit hour: one laboratory period. Second term.

The course includes practice in sending and receiving signals in Continental Code, the design and construction of radio receiving sets, and the operation of long distance receiving apparatus. Required of students in electrical engineering. Must be taken with E. E. 108.

## EXPERIMENTAL LABORATORY.

**Exp. Lab. 101. Testing.** One credit hour: one laboratory period. Second term. Prerequisite, Mech. 103.

Study of testing machines and accessories. Operation of steam engine. Study of planimeter and indicator. Test of gas engines. Tension tests of wrought iron and steel. Transverse tests of cast iron and timber. Compression tests of long and short wood and concrete columns. Required of all engineering students, except chemical.

**Exj. Lab. 102. Efflperimental Engineering.** One credit hour: one laboratory period. Third term.

Determining the amount of moisture in steam; the efficiency of the injector; the transit and its uses; indicator practice; slide valve setting; the slide rule and micrometer; the analysis of boiler feed water; flue gases; lubricating oils; and the determination of the heating value of fuels and moisture in steam. Required of students in mechanical engineering.

**Exp. Lab. 103. Cement Testing.** One credit hour: one laboratory period. First term.

Standard tests of cement and concrete mortars. Time of setting. Tension and compression tests. Required of students in civil, mechanical and rural engineering.

**Exp. Lab. 104. Experimental Engineering.** One credit hour each term: one laboratory period. First and third terms. Two credit hours: two laboratory periods. Second term.

A continuation of Exp. Lab. 102. Required of students in mechanical engineering.

## HIGHWAY ENGINEERING

**Hwys. 101. Highways.** Two credit hours: two lectures. First term.

Principles of location, construction and maintenance of country roads and city streets and pavements. Required of civil and rural engineering students.

**Hwys. 102. Highway Engineering.** Three credit hours: two lectures and one laboratory period. Second term. Four credit hours: two lectures and two laboratory periods. Third term.

Advanced course in highway design, construction and maintenance. Field work in making the necessary surveys for the preparation of the plans, specifications and estimates of cost for the building of a short stretch of improved road. Study of highway construction machinery. Study of highway economics, administration and legislation. Elective for students in civil engineering.

**Hwys. 103. Materials Laboratory.** One credit hour: one laboratory period. Third term. Prerequisite, Chem. 102.

Tests of oils, asphalts, tars and road binders. Elective for students in civil engineering.

### For Short-Course Students

**Hwys. 1. Country Roads.** Two lectures and one laboratory period. Third term.

Elementary course in the location, construction and maintenance of country roads and bridges. Theory and field practice in location, establishing grades, drainage, computation of earthwork, methods of construction and road machinery. Study of the utilization of local road and bridge materials.

## HYDRAULIC AND SANITARY ENGINEERING

**Hyd. 101. Hydraulics.** Three credit hours: three lectures. Third term. Prerequisite, Mech. 102.

Principles of Hydraulics. Flow in open channels and pipes and through orifices. Methods of measurement, stream gauging, etc. Required of all students in engineering.

**Hyd. 102. Hydraulics.** One credit hour: one laboratory period. First term. Prerequisite, Hyd. 101.

Determination of the coefficient of discharge, velocity and contraction in pipes, orifices and weirs. Stream gauging methods. Flow measurements. Required of students in civil and rural engineering.

**Hyd. 103. Hydromechanics.** Three credit hours: three lectures. First term. Prerequisite, Hyd. 101.

Pumps, pumping machinery, water wheels and turbines. Friction losses in plants and water systems. Study of distribution systems. Required of students in civil, electrical, mechanical and chemical engineering. Elective for rural engineering students.

**Hyd. 104. Elements of Sanitary Engineering.** Three credit hours: three lectures. First term.

In this course the principles underlying water supply and sewerage are discussed and the general problems which present themselves to an engineer in practice are emphasized. Required of civil engineering and elective for rural engineering students.

**Hyd. 105. Water Supply.** Three credit hours: two lectures and one laboratory period. Second term.

This course deals with the principles of water supply engineering. It includes the methods of obtaining a good supply, its purification, and the design and operation of distribution systems and filtration plants. Elective for students in civil and mechanical engineering.

**Hyd. 106. Sewerage.** Four credit hours: two lectures and two laboratory periods. Third term.

This course takes up the principles involved in and the methods of sewage disposal and the design of sewerage systems and septic tanks. House connections and plumbing are also considered. Elective for students in civil engineering.

**Hyd. 107. Hydaaulic Design.** One credit hour: one laboratory period. Third term.

Design of a small sewerage system and disposal plant. Elective for students in civil and rural engineering. Must be taken with Hyd. 106.

**Hyd. 108. Drainage.** One credit hour: one lecture. Third term.

Study of the principles of underground flow. Drainage of farm lands. Planning systems. Elective for non-engineering students. Must be taken with Surv. 110.

**Hyd. 109. Drainage.** One credit hour: one laboratory period. Third term.

Field practice in study of drainage conditions. Planning the system from notes in field. Elective for non-engineering students. Must be taken with Hyd. 108.

**Hyd. 110. Advanced Drainage.** Two credit hours. one lecture and one laboratory period. Third term.

Elective for rural engineering and non-engineering students.

### For Short-Course Students

**Hyd. 1. Drainage.** Two lectures and two laboratory periods. First term.

Elementary course in farm drainage for students in two-year course in agriculture. Theory and field practice in farm drainage. Surveying, designing and constructing drainage systems for the improvement of agricultural lands.

**Hyd. 2. Drainage.** Three lectures and two laboratory periods. Third term.

Principles of underground flow and the relation of soils to drainage. Land drainage systems and methods. Field practice in the surveying of drainage areas, plotting of maps, designing systems, estimating costs and setting stakes for construction. Drainage laws and assessments.

**Hyd. 3. Water Supply.** Two lectures and one laboratory period. First term.

In this course consideration is given to applications of the principles of hydraulics, methods of purifying water, and design of small water supply systems and filtration plants.

**Hyd. 4. Sanitation.** Two lectures and one laboratory period. Second term.

This course has for its object the consideration of the principles involved in the design of small sewerage systems for individual houses of for small towns, supplemented by discussions relative to house drainage and plumbing. Methods for the disposal of sewage and garbage are also considered.

## MACHINE DESIGN

**M. Des. 101. Elementary Machine Design.** Two credit hours: one lecture and one laboratory period. First term. Prerequitite, Dr. 108.

Freehand sketching of the details of machinery and making working drawings of same. Calculations and drawings of a simple type punching press. Required of students in electrical, mechanical and rural engineering.

**M. Des. 102. Machine Design.** Three credit hours: two lectures and one laboratory period. Second term.

A continuation of M. Des. 101. Required of students in electrical and mechanical engineering.

**M. Des. 103. Machine Design.** Four credit hours: two lectures and two laboratory periods. Third term.

A continuation of M. Des. 102. Required of students in mechanical engineering.

**M. Des. 104. Kinematics of Machinery.** Three credit hours: two lectures and one laboratory period. Third term. Prerequisites, M. Des. 101.

Centrodes. Determination of the instantaneous axis and instantaneous center. Preparation of displacement, velocity and acceleration diagrams. Design of cams. Slow advance and quick return motion for machine tools. Form of tooth outlines in the epicycloidal and involute eystems. Reuired of students in mechanical engineering.

**M. Des. 105. Design of Farm Machinery.** Three credit hours each term: two lectures and one laboratory period. Second and third terms. Prerequisite M. Des. 101.

**For Short-Course Students**

The design and drafting of those portions of farm machinery common to engines, and to harvesting, pumping and fertilizing machinery, such as levers levers, shafts, gears and frames. Elective for students in rural engineering.

**M. Des. 1. Machine Drafting and Design.** Two laboratory periods each term. First, second and third terms.

The designing and detailing of a complete machine, including the determination of the stresses and the calculations for the various parts. Both empirical and rational methods are used.

## MATHEMATICS

**Math. 101. Trigonometry.** Five credit hours: five lectures. First term.

Plane and Spherical Trigonometry. Deduction of formulas and their application to the solution of triangles, trigonometric equations, etc. Required of students in engineering who have offered Soldid Geometry for entrance.

**Math. 102. Solid Geometry and Spherical Trigonometry.** Five credit hours: five lectures. First term.

In this course emphasis is placed on the relation of the subject to descriptive geometry and on areas and volumes of solids. The latter portion of the time is devoted to spherical trigonometry. Required of engineering students who have offered plane trigonometry for entrance. Elective for other students.

**Math. 103. Analytic Geometry.** Five credit hours each term: five lectures. Second and third terms. Prerequisites, Math. 101 and 102.

Geometry of two and three dimensions, loci of general equations of second degree, higher plane curves, etc. Required of students in engineering.

**Math. 104. Advanced Algebra.** Three credit hours: three lectures. First term.

Algebra beyond that required for admission. Elementary theory of equations, partial fractions, permutations, etc. Required of engineering students.

**Math. 105. Calculus.** Twe credit hours: two lectures. First term. Five credit hours each term: five lectures. Second and third terms. Prerequisite, Math. 103.

A discussion of the methods used in differentiation and integration and the application of these methods in determining maxima and minima, areas, volumes, moments of inertia, etc. Required of engineering students.

**Math. 106. Algebra.** Three credit hours: three lectures. First term.

Quadratic Equations, simultaneous quadratic equations, progressions, graphs, logarithms, etc. Required of students in chemistry.

**Math. 107. Plane Trigonometry.** Three credit hours: three lectures. Second term.

Trigonometric functions. Development of formulas and their application to the solution of trigonometric equations and of right and oblique triangles. Required o fstudents in chemistry.

**Math. 108. Plane Analytic Geometry.** Three credit hours: three lectures. Third term. Prerequisites, Math. 106 and 107.

A discussion of the straight line, conic sections and higher plane curves. Required of students in chemistry.

**Math. 109. Plane Analytic Geometry.** Three credit hours: three lectures. First term.

A continuation of Math. 108. Required of students in chemistry.

**Math. 110. Calculus.** Three credit hours each term: three lectures. Second and third terms. Prerequisite, Math. 109.

A general course in differential and integral calculus particularly adapted to the needs of students in chemistry.

**Math. 111. Solid Geometry.** Three credit hours: three lectures. Third term.

A course in geometry similar to Math. 102. Elective.

**Math. 112. Differential Equations.** Three credit hours: three lectures. Second term. Prerequisite, Math. 105.

The solution of the simpler differential equations is discussed. Elective for students in civil and mechanical engineering.

**Math. 113. Least Squares.** Two credit hours: two lectures. Third term.

A short course in which stress is laid on the application to geodesy. Elective.

**Math. 114. Estimates and Costs.** One credit hour: one laboratory period. First term.

Methods of estimating costs, supplemented by problems of a practical nature. Required of students in civil and rural engineering.

**Math. 115. Astronomy.** Three credit hours: three lectures. Second term.

A course in descriptive astronomy. Elective.

### For Short-Course Students

**Math. 1. Shop Mathematics.** One lecture. First, second and third terms.

Applications of arithmetic, algebra, geometry and trigonometry to the solution of practical shop problems.

**Math. 2. Algebra.** Three lectures. First and second terms.

Algebra from the beginning to quadratic equations.

**Math. 3. Plane Geometry.** Three lectures. Third term.

A thorough first course in plane geometry, using a standard text.

**Math. 4. Plane Geometry.** Three lectures. First term.

A continuation of Math. 3.

**Math. 5. Shop Mathematics.** One lecture. First and second terms.

A continuation of Math. 1.

**Math .6. Plane Trigonoemtry.** Three lectures. Second term.

Trigonometric functions. Development of formulas. Logarithms. Solution of triangles.

**Math. 7. Applied Mathematics.** Three lectures. Third term.

The application of mathematics previously taught to the solution of shop problems.

## MECHANICAL ENGINEERING

**M. E. 101. Technical Instruction.** One credit hour each term: one lecture. First and second terms.

Explanation of the reading of mechanical drawings; the proper cutting angles, care and adjustment of carpenter tools; relative strength of wood joints; wood, its shrinking and warping, and how to correct and prevent. Drill in problems in arithmetic, algebra and drawing supplemented by notes and lectures. Required of students in mechanical engineering.

**M. E. 102. Steam Engines, Boilers and Dynamos.** Three credit hours: three lectures. First term.

The principles of steam and the steam engine. The slide valve and valve diagrams. The indicator and its diagram. Steam boilers, the various types and their advantages. Each student taking this course is required to spend certain hours in the power plant actually operating

the engine, boilers and dynamos. Required of students in electrical and mechanical engineering. Elective for rural engineering students.

**M. E. 103. Technical Mechanics.** Two credit hours: two lectures. Second term.

Elementary principles of applied mechanics, calculation of gear and pulley trains, bent levers, calculation of belt lengths, lacing belts, the suction pump, and bolts and screws. Required of students in mechanical engineering.

**M. E. 104. Heat Engineering.** Two credit hours: two lectures. First term. Prerequisite, M. E. 102.

Laws underlying the fundamental equations. Perfect gases. Compound, hot-air and gasoline engines. Theory of vapors. Relation between pressure, volume, temperature, work and heat for special changes of state. Calculation and drawing of Carnot's cycle and temperature entropy diagram. The steam turbine. Compressed air and refrigeration machinery. Required of students in electrical and mechanical engineering.

**M. E. 105. Heat Engineering.** Three credit hours each term: three lectures. Second and third terms.

A continuation of M. E. 104. Required of mechanical engineering students.

**M. E. 106. Heating and Ventilation.** Three credit hours: two lectures and one laboratory period. Third term. Prerequisite, Dr. 108.

The principles of ventilating; amount of heat required for warming; radiating surfaces; steam, hot-water and hot-air systems; vacuum and vapor systems; pipe and pipe systems; appliances; specifications and contracts. Required of mechanical and rural and elective for civil engineering students.

**M. E. 107. Marine Engineering.** Two credit hours: two laboratory periods. Third term.

This is a preliminary course in marine engineering aranged for those desiring to specialize in marine engineering and deals with the theory of compound and triple expansion engines and the design of the principal parts of these types and of the marine boiler. Elective for students in mechanical engineering.

**M. E. 108. Steam Turbine Engineering.** Two credit hours: two laboratory periods. Third term.

This is a preliminary course arranged for those desiring to specialize in turbine engineering and deals with the theory of the various types of turbines and the design of the essential parts. Elective for students in mechanical engineering.

**M. E. 109. Gas Engines.** Four credit hours: three lectures and one laboratory period. Third term.

The fundamental principles concerning the gas engine. Its applications to agricultural operations. Elective for students in the four-year agricultural courses.

### For Short-Course Students

**M. E. 1. Gas Engines.** Two lectures and one laboratory period. Third term.

A course similar to M. E. 109, for students in the two-year course in agriculture. Elective.

**M. E. 2. Technical Instruction.** Two lectures. First, second and third terms.

Explanation of the reading of mechanical drawings; the proper angles for wood-cutting tools, care and adjustment of carpenter tools; relative strength of wood joints; wood, its shrinking and warping, and how to prevent and correct. Freehand sketching of tools and apparatus.

**M. E. 3. Heat Engines.** Four lectures. First term.

Elementary laws of steam and gases. Principles of the steam, gas and oil engine. The steam turbine. Compressed air and refrigeration machinery.

**M. E. 4. Technical Mechanics.** Four lectures. First, second and third terms.

Mechanics of materials with applications to strength of machine parts, power transmission, belting, gears, cams, rope and chain drives, boilers and pumps.

**M. E. 5. Power Plant Operation.** One laboratory period. First term.

The actual operation of boilers, engines, pumps and electric generators. This includes heating systems. The work will be done on Friday nights.

## MECHANICS AND MATERIALS OF CONSTRUCTION

**Mech. 101. Graphic Statics.** Three credit hours: two lectures and one laboratory period. Second term. Prerequisites, Phys. 101 and Dr. 102 or 103.

The theory and practice of the methods of determining stresses in cranes, roof trusses and bridges, and stresses on beams and girders due to traveling loads. Analysis of the stresses in roof trusses by the force polygon. Application of the equilibrium polygon to beams and girders. Analysis of stresses in bridge trusses. Required of all engineering students, except chemical.

**Mech. 102. Analytical Mechanics.** Three credit hours: two lectures and one laboratory period. Third term. Prerequisites, Phys. 101 and Math. 105.

A study of statics dealing with the composition and resolutions of forces, moments, couples, machines and laws of friction; and of dynamics, dealing with velocity, acceleration, laws of motion, work, energy and applications to problems. Required of engineering students.

**Mech. 103. Mechanics of Engineering.** Five credit hours: five lectures. First term. Prerequisite, Mech. 102.

The mechanics of solids. Statics of material point and of rigid bodies. Chains and cords. Centrifugal and centripetal forces. Work. Power. Energy. Sliding friction, friction of journals, friction of pivots, friction of ropes and belts. Analysis of stresses in thick cylinders. Required of all students in engineering, except chemical.

**Mech. 104. Mechanics of Engineering.** Two credit hours each term: two lectures. Second and third terms.

A continuation of Mech. 103. Required of students in civil and mechanical engineering.

**Mech. 105. Materials of Construction.** Two credit hours: two lectures. Second term. Prerequisite, Mech. 103.

A study of the manufacture, composition and properties of the various materials used in engineering. Required of students in civil and mechanical engineering.

### For Short-Course Students

**Mech. 1. Concrete.** Two lectures and one laboratory period. First term.

Consideration is given in this course to the materials used in making concrete, the properties of concrete, both plain and reinforced, and its use in the construction of simple structures. The practical work includes the mixing and placing of concrete and the application of formulas to the design of beams, girders, etc.

## PHYSICS

**Phys. 101. Mechanics and Sound.** Four credit hours: four lectures. First term. Prerequisite, Math. 101.

Lectures, recitations and domonstrations on mechanics and sound. Required of students in engineering and chemistry. Must be taken with Phys. Lab. 101.

**Phys. 102. Electricity and Magnetism.** Four credit hours: four lectures. Second term.

The elementary theory of electricity and magnetism and the practical application of the various laws. Required of students in engineering and chemistry. Must be taken with Phys. 102.

**Phys. 103. Heat and Light.** Four credit hours: four lectures. Third term.

Nature of heat, expansion, change of state, transmission and radiation of heat, and the elements of thermodynamics. Theory of light, reflection, refraction, dispersion, etc.; use of prisms, lenses and mirrors. Required of students in engineering and chemistry. Must be taken with Phys. Lab. 103.

**Phys. 104. General Physics.** Two credit hours each term: two lectures. First, second and third terms.

A discussion of such branches of physics as are suited to the needs of students in the non-technical courses. Elective. Must be taken with Phys. Lab. 104.

### For Short-Course Students

**Phys. 1. Elementary Physics.** Three lectures. First, second and third terms.

An elementary course including lectures and recitations in mechanics, heat, light, electricity and magnetism. Special attention is paid to practical applications.

## PHYSICAL LABORATORY

**Phys. Lab. 101. Mechanics and Sound.** One credit hour: one laboratory period. First term.

Quantitative experiments illustrating the laws and principles studied under Phys. 101. Required of students in engineering and chemistry. Must be taken with Phys. 101.

**Phys. Lab. 102. Electricity and Magnetism.** One credit hour: one laboratory period. Second term.

The study of magnetic fields and the measurement of current, electromotive force, resistance, etc. Required of students in engineering and chemistry. Must be taken with Phys. 102.

**Phys. Lab. 103. Heat and Light.** One credit hour: one laboratory period. Third term.

Quantitative experiments in heat and light. Required of students in engineering and chemistry. Must be taken with Phys. 103.

**Phys. Lab. 104. General Physics.** One credit hour each term: one laboratory period. First, second and third terms.

Experiments illustrating the subjects discussed in Phys. 104. Elective for students in the non-technical courses. Must be taken with Phys. 104.

### For Short-Course Students

**Phys. Lab. 1. Elementary Physics.** One laboratory period. First, second and third terms.

An elementary course including experiments selected to illustrate the principles discussed under Phys. 1. Must be taken with Phys. 1.

## RAILWAY ENGINEERING

**Rwys. 101. Railway Curves.** Three credit hours: two lectures and one laboratory period. Second term. Prerequisite, Surv. 105.

Simple and compound curves, frogs, turnouts and crossings. Spirals. Required of students in civil engineering.

**Rwys. 102. Railway Earthwork.** Two credit hours: two lectures. Third term. Prerequisite, Rwys. 101.

Cross-sectioning. Earthwork computations. Haul. Overhaul. Mass diagrams. Required of students in civil engineering.

**Rwys. 103. Railway Surveying.** Two credit hours: two laboratory periods. Third term. Prerequisite, Rwys. 101.

Preliminary surveys, location surveys, taking of cross-sections. Computation of quantities. Estimates. Must be taken with Rwys. 102. Required of students in civil engineering.

**Rwys. 104. Railway Economics.** Three credit hours: three lectures. Second term. Prerequisite, Rwys. 101.

Ballasting, track fastenings, rails, buildings and structures, terminals, signaling, rolling stock. Promotion, operating expenses, effects of curvature nad grade. Valuation, repairs and renewals. Elective for students in civil engineering.

## SHOP PRACTICE

**Shop 101. Woodwork.** One credit hour each term: one laboratory period. First and third terms. Two credit hours: two laboratory periods. Second term.

During the first term is taught the use and care of bench tools, exercise in sawing, mortising, tenoning and laying out work from blueprints. The second term is devoted to projects involving construction, decoration and wood-turning. During the third term the principles and processes of pattern-making are taught, together with enough foundry work to demonstrate the uses of pattern-making. Required of students in mechanical engineering.

**Shop 102. Woodwork.** One credit hour each term: one laboratory period. First and second terms.

A course similar to the first and second terms of Shop 101 for students in electrical engineering.

**Shop 103. Woodwork.** One credit hour: one laboratory perid. First term.

A short course similar to the first term of Shop 101 for students in civil and rural engineering.

**Shop 104. Woodwork.** One credit hour: one laboratory period. Second term.

A course for students in agricultural courses, in which emphasis is laid on the types of woodwork used on the farm. Elective.

**Shop 105. Blacksmithing.** Two credit hours: two laboratory periods. Second term. Prerequisite, Shop 101.

The making of the fire and how to keep it in order. The operations of drawing out, upsetting and bending of iron and steel, including the calculations of stock for bent shapes. Welding. Construction of steel tools for use in the machine shop, including tool dressing and tempering. Annealing.

**Shop 106. Blacksmithing.** One credit hour: one laboratory period. Second term.

A course similar to Shop 105, for students in electrical and rural engineering.

**Shop 107. Forging and Pipefitting.** One credit hour: one laboratory period. Third term.

A course fitted to meet the needs of students in the four-year courses in agriculture. Elective.

**Shop 108. Foundry Work.** Two credit hours: two laboratory periods. Third term. Prerequisite, Shop 105.

Molding in iron and brass. Coremaking. The cupola and its management. Lectures on the selection of irons by fracture, fuels, melting and mixing of metals. Required of students in mechanical engineering.

**Shop 109. Machine Work.** One credit hour: one laboratory period. Third term.

Elementary principles of vise and machine work, which include turning, planing, drilling, screw-cutting and filing. This is preceded by study of the different machines used in machine shops. Required of students in mechanical engineering.

**Shop 110. Machine Shop.** Three credit hours: three laboratory periods.

A continuation of Shop 109. Required of students in mechanical engineering.

**Shop 111. Machine Work.** One credit our each term: one laboratory period. First and second terms.

A course suited to the needs of students in electrical and rural engineering.

## For Short-Course Students

**Shop 1. Farm Woodwork.** One laboratory period. Second term.

Use of tools in constructing trestles, gates and frames. Required of students in the two-year course in agriculture.

**Shop 2. Forging and Pipefitting.** One laboratory period. Third term.

Similar to Shop 107, for students in the two-year course in agriculture.

**Shop 3. Carpentry and Pattern-Making.** Two laboratory periods. First term.

Joinery. Pattern and core-box construction. Wood turning.

**Shop 4. Advanced Woodwork.** One laboratory period. Third term.

In this course the special needs of the student are considered in laying out the work.

**Shop 5. Blacksmithing.** Two laboratory periods. Second term.

The making of the fire and how to keep it in order. The operations of drawing out, upsetting and bending iron and steel, including the calculations of stock for bent shapes. Welding. Making, tempering and annealing of steel tools.

**Shop 6. Foundry.** Two laboratory periods. Third term.

Molding in iron and brass. Core-making. The cupola and its management. Lectures on the selection of irons by fracture, fuels, melting and mixing of metals.

**Shop 7. Machine Work.** Two laboratory periods. First term.

Elementary principles of vise and machine work, which includes chipping, filing, turning, planing, drilling, screw-cutting and polishing. The study of the different machines precedes the operations.

**Shop 8. Advanced Machine Work.** Two laboratory periods. Second term.

Milling, gear-cutting, toolmaking, including taps, dies and reamers. Plain and differential indexing. Pipe-cutting and fitting.

**Shop 9. Shop work.** Three laboratory periods. Third term.

Students will be permitted to specialize in any of the shop courses. The work is of an advanced nature.

**Shop 10. Machine Work.** One laboratory perid. Third term.

A course similar to Shop 7, for students in electricity.

## STRUCTURAL DESIGN

**Str. Des. 101. Elementary Structural Design.** Three credit hours each term: two lectures and one laboratory period. Second and third terms. Prerequisite, Mech. 103.

This course includes the complete design and detailing of a steel roof truss and a plate girder; the detailing from standard commercial drawing sheets of floor beams, girders and columns, and the complete design of a bridge truss of either the Waren or Pratt type. The stresses are determined by analytical and graphical methods. Required of students in civil and rural engineering.

**Str. Des. 102. Structural Design.** Three credit hours each term: two lectures and one laboratory period. First, second and third terms. Prerequisite, Str. Des. 101.

Analysis of stresses in structural steel buildings. Design of roof trusses. Design of truss bridges and highway bridges. Design of plate girders under dead and live loads. Design of riveted connections. Both analytical and graphical methods are used. Required of students in civil engineering.

**Str. Des. 103.** Structural Design. Four credit hours each term. two lectures and two laboratory periods. First and third terms. Three credit hours: two lectures and one laboratory period. Second term. Prerequisite, M. Des. 102.

Analysis of stresses in traveling cranes and derricks. Design of crane girders and lattice girders. Design of cranes. Both analytical and graphical methods are used. Design of riveted connections. Required of students in mechanical engineering.

**Str. Des. 104. Masonry and Concrete.** Five credit hours: four lectures and one laboratory period. Second term.

A study of the materials used in masonry construction, the design and construction of foundations and retaining walls, and the elementary theory of reinforced concrete construction with its application in the design of beams, slabs, girders and columns. Required of students in civil engineering.

**Str. Des. 105. Design of Farm Structures.** Three credit hours each term: two lectures and one laboratory period. Second and third terms. Prerequisite, Str. Des. 101.

The design and arrangement of farm buildings and equipment. Lectures also cover the heating, lighting, ventilation and plumbing, together with their cost. Elective for students in rural engineering.

**Str. Des. 106. School Architecture.** Four credit hours: three lectures and one laboratory period. Third term. Prerequisite, Str. Des. 101.

The planning and detailing of moderate-priced and medium-sized school buildings, including the heating, ventilation, lighting and plumbing. Elective for students in rural engineering.

**Str. Des. 107. Farm Buildings.** Two credit hours: one lecture and one laboratory period. First term. Prerequisite, Dr. 107.

Design and specifications of a simple typical building in timber or concrete and lectures upon the details. The course is very practical and latitude is permitted the student to develop his ideas. Elective for non-engineering students.

### For Short-Course Students

**Str. Des. 1. Farm Buildings.** One lecture and one laboratory period. First term. Prerequisite, Dr. 1.

An elementary course similar to Str. Des. 107. Required of students in the two-year course in agriculture and in engineering (surveying option).

**Str. Des. 2. Concrete Structures.** One lecture and one laboratory period. Second term. Prerequisite, Str. Des. 1.

Design of simple concrete houses, bridges and culverts. Estimate of bills of material and cost. Required of students in the two-year course in engineering (surveying option).

## SURVEYING

**Surv. 101. Surveying.** Two credit hours: two lectures. Second term. Prerequisite, Math. 101.

Elements of surveying. Measurement of horizontal and level lines. Errors, use of compass, transit and level. Required of students in civil, electrical, rural and chemical engineering.

**Surv. 102. Surveying.** One credit hour: one laboratory period. Third term. Prerequisite, Surv. 101.

Application of the principles of elementary surveying to practical operations in the field. Measurement of lines, angles, elevations. Introductory use of the transit and level. Required of students in civil, electrical, rural and chemical engineering.

**Surv. 103. Surveying.** Two credit hours: two lectures. First term. Prerequisite, Surv. 102.

Theory of adjustment of instruments. Determination of direction. Measurement of angles. Land survey methods and computations. Required of students in civil and rural engineering. Must be taken with Surv. 104.

**Surv. 104. Surveying.** One credit hour: one laboratory period. First term.

Transit lines, level lines, traversing, mapping, computation of areas. Required of students in civil and rural engineering. Must be taken with Surv. 103.

**Surv. 105. Advanced Surveying.** Four credit hours: three lectures and one laboratory period. Second term. Prerequisite, Surv. 103.

Theory of stadia. General surveying methods. Topographic surveying. Plane table. Earthwork computations. City surveying. Hydrographic surveying. Theory of sextant. Field practice when weather permits. Required of students in civil engineering.

**Surv. 106. Advanced Surveying.** One credit hour: one laboratory period. Third term. Prerequisite, Surv. 105.

Field work in adjustment of instruments. Use of plane table. Topographic mapping. Use of sextant. Solar observations. Required of students in civil engineering.

**Surv. 107. Topographic Surveying.** One credit hour: one laboratory period. First term. Prerequisite, Surv. 106.

Field work in topographic methods. Base-line measurements. Elements of triangulation and adjustment of quadrilaterals. Required of students in civil engineering.

**Surv. 108. Geodesy.** Two credit hours: two lectures. Third term. Prerequisite, Surv. 105.

Applications of the method of least squares to precise surveying, leveling, and triangulation. Astronomical observations for azimuth, latitude, longitude and time. Elective for students in civil engineering.

**Surv. 109. Geodesy.** One credit hour: one laboratory period. Third term.

Practice in problems developed in Surv. 108. Elective for students in civil engineering.

**Surv. 110. Elementary Surveying.** One credit hour: one lecture. Third term. Prerequisite, Math. 107.

Measurement of lines, angles and elevations. Elementary use of transit and level. Elective for non-engineering students. Must be taken with Hyd. 108.

**Surv. 111. Elementary Surveying.** One credit hour: one laboratory period. Third term.

Application of principles of plane surveying to practical operations in the field. Profiles and traverses, computations of areas. Elective for non-engineering students. Must be taken with Surv. 110.

### For Short-Course Students

**Surv. 1. Elementary Surveying.** Three lectures and two laboratory periods. First term.

Theory and practice of elementary surveying. Use and care of chain, tape, compass, transit and level. Determination of direction and of elevation. Keeping of field notes. Land survey methods, computations and mapping.

**Surv. 2. Elementary Surveying.** Two lectures and one laboratory period. Second term.

Continuation of Surv. 1.

## FACILITIES FOR INSTRUCTION

The Engineering Building is well equipped with lecture-rooms, recitation-rooms, drafting-rooms, laboratories and shops for engineering work. The departments of Mathematics and Physics are located in the Engineering Building.

**Drafting-rooms.** The three drafting-rooms are well equipped for practical work. Two of these are used by the junior and senior classes, each student being provided with a separate desk. The third room is used jointly by the freshman and sophomore students and contains 15 drawing tables, accommodating about 90 students.

Engineering students must provide themselves with approved drawing outfit, materials and book, cost of which during the freshman year amounts to about $25.

The combined blue-print and dark room ,with its commodious printing frames, affords splendid opportunities for sun-printing, which is so useful to engineering students.

**Electrical Engineering Laboratory.** This laboratory is fitted with such appliances as may be used to the best advantage in engineering practice. These include a potentiometer and standard voltmeter and ammeter for calibrating the various measuring instruments used in the laboratory. A Sharp-Miller portable photometer and a standard photometer for measuring the candle-power of lamps and for determination of illumination intensities. A large number of portable ammeters, voltmeters and indicating wattmeters for direct and alternating current measurements, standard curve drawing voltmeter and ammeter, electrostatic voltmeter, frequency meters, silver and copper voltameters, Siemen's type electrodynamometer, watthourmeters and an oscillograph. A standard portable testing set, heating devices, condensers, tachometers, multiple circuit ammeter and voltmeter switches. D'Arsonval galvanometers, standard resistance boxes and bridges. The lamps used for experimental purposes include direct and alternating current multiple carbon arc, metallic arc, mercury vapor and nernst lamps.

A Curtis steam turbine, direct connected to a 35-kilowatt compound generator, has been installed for testing purposes. This may be used in connection with the University lighting plant when needed and will be used for light and power service in the Engineering Building.

The laboratory is so wired that connection may be made readily between any part of the University lighting plant and the turbo-generator or any of the apparatus in the dyamo-room.

The apparatus in the dynamo-room includes the following: A 10-kilowatt rotary converter of the latest type, with speed limit and end play devices; a five-horse-power variable speed, commutating pole motor; a 7.5-kilowatt, 60-cycle, 220-volt alternator designed to operate either as a polyphase generator, synchronous motor, frequency changer, constant speed induction motor or variable speed induction motor. The following parts are supplied with the set to make possible its operation in any of the above-named ways: a stationary armature for use either as an alternating current generator or as an induction motor field; a revolving field, a squirrel cage induction motor rotor with starting compensator having self-contained switches; an induction motor rotor with 3-phase collector rings, external resistance and controller; a 2-kilowatt booster set; a five-horse-power compound direct current motor and a 1.5-horse-power shunt motor fully inclosed; a 7.5-kilowatt, 120-volt, 3-phase self-excited generator direct connected to a 115-volt compound direct current motor; a motor-generator set consisting of a 3.6-horse-power shunt motor direct connected to a 2-kilowatt generator; several small D. C. and A. C. motors and generators; two 2-kilowatt transformers to transform power from 110 or 220 volts to 1100 or 2200 volts; various types of starting rheostats with automatic overload and no voltage release; field rheostats.

The main switchboards are used to mount the necessary circuit apparatus to control the generators and motors as well as the various circuits in the dynamo-room and testing laboratory. Wire and water rheostats are arranged for load and regulation. Portable lampboards and portable switchboards have been constructed for use in machine tests. In addition to the special electrical engineering equipment, the College lighting plant will be used for illustrative and experimental purposes. This plant contains, together with other apparatus useful in teaching electrical engineering, two Bullock generators of 40 kilowatts total capacity.

An eight-inch Waltham bench lathe, with all the necessary attachments, has been installed in the dyamo-room for the use of students in making small articles, such as binding posts, connecters, etc., for use in the laboratories.

The telephone laboratory is well equipped with apparatus for the magneto and common battery systems.

**Mechanical Engineering Laboratory.** Among the apparatus installed in the laboratory are a cross compound condensing Corliss engine of 50-

horse-power, equipped with brake, indicators, relief valves, reducing motion, steam and vacuum gauges and speed indicator, which gives ample opportunity for steam consumption and brake tests. This is connected with the shops, so that at any time it may be switched on and drive them. The University power plant, with its vacuum heating system, three 100-horse-power return tubular boilers and two electric generating units, offers opportunities for experimental work. An eight-horse-power, four-cycle gasoline engine equipped with prony brake permits the making of tests in gas engineering.

**Materials Laboratory.** In this laboratory the apparatus for testing materials includes a 100,000-pound Riehle combined hand and power-testing machine for making tensile, compression, shearing and transverse tests on various kinds of materials; a 1,000-pound Riehle machine for testing cement briquettes, etc. The testing of asphalts, tars, etc., used in roadwork is carried on under the direction of the Department of Chemistry.

**Hydraulic Laboratory.** Apparatus suitable for the determination of the coefficient of discharge for small orifices, weirs, etc., has been installed in this laboratory. Opportunity for experimental work in stream gauging, etc., is afforded by the streams in the vicinity.

**Physics Laboratory.** This laboratory is well supplied with apparatus for lecture-room demonstrations and for experiments undertaken by students. New pieces of apparatus are added to the equipment each year.

**The Shops.** The shops are well lighted and admirably adapted to the purpose for which they were designed. The wood-working shop contains accommodations for bench work and wood turning. The power machinery in this shop is a band and universal circular saw, one 16-inch by 10-foot pattern-maker's lathe, three grindstones, a wood trimmer, 26-inch wood planer, 14-inch joiner and universal tool grinder.

In the forge shops are sixteen power forges, one hand forge, a power emery grinder, and a pressure fan and exhauster for keeping the shop free of smoke. There is a full assortment of smith's tools for each forge.

The foundry is equipped with an iron supola, which melts 1,200 pounds or iron per hour, a brass furnace, one core oven and the necessary flasks and tools.

The machine shop equipment consists of one 10-inch speed lathe, one 22-inch engine lathe with compound rest, one 12-inch combined foot and power lathe, two 14-inch engine lathes, one 25-inch drill press, one No. 4 emery tool grinder, one No. 1½ universal milling machine and an assortment of vises, taps, dies, pipe-tools and measuring instruments.

The machinery of the pattern and machine shops is driven by a 9 by 14-inch automatic cut-off, high-speed engine, built by members of the

junior and senior mechanical engineering classes, after the standard design of the Atlas engine. An 8 by 12-inch engine drives the machinery of the blacksmith shop and foundry.

**Surveying Equipment and Models.** This equipment includes a number of transits, levels, compasses, plane tables and minor instruments for use in plane, topographic, railroad, highway and geodetic surveying. These are added to as the necessity for other equipment arises. The models include various types of roads, bridges, culverts, etc.

**Library.** Each department contains a well selected library of books for reference and the standard engineering magazines. Students are encouraged to take advantage of the opportunity for reading afforded in the departmental as well as in the general library.

## TWO-YEAR COURSE IN MECHANIC ARTS

The object of the course is to prepare men for positions of responsibility in lines of work in which training in mechanic arts and elementary engineering is necessary. There is a special need for such men at all times and particularly during the reconstruction period. The course affords an excellent opportunity for training to such persons as find it impossible for any reason to enter ony of the four-year courses in engineering. A certificate is granted to each student who satisfactorily completes the course. The first year of the course is devoted to the laying of a moundation in mathematics, physics and English, as well as in drawing and shop work. In the second year most of the time is devoted to subjects closely related to mechanical, electrical and civil engineering, the student selecting the branch in which he thinks he may use his tlents to the greatest advantage.

Throughout the course emphasis is laid on the necessity for turning out work in the drafting-room, shop and field which will meet the requirements of the commercial work. The student is taught that a task worth doing at all is worth doing well and that the finished product from the hand, brains, or both, must not only pass inspection, but be better than the average if one wishes to succeed. Parallel with the practical work instruction is given in the fundamentals upon which parctice is based. Thus the head and hand are brought into that intimate and harmonious relation so necessary to the normal development of the individual engaged in any industrial pursuit.

Among the positions which the course equips a man to fill may be noted the following: Tracers, draftsmen, rodmen, inspectors, chainmen, linemen, station operators, assistats in various branches related to engineering, salesmen for different kinds of machinery, and assistant foremen.

To enter the course a student must have completed at least the equivalent of the seventh grade in the Maryland public schools and be not less than 16 years of age.

The tabulated curriculum of the course follows. It gives the outline of the work in its different aspects:

**TWO-YEAR MECHANIC ARTS.**

| FIRST YEAR. Term: | I | II | III |
|---|---|---|---|
| Shop Mathematics (Math. 1) | 1 | 1 | 1 |
| Algebra (Math. 2) | 3 | 3 | ..... |
| Plane Geometry (Math. 3) | ..... | ..... | 3 |
| Elementary Physics (Phys. 1) | 3(3) | 3(3) | 3(3) |
| Composition (Eng. 4) | 3 | 3 | 3 |
| Technical Instruction (M. E. 2) | 2 | 2 | 2 |
| Mechanical Drawing (Dr. 2) | (6) | (6) | (6)* |
| Freehand Drawing (Dr. 3) | ..... | ..... | (3) |
| Carpentry (Shop 3) | (6) | ..... | ..... |
| Advanced Woodwork (Shop 4) | ..... | ..... | (3) |
| Blacksmithing (Shop 5) | ..... | (6) | ..... |
| Foundry (Shop 6) | ..... | ..... | (6)* |
| R. O. T. C. (M. I. 101) | 1(2) | 1(2) | 1(2) |
| **SECOND YEAR.** | | | |
| Plane Geometry (Math. 4) | 3 | ..... | ..... |
| Shop Mathematics (Math. 5) | 1 | 1 | ..... |
| Plane Trigonometry (Math. 6) | ..... | 3 | ..... |
| Applied Mathematics (Math. 7) | ..... | ..... | 3 |
| Business Law (————) | ..... | 3 | ..... |
| R. O. T. C. (M. I. 102) | 1(2) | 1(2) | 1(2) |
| **OPTION IN MECHANICS.** | | | |
| Heat Engines (M. E. 3) | 4 | ..... | ..... |
| Technical Mechanics (M. E. 4) | 2 | 2 | 4 |
| Direct Current (E. E. 1) | 2(3) | 2(3) | ..... |
| Alternating Currents (E. E. 2) | ..... | ..... | 4(3) |
| Machine Work (Shop 7 and 8) | (6) | (6) | ..... |
| Shop Work (Shop 9) | ..... | ..... | (9) |
| Machine Drafting (M. Des. 1) | (6) | (6) | (6) |
| Power Plant Operation (M. E. 5) | ..... | (3) | ..... |
| **OPTION IN ELECTRICITY.** | | | |
| Direct Current (E. E. 1) | 2(3) | 2(3) | ..... |
| Alternating Currents (E. E. 2) | ..... | ..... | 4(3) |
| Illumination (E. E. 3) | ..... | 2(3) | ..... |
| Power Plants (E. E. 4) | ..... | ..... | 2 |
| Telephones and Telegraphs (E. E. 5) | ..... | ..... | 3(3) |
| Batteries (E. E. 6) | 2(3) | ..... | ..... |
| Measuring Instruments (E. E. 7) | 2(3) | ..... | ..... |
| Equipment Repairs (E. E. 8) | ..... | 1(3) | ..... |
| Interior Wiring (E. E. 9) | 2(6) | 1(3) | ..... |
| Outside Lines (E. E. 10) | ..... | ..... | 1(3) |
| Machine Work (Shop 10) | ..... | ..... | (3) |
| **OPTION IN SURVEYING.** | | | |
| Elementary Surveying (Surv. 1 and 2) | 3(6) | 2(3) | ..... |
| Country Roads (Hwys. 1) | ..... | ..... | 2(3) |
| Drainage (Hyd. 2) | ..... | ..... | 3(6) |
| Water Supply (Hyd. 3) | 2(3) | ..... | ..... |
| Sanitation (Hyd. 4) | ..... | 2(3) | ..... |
| Concrete (Mech. 1) | 2(3) | ..... | 2(3) |
| Farm Buildings (Str. Des. 1) | 1(3) | ..... | ..... |
| Concrete Structures (Str. Des. 2) | ..... | 1(3) | ..... |
| Farm Equipment (————) | ..... | 1(3) | ..... |
| Farm Forestry (For. 1) | ..... | ..... | 2(3) |

*Students electing option in mechanics take foundry; others take mechanical drawing.

# THE SCHOOL OF LIBERAL ARTS

The School of Liberal Arts has as its prime object the offering of foundational and specialized instruction in language and literature and in social science. It aims to provide a stock upon which to graft technical and scientific education; to prepare the foundation for business, law, journalism, administration, philanthropic work, the more responsible civil service positions and the higher teaching positions; and to afford the opportunity for general cultivation and refinement of the mind.

## Departments

For administrative purposes the School of Liberal Arts includes the following departments: Ancient Languages and Philosophy, Economics, English Language and Literature, History and Political Science, Journalism, Modern Languages, Public Speaking, Library Science and Music. These departments, however, do not represent the scope of liberal arts instruction provided by the University. Additional curricula in bacteriology, botany, chemistry, drawing, entomology, geology, mathematics, pedagogy, physics, psychology and zoology are offered in the Schools where such subjects have a basic application. Between the School of Liberal Arts and the other schools there exists a close cooperation.

## Courses and Degree

Curricula in the School of Liberal Arts are organized according to the group elective system. This arrangement undertakes to fit the course to the student, rather than the student to the course, and particularly enables the School to embody in its curricula the following fundamental principles: First: such breadth of training as is characteristic of the well-educated man; second, a freedom of election that will motivate study and develop individuality and special aptitude; and, finally, the desirability of a student's deciding on a major interest so that there will be neither aimless nor dissipated effort.

By the group elective system a part of every student's curriculum is prescribed. Such prescription, however, includes only what is basic and fundamental. The remainder of the student's work is elective.

## Bachelor of Arts Degree

On satisfactory completion of two hundred and four trimester hours of college work, a student will be recommended for the degree of Bachelor of Arts. Credits towards this degree are subject to the following regulations:

## Regulations

**Subject-Matter Groups.** First of all, the student's curriculum is governed by four distinct subject-matter groups. These are:

A. Language and Literature: English, French, German, Greek, Journalism, Latin, Public Speaking, Spanish and Library Science.

B. Social Science: Economics, History, Philosophy,, Political Science and Sociology.

C. Natural Science: Bacteriology, Botany, Chemistry, Entomology, Geology, Physics, Physiology and Zoology.

D. Mathematics and Psychology: Mathematics, Psychology and Drawing.

The administration of Groups A and B lies wholly within the School of Liberal Arts; of Grops C and D, in other Schools of the University, with all of which the Art School cooperates.

**Courses Open to Freshmen.** The only courses open to freshmen are the following:

English 101-103, nine credit hours.

French 101-103, nine credit hours; 104-106 (for students who enter with two units in French), nine credit hours; 108-110 or 111-113 (for students who enter with three or more units in Frech), nne credit hours.

German 121-123, nine credit hours; 124-126 (for students who enter with two units in German), nine credit hours; 128-130 or 131-133 (for students who enter with three or more units in German), nine credit hours.

Latin 111-113 (for students who enter with two units in Latin), twelve credit hours; 118 (for students who enter with three or more units in Latin), four credit hours.

Library Science 101, one credit hour, first term.

Public Speaking 101-103, three credit hours; 107-109, three credit hours; 113-115, six credit hours.

Spanish 141-143, nine credit hours; 144-146 (for students who enter with two units in Spanish), nine credit hours.

History 101, three credit hours; 102-103, six credit hours.

Zoology, 101-102, eight credit hours.

Botany 101, four credit hours.

Chemistry 101-103, twelve credit hours.

Mathematics, nine credit hours.

Educational Guidance, three credit hours.

**Course Combination for Freshmen:** In order to guarantee to students during their first year a sound balance of content and to prevent unwise deviation from the fundamental principles of standard arts education, there has been arranged for all freshmen in this school the following combination of courses:

Composition and Rhetoric (Eng. 101-103), nine credit hours.
Reading and Speaking (P. S. 101-103), three credit hours.
A Foreign Language, nine credit hours.
A Laboratory Science, twelve credit hours.
History or Political Science, six credit hours.
Mathematics or a Freshman elective'* nine credit hours.
Library Methods (L. S. 101), one credit hour.

**Group Prescription**

A. Language and Literature: English 101-103, Public Speaking 101-103 and Library Science 101 are required of all students during their freshman year.

The student's combined work in high school and university must include at least two foreign languages. When the student enters with six units in foreign languages, he will be required to secure nine hours of credit in college; when the student enters with four units in foreign languages, he will be required to secure eighteen credits in the University; when the student enters with two units in foreign languages, he will be required to secure twenty-seven credits in the University; when the student enters with one unit in foreign languages, he will be required to secure thirty credits in the University; when the student enters with no units in foreign languages, he will be required to secure thirty-six credits in the University. Less than one unit in a foreign language will not be recognized.

B. Social Science: Every student must secure credit in the social science group for not less than eighteen trimester hours. At least nine of these credits must be in history. If, however, the student offers one or more high school units in history, then only nine trimester hours of credit in this group are prescribed.

C. Natural Science: Every student must secure credit for not less than nine trimester hours in either bacteriology, botany, physiology or zoology. If, however, the student offers one high school unit in any one of these four biological sciences, then no additional college credit is required. Every student must also secure credit for at least nine trimester hours in either chemistry, geology or physics. Students entering with neither chemistry nor physics must take a one-year's course in one of the two.

D. Mathematics and Psychology: Every student must secure credit either in high school or university for algebra through quadratics and for plane geometry. He must in addition secure credit in the University for at least nine trimester hours in mathematics.

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*If requirements in mathematics have been satisfied prior to entering the University or before the end of the freshman year, this time may be devoted to other freshman subjects.

**Majors and Minors.** All students registered in the School of Liberal Arts must secure at least sixty-three trimester hours of credit in either Group A or Group B, and at least twenty-seven trimester hours, or their equivalent, in some one subject of the group selected. All students of this School must also secure twenty-seven hours of credit in one of Groups A. C and D or B. C and D (according to the group in which the major is chosen), and at least eighteen trimester hours, or their equivalent, in some one subject of the group selected. The student is not permitted to secure more than one hundred and two trimester hours of credit in any one group; in this School, this applies to Groups A and B only.

**Relations with Other Schools of the University.** Any student, after securing one hundred and two trimester hours of credit in subject-matter Groups A, D, C and D, may, with the permission of his adviser, elect six hours a trimester for each of the remaining two years from work offered in any other School.

**Reserve Officers' Training Corps.** Students completing the curriculum of the Reserve Officers' Training Corps, as defined in General Order 49 of the War Department, will be allowed six trimester credits towards the Bachelor of Arts degree. These credits, however, will count as part of the six hours a trimester for the last two years, taken in other Schools, as explained in the preceding section.

**Thesis.** In the senior year a thesis in the student's major field of study will be required of all candidates for the Bachelor of Arts degree.

**Advisers.** The Dean and the Secretary of the School of Liberal Arts, together with the professor representing a prospective major, become the adviser of each student during his freshman year. The relation between adviser and student will be frank and fraternal, without restraint on either side. After the first year, the professor under whom the student does the major portion of his work becomes his adviser.

**General Restrictions on Elections.** Every student in electing work must bear in mind the following general restrictions: (1) Only courses may be chosen for which the student has had sufficient prerequisite training; (2) Only such courses may be elected as do not conflict on the University class-schedule; (3) A study once elected must be pursued through one year or to the completion of the subject; (4) The student's electives must exhibit a definite purpose; (5) All elections are subject to the approval of the student's adviser and one of the executive officers of the School of Liberal Arts.

## Graduate Courses

In certain departments of the School of Liberal Arts provisions are made for instruction toward advanced degrees. A description of courses

so offered follows the exclusively undergraduate courses. The general requirements for graduate degrees will be found in the sections devoted to the Graduate School.

Some time before the end of his first year in college the student must decide on his major study. This choice will be determined by the field that the student expects to be qualified to enter upon graduation. In order to acquaint the learner with some of the major interests for which the Arts faculty assume responsibility, the following type curricula sequences are submitted:

**English Teaching, the Ministry, Literary Work or General Education:** A student intending to become a teacher of English, to enter the ministerial field, to devote himself to literary work, or to acquire a thorough general education would usually major in the English Language and Literature, and during the last three years study: (sophomore year) English, Foreign Languages, History or Political Science, Psychology, or Mathematics, or Logic, Public Speaking, Military Instruction and electives; (junior year) English, Foreign Lanuages, History, Philosophy and electives; (senior year) English, Foreign Languages, Economics, Political Science and electives.

**Foreign Language Teaching, Foreign Political and Commercial Connections or Translation Work:** A student wishing to follow the various literary pursuits would major in Foreign Languages and during the last three years would study: |sophomore year) his major foreign language, English, a second foreign language, and electives consisting of Social Science and Natural Science; (junior year) his major language, English, a second language and electives consisting of Economics, Logic, Ethics and Psychology; (senior year) his major language, English a second language and electives consisting of Philosophy, Political Science and History.

**Law, History and Political Science Teaching, Politics or Consular Service:** A student wishing to follow History and Political Science would study during the last three years: (sophomore year) American State Government, American History, European History, Current History, Modern Language, Economics, Finance, Public Speaking, Psychology; (junior year) Constitutional Law, Municipal Government, European and American; Governments of Europe, Money and Banking, Sociology, Current History, European History, Public Speaking, Logic, Research in Political Science, Historiography; (senior year) Political Problems and Practical Politics Latin American Republics, American Political Ideals, The Far East, American Diplomacy, International Law, Ethics, Thesis

**Public Speaking:** Students preparing for the Law, the Ministry, Social Work, general or special lecture work, or any other professions of which public speaking is not only the base but also the positive medium through

which the professional activities must operate, may major in Public Speaking. In addition to the freshman studies prescribed for students in the School of Liberal Arts, the course includes the following: (sophomore year) Public Speaking, general and special; English Language, and electives consisting of Foreign Language Social Science and Natural Science; (junior year) Public Speaking, general and special; English Language, including Literature; and electives consisting of Foreign Language, Economics, Logic, Eethics, and Psychology; (senor year) Public Speaking, general and special; English Language, including Literature; and electives from Foreign Language, Philosophy, Political Science and History.

**Economics and Sociology:** Problems in Economics and Sociology form the subject matter of most legislation; these courses are therefore intended in a general way to train men and women for citizenship. More particularly, to provide economic and sociological training for technical students, certain required and elective courses have been worked out in consultation with the deans, supplementary to the work of the different schools. Primarily, those students who wish to follow any of the various lines of business are advised to major in economics and during the last three years would usually study: (sophomore year) a foreign language, social psychology, principles of economics, industrial history of the United States, markets and marketing, technical writing, general oradvanced accounting; (junior year) business law, corporation and finance, money and banking, labor problems, rural economics, rural organization; (senior year) public finance, insurance, transportation, scientific management, general sociology, political science and history, international relations.

## ENGLISH LANGUAGE AND LITERATURE

### For Short-Course Students

**Eng. 1-2. Practical Composition.** Three credit hours, first term. Three credit hours, second term. First year. Prerequisites, minimum entrance requirements for short-course students.

Elements, thought processes, types, structure, grammar, mechanical details and common errors of plain composition. Study and preparation of commercial letters, forms, articles, reports and advertisements. Regular practice in the writing of long and short themes.

**Eng. 3. Vocational Publications.** Two credit hours, third term. First year. Prerequisite, Eng. 1-2.

Reading and study of the leading periodicals, representative bulletins and significant association reports of the technical vocations, with special attention to agriculture and engineering. Written assignments.

## For Undergraduates

**Eng. 101-103. Composition and Rhetoric.** Three credit hours each term. Freshman year. Prerequisites, minimum entrance requirements in English. Required of all four-year students.

Parts, principles and conventions of effective thought communication. Reading, study and analysis of standard contemporary prose specimens. Daily short themes and periodical essays.

**Eng. 104-106. Technical Writing and Scientific Thought.** Two credit hours each term. Prerequisite, Eng. 101-103.

Advanced exposition. Principles of technical composition; examination and analysis of scientific bulletins, typical articles from technical publications, and scholarly monographs. Study of specimens of the best scientific thought. Practice in the composition of the leading forms of technical writing.

**Eng. 107-108. Nineteenth Century Poetry.** Three credit hours each term. First and second terms. Prerequisite, Eng. 101-103 or approval of the instructor.
the instructor.

Reading and criticism of Wordsworth, Coleridge, Byron, Shelley, Keats, Tennyson, Browning, Swinburne and their most distinguished contemporaries. Lectures on the history of English poetry, with special attention to the Romantic movement and the age of Victoria. Discussion of the nature of poetry, versification, style, critical methods and the relation of literature to social forces.

**Eng. 109. The Essay.** Three credit hours. Third term. Prerequisite, Eng. 101-103 or approval of the instructor.
approval of the instructor.

Development of the artistic elements of modern English prose and of the essay as a literary type. Reading and criticism of Bacon, Swift, Addison, Lamb, DeQuincey, Carlyle, Emerson, Macaulay, Ruskin and Arnold.

**Eng. 110. English Words.** Three credit hours. First term. Prerequisite, Eng. 101-103. Not given in 1920-21.

Practical study of the origin, growth, nature and use of the English vocabulary.

**Eng. 111-112. Literature in America.** Three credit hours each term. Second and third terms. Prerequisite, Eng. 101-103. Not given in 1920-21.

Critical study of Irving, Cooper, Bryant, Poe, Hawthorne, Emerson, Whittier, Longfellow, Lowell, Whitman and recent writers. Consideration of national life in American letters and America's contributions to world literature. Lectures, discussions, reports.

**Eng. 113-114. Novelists of the Nineteenth Century.** Three credit hours each term. First and second terms. Prerequisites, Eng. 101-103, Eng. 107-108 and Eng. 109. Given in 1920-21 and alternate years.

Reading of Scott, Jane Austen, Dickens, Thackeray, Hawthorne, George Eliot, Meredith, Hardy, Stevenson and others. Critical analysis in class of a few model novels, with special reference to characterization, plot and setting. Preparation of written critiques and short theses on assigned topics. Historical development of the novel traced by lectures.

**Eng. 115. The Short Story.** Three credit hours. Third term. Prerequisites, Eng. 101-103, Eng. 107-108 and Eng. 109. Given in 1920-21 and alternate years.

Lectures on the development and structure of the short story. Reading and study of all the recognized types. Critical reports and story-writing.

**Eng. 116. Early English Drama.** Three credit hours. First term. Prerequisites, Eng. 101-103, Eng. 107-108 and Eng. 109. Not given in 1920-21.

Development of pre-Shakespearean drama; examination of liturgical, mystery and miracle plays, Robinhood and St. George plays, moralities and interludes, and the early regular comedies and tragedies.

**Eng. 117-118. Elizabethan Drama.** Three credit hours each term. Second and third terms. Prerequisites, Eng. 101-103, Eng. 107-108, Eng. 109 and Eng. 116. Not given in 1920-21.

Shakespeare, his principal contemporaries and his immediate successors. Analysis, interpretative study and rapid reading. Consideration of Shakespeare in relation to his sources, his stage and general Elizabethan life. Lectures, collateral readings and reports.

**Eng. 119-120. Modern English Drama.** Three credit hours each term. First and second terms. Prerequisites, junior or senior standing and the approval of the instructor. Given in 1920-21 and alternate years.

Reading of representative plays by Dryden, Wycherley, Congreve, Farquahar and Vanbrugh; Goldsmith and Sheridan; Wilde, Pinero, Jones, Shaw, Galsworthy, Barker, Yeats and Synge; Fitch, Moody, Thomas and Mackaye. Written criticisms and reports. Lectures on the history of the English drama from 1642 to the present time.

**Eng. 121. Technique of the Drama.** Three credit hours. Third term. Prerequisites, junior and senior standing, Eng. 117-118 or Eng. 119-120, and approval of the instructor. Given in 1920-21 and alternate years.

Principles of dramatic construction and criticism. Lectures, discussions and practice.

FOR GRADUATES

**Eng. 201. Seminar.** Two credit hours each term.
Subject according to needs of students in attendance.

## ANCIENT LANGUAGES AND LITERATURES

### Greek

**A. L. 101-103. Beginners' Greek.** Three credit hours each term.
Drill and practice upon the fundamentals of Greek grammar and the acquisition of a vocabulary. To be followed by A. L. 104-106.

**A. L. 104-106. Grammar, Composition and Translation of Selected Prose Works.** Three credit hours each term. Second year course. Second-year course. Prerequisite, A. L. 101-103 or equivalent.
For those who offer Greek for entrance.

**A. L. 107-109. Greek Literature and Composition.** Three credit hours each term. Prerequisite, A. L. 104-106 or equivalent.
Study and translation of Greek prose and lyric poetry.

**A. L. 110-112. Greek Drama.** Three credit hours each term. Prerequisite, A. L. 107-109.
A study of the qualities of Greek dramatic poetry and Greek comedy. Translation of selected representative works and modern imitations of older works.

### Latin

**A. L. 121-123. Latin Prosody and Mythology.** Three credit hours each term.
Study and translation of selections from Virgil, together with a study of his life and influence. This course may be offered for entrance or taken as college work by those who offer only two units in Latin for entrance.

**A. L. 124-126. Latin Grammar, Composition and Translation.** Three credit hours each term.
Review of Latin grammar. Much practice in prose composition. Translation of selections from Livy, Cicero and Sallust. For those who offer four units for entrance.

**A. L. 127-129. Study of Roman Life and Customs.** Three credit hours each term. Prerequisite, A. L. 124-126.
Translation of selections from the Odes and proverbs of Horace and the letters and histories of Tacitus. This course alternates with A. L. 130-132.

**A. L. 130-132. Critical Study of Latin Drama.** Three credit hours each term. Prerequisite, A. L. 124-126.

Selected plays of Plautus and Terence. The course alternates with A. L. 127-129.

**A. L. 133-135 History of Roman Literature.** Three credit hours each term. Prerequisite, A. L. 127-129 or A. L. 130-132.

Lectures and translation of representative works.

## MODERN LANGUAGES AND LITERATURES

### French

#### For Undergraduates

**M. L. 101-103. Elementary French.** Three credit hours each term.

Drill in pronunciation, elements of grammar, composition, conversation and easy translation. For students who have entered college without French. To be followed by M. L. 104-106.

**M. L. 104-106. Second-year Cource. Grammar Continued.** Three credit hours each term. Prerequisite, M. L. 101-103 or equivalent.

Composition, conversation, dictation and reproductions. Reading and translation of selections from modern prose and poetry. For students who offer French for entrance.

#### For Advanced Undergraduates

**M. L. 107-109. Scientific French.** Three credit hours each term. Prerequisite, M. L. 104-106.

Reading and translation of scientific texts and journals. Discussions of word structure.

**M. L. 110-112. Development of the French Novel.** Three credit hours each term. Prerequisite, M. L. 104-106.

Detailed study of least three French novelists (one each term) with careful study of their lives, works and influence. This course alternates with M. L. 113-115.

**M. L. 113. Seventeenth Century French Drama.** Three credit hours. First term. Prerequisite, M. L. 104-106.

Analysis of the drama of the seventeenth century. Translation, collateral reading and reports. Alternates with M. L. 110-112.

**M. L. 114. Eighteenth Century French Drama.** Three credit hours. Second term. Prerequisite, M. L. 113.

A continuation of French 113.

**M. L. 115. Nineteenth Century French Drama.** Three credit hours. Third term. Prerequisite, M. L. 114.

Continuation of French 114, with recent developments in modern drama.

**M. L. 116-118. History of French Literature.** Three credit hours each term. Prerequisite, M. L. 110-112, or M. L. 113-115.

Study of French literature from the earliest times to the present. Reading and translation of representative works. Texts and lectures.

**M. L. 119-121. French for Engineers.** Five credit hours each term.

This course is a combination of M. L. 101-103 and M. L. 104-106. Drill upon the essentials of grammar. Oral exercises and composition. Study of texts from the beginning of the course. Practice in translation at sight. Recitation periods.

## German

### For Undergraduates

**M. L. 121-123. Beginning German.** Three credit hours each term.

Drill in pronunciation, elements of grammar, composition, conversation and dictation. For students who do not offer German for entrance.

**M. L. 124-126. Second-year German.** Three credit hours each term. Prerequisite, M. L. 121-123 or equivalent.

Syntax, composition, conversation, translation and reproduction. Selections from modern prose, poetry and fiction. For students who offer German for entrance.

### For Advanced Undergraduates

**M. L. 127-129. Scientific German.** Three credit hours each term. Prerequisite, M. L. 124-126.

Reading and translation of scientific texts and periodicals. Original reproductions of texts read. Lectures on scientific nomenclature.

**M. L. 130. Goethe and the Noved.** Three credit hours for first half-year. Prerequisite, M. L. 124-126. To be followed by M. L. 131. Given in alternate years.

Critical study of the life and works of Goethe together with the principals and development of the modern German novel.

**M. L. 131. Schiller and the Drama.** Three credit hours for the second half-year. Prerequisite, M. L. 130.

Detailed study of the life and works of Schiller and his relation to the drama.

**M. L. 132. Lessing and German Prose.** Three credit hours for the first half-year. Prerequisite, M. L. 124-126. To be followed by M. L. 133. This course alternates with M. L. 130.

**M. L. 133. Heine and German Poetry.** Three credit hours for the second half-year. Prerequisite, M. L. 132.

Extensive study of Heine and German Poetry. Collateral reading.

**M. L. 134-136. History of German Literature.** Three credit hours each term. Prerequisite, M. L. 130-131 or M. L. 132-133.

Study of German literature from the earliest times to the present. Reading and translation of representative works. Texts and lectures.

**M. L. 137-139. German for Engineers.** Five credit hours each term. Five recitation periods. Senior year.

This course is a combination of M. L. 121-123 and M. L. 124-126. Drill upon the fundamentals of grammar and syntax. Conversation and written reproductions of texts read. Original composition. Sight reading and much translation.

### Italian

**M. L. 138-140. Elementary Italian.** Three credit hours each term.

Open to those who have had two years of either French or Spanish. A thorough study of the essentials of Italian grammar, with the aim of acquiring a working vocabulary. Drill upon syntax. Constant practice in translation and easy composition.

### Spanish

At the end of the Sophomore year a student should be able to converse in Spanish as well as read and write it. The subject matter involved will be such as is ordinarily encountered by persons residing in Spanish-speaking countries. After this basic work a student has the option of two fields of specialization. The first line of specialization is concerned with the commercial needs of the United States in its relation, particularly, with the South American republics. Subjects receiving special attention are the trade interests of the proprietor and agent, The second line of major study has to do with the special interests of scholars and diplomats.

#### For Undergraduates

**M. L. 141-143. Grammar; Conversation.** Three credit hours each term. Freshman year.

Writing and reading of easy texts.

**M. L. 144. Thorough Knowledge of Grammar.** Three credit hours. First term. Sophomore year. Prerequisite, M. L. 143 or its equivalent.

Emphasis laid on the verb.

**M. L. 145. Reading and Conversation.** Three credit hours. Second term. Sophomore year. Prerequisite, M. L. 144 or its equivalent.

Reading of easy periodicals with direct application of M. L. 144. All instruction from this point on is given in Spanish.

**M. L. 146. Letter Writing.** Three credit hours. Third term. Sophomore year. Prerequisite, M. L. 145 or its equivalent.

Study of American Commercial methods in foreign countries.

**M. L. 147-148. Vocabulary of Trade.** Three credit hours each term. First and second terms. Junior year. Prerequisite, M. L. 146.

Special attention to the names of articles of hardware, agricultural implements, engineering instruments, etc. Trade problems assigned.

**M. L. 149. Business Correspondence and Etiquette.** Three credit hours. Third term. Junior year. Prerequisite, M. L. 148.

Direct application of M. L. 148 as used in the soliciting of trade. Actual copies of letters of South American business houses are taken as models.

**M. L. 150. Methods of Advertising in South American and Mexico compared with those of the United States.** Three credit hours. First term. Senior year. Prerequisite, M. L. 149, Jr. 112.

**M. L. 151-152. Study of Commercial Development.** Three credit hours each term. Second and third terms. Senior year. Prerequisite, M. L. 150, Ec. 101-102, Pol. Sc.

Study of commercial development and possibilities of the South American countries and the Philippines. Lectures by recognized authorities.

**M. L. 153-154. Early Spanish Literature.** Three credit hours each term. First and second terms. Junior year. Prerequisite, M. L. 146, H. 104-106, Pol. Sc.

Development of Spanish literature from the heroic period to the seventeenth century.

**M. L. 155. Seventeenth and Eighteenth Century Literature.** Three credit hours. Third term. Junior year. Three credit hours. First term. Senior year. Prerequisite, M. L. 154.

Critical study of selections from Cervantes, Calderon, Perez, Quevedo and others.

**M. L. 156. Spanish Literature after the Eighteenth Century.** Three credit hours. Second term. Senior year. Prerequisite, M. L. 155.

Selected readings from Ferrari, Ayala, Ibanez, and their contemporaries.

**M. L. 157. Literature of Spanish-Speaking Countries.** Three credit hours. Third term. Senior year.

Lectures with collateral reading, of the development of thought of the Latin-American countries and the Philippines.

**M. L. 158-160. Spanish for Engineers.** Five credit hours each term. Five recitation periods. Senior year.

Drill upon the fundamentals of grammar and syntax. Conversation and written reproductions of texts read. Original composition. Sight reading and much translation.

## HISTORY AND POLITICAL SCIENCE

### History

**H. 101-103. Current History.** One credit hour each term.

A study of the political, social, and economic problems of the day. Lectures and assignments.

**H. 104. American Colonial History.** Two credit hours. First term. Lectures. Term reports.

**H. 105. American Civil War and Reconstruction.** Two credit hours. Second term.

Lectures. Term reports.

**H. 106. Development of American Nationality.** Two credit hours. Third term.

Lectures. Term reports.

**H. 107. Latin American Republics.** Two credit hours. Third term. Senior year.

Influence of United States in Central and South America; Monroe Doctrine; Pan Americanism.

**H. 109-111. Modern and Contemporary History.** Two credit hours each term.

A study of the main events in European and American history since 1815.

**H. 112. Imperialism and World Politics.** Two credit hours. Second term. Not given in 1920-21.

A study of the political development in Europe, Canada, United States, and South America. Colonial expansion, League of Nations. Lectures and assigned readings.

**H. 113. Origins and Issues of the World War.** Two credit hours. Third term. Not given in 1920-21.

**H. 114-115. The Far East.** Two credit hours each term. Second and third terms. Senior year.

A study of the principal events—political, social and economic—in the development of the nations of the Far East. Special amphasis will be given to the relations between the nations of the Far East and United States.

**H. 116-118. Epochs in European History.** Two credit hours each term. Not given in 1920-21.

**H. 119-121. Historiography.** Two credit hours each term. Junior year. Not given in 1920-21.

A study of the method of writing history. Examination of the methods of prominent historians, and the development of assigned topics in technical form. Extensive use will be made of the material in the Library of Congress.

## Political Science

**Pol. Sc. 101-103. Government of the United States.** Two credit hours each term.

A study of the governmental system of the United States. Evolution of the Federal Constitution; functions of the Federal Government; the executive, legislative and judiciary departments. Lectures and assigned cases and readings.

**Pol. Sc. 104-105. American State Government.** Two credit hours each term. Sophomore year.

The development of American state constitutions; the structure and workings of state governments. Lectures and assigned readings.

**Pol. Sc. 106-108. Constitutional Law of United States.** Two credit hours each term. Prerequisites, Pol Sc. 101-103 and 104-105.

A study of the American constitution and its interpretation as based on the decisions of the Federal Courts and the Supreme Court of the United States. Lectures and assigned cases.

**Pol. Sc. 109-110. Governments of Europe.** Two credit hours each term. First and second terms. Prerequisites, Pol. Sc. 101-103 and 104-105. Not given in 1920-21.

A comparative study of the political organization of the principal states of Europe. Classification of forms; separation of powers; source of powers. Lectures and assigned readings.

**Pol. Sc. 111-112. Municipal Government.** Two credit hours each term. Second and third terms. Second term: Government of American Cities. Third term: Government of European Cities. Prerequisites, Pol. Sc. 101-103 and 104-105. Not given in 1920-21.

A study of city government. Source of power; organization and administration. City manager and commission forms of government. Lectures and assigned readings.

**Pol. Sc. 113-115. American Diplomacy.** Two credit hours each term. Senior year. Not given in 1920-21.

A survey of the beginnings of American diplomacy. Important foreign relations. Treaties and treaty making. Lectures and assigned readings.

**Pol. Sc. 116-118. International Law.** Three credit hours each term. Senior year. Given in 1921-22.

A study of the nature and sources of international law. Rights and duties of states; freedom of the seas. Lectures and assigned cases.

**Pol. Sc. 119-120. Political Parties and Practical Politics.** Two credit hours each term. First and second terms. Senior year. Not given in 1920-21.

The organization and methods of modern political parties; growth of party system. Lectures, assigned readings, and visits to Congress.

**Pol. Sc. 121. Contemporary Political Problems of the United States.** Two credit hours. Given in 1921-22.

National and international problems of current interest. Foreign relations; suffrage; labor problems. Lectures and assigned readings.

**Pol. Sc. 122-123. American Political Ideals.** Two credit hours each term. First and second terms. Not given in 1920-21.

American ideals as found reflected in the writings of Hamilton, Jefferson, Webster, and other great Americans. Lectures and assigned readings.

**Pol. Sc. 124-126. Research in Political Science.** Two credit hours each term. Given in 1921-22.

Practical work in the development of assigned problems in the College library and in the Library of Congress.

## ECONOMICS

**Econ. 101-102. Elements of Economics.** Three credit hours each term. First and second terms. Not open to freshmen, but required of students who elect to major in this department.

Elementary phases of the present system; production, exchange, distribution and consumption of wealth; the monetary system; public finance; land and labor problems; monopolies; taxation and other similar topics.

**Econ. 103. Corporation Finance.** Two credit hours. First term. Prerequisite, Econ. 101.

Methods employed in the promotion, capitalization, financial management, consolidation and reorganization of business corporations.

**Econ. 104. Money and Banking.** Two credit hours. Second term. Prerequisite, Econ. 101.

A study of the nature and functions of money; standards of value and prices; credit; bank clearings and exchanges; history of American and foreign banking; the stock exchange and the money market.

**Econ. 105. Public Finance and Taxation.** Two credit hours. Third term. Prerequisite, Econ. 101.

A study of public expenditures, receipts, indebtedness and financial administration; theories on public expenditures; theories of taxation; the growth and nature of public credit; the forms of public debts; federal, state and municipal budgets.

**Econ. 106. Economic History of the United States.** Three credit hours. First term.

A study of the growth of industry, agriculture, commerce, transportation from the simple isolated communities of the early colonies to the complex industrial and commercial society of to-day; its effect on the population in terms of successive new adaptations.

**Econ. 107. Rural Economics.** Two credit hours. Second term.

Agricultural markets and marketing; rural credit; tenancy and ownership; transportation; free delivery; intensive and extensive farming and kindred topics. Use will be made of bulletins published by the United States Department of Agriculture.

**Econ. 108. Elements of Accounting.** Three credit hours. Second term.

The application of fundamental principles of debit and credit entries t› different forms of bookkeeping; farm accounting; bank accounting; financial statements.

**Econ. 109. Advanced Accounting.** Three credit hours. Third term.

A continuation of Econ. 108, in which bulletins of the United States Department of Agriculture will largely furnish the subject matter. It will include a study of voucher systems and financial statements of government and private corporation accounting.

**Econ. 110-112. Commercial Law.** Three credit hours each term.

The aim of this course is to train students for practical business affairs by giving the legal information necessary to prevent the common business errors. The following are some of the phases of the work: Requisites and forms of contracts and remedies for their breach; sales, passage of title, warranties, and remedies; negotiable instruments, assignment negotiation, and liability of signers; agency; title, abstracts, mortgages, leases of property, etc.

## SOCIOLOGY

**Soc. 101. Elements of Sociology.** Three credit hours. Second term.

The life of society as affected by rural conditions, cities, wealth, poverty, heredity, immigration, etc.; the nature of social organization; different phases of social evolution; problems and principles of social control.

**Soc. 102. Charities and Corrections.** Three credit hours. Third term. Not given in 1920-21.

**Soc. 103. Rural Sociology.** Three credit hours. Third term.

Problems of rural life in the light of modern social science; federal and state organizations intended to promote rural welfare; purpose and achievements of such voluntary organizations as the Grange, the Farmers' Union, village improvement associations, boys' and girls' clubs, cooperative societies, etc.

**Soc. 104. Social Psychology.** Three credit hours. First term.

This course deals with such psychological matters as underlie the work in the fields of sociology and other social sciences. The fundamental instincts as dynamic forces in the individual and in society; their development, organization and control receive special attention.

**Soc. 105. Social Psyschology.** A continuation course of Soc. 104. Three credit hours. Second term.

A psychological analysis of some main features of an organized modern state.

**Soc. 106. Logical Aspects of Sociology.** Three credit hours. Third term.

This course seeks to apply the principles of logic to social phenomena. Nature of causal proof, grounds for universal judgments, statistical arguments, circumstantial evidence, analogical inference, experimental investigation, and nature and function of reasonable doubt in inductive inferences will be studied in their basic relation to actual sociological conditions. Practical problems of everyday life in their relation to the social order as discussed in the current literature and the press will furnish material for the student to test.

**Soc. 107. Philosophical Aspects of Sociology.** Three credit hours. First term.

A rapid survey of the leading systems of thought respecting social phenomena. The aim will be to show the genetic development of present day theory.

**Soc. 108. Philosophical Aspects of Sociology.** A continuation course of Soc. 107. Three credit hours. Second term.

The bearing of various concepts of ultimate reality, such as dualism and monism, atomism, theism and pantheism, on actual life conditions within various social groups.

**Soc. 109. Ethical Aspects of Sociology.** Three credit hours. Third term.

The application of moral principles to social phenomena. Nature of moral judgments and underlying ethical concepts as illustrations in current social problems.

## JOURNALISM

The curriculum in journalism not only gives the student an excellent knowledge of English and subjects coincident with general education, but provides courses wherein direct application of such knowledge is shown in actual publication of the modern newspaper. Besides taking up in a general way practically all phases of newspaper work, some courses in the curriculum are designed to give the student a knowledge of the specific conditions that apply to the development of trade journals, periodicals, magazines, and the weekly country paper.

**Jour. 101-102. News Writing.** Three credit hours each term. First and second terms. Sophomore standing required.

What constitutes news; news values; sources of news; gathering of news; types of newspaper stories.

**Jour. 103. The Daily Paper.** Three credit hours. Third term. Sophomore standing required.

A study of the methods and styles of the big metropolitan dailies; functions of a daily paper; file system; morgue; analysis of weekly papers; Sunday supplements; and syndicates.

**Jour. 104. History of Journalism.** One credit hour. First term. Junior standing required.

A study of journalism since its beginning, with special attention to the various types that developed in the nineteenth century; effect of journalism on world civilization and industrial development; relationship of journalism to the arts and sciences; present standards.

**Jour. 105-107. Newspaper Editing.** Two credit hours each term. Junior standing required.

Copy reading; proof-reading; general editorial supervision; type selection; printers' marks; problems of the copy-reader and proof-reader.

**Jour. 108-110. News and Editorial Writing.** Three credit hours each term. Prerequisite, Journalism 101-102.

The interview; general reportorial duties; newspaper correspondence; human interest; rewrites; interpretation of news; function of an editorial in the newspaper; study of sources of material for editorials; principles embodied in news and editorial writing; relationship of the editorial to the news story; exchanges.

**Jour. 111. The Country Newspaper.** Two credit hours. First term. Senior standing required.

A study of the conditions affecting the country paper; sources of news for it; kinds of editorials; and different emphasis placed on news values; and the problems confronting the average small town weekly paper in obtaining paper supplies; and putting news in type; advertising and circulation problems; relationship of the paper to its community.

**Jour. 112. The Trade Journal.** Two credit hours. Second term. Senior standing required.

Kinds of trade journals and their requirements for special articles; agricultural weeklies; publicity departments of great industrial organizations, and methods of operation.

**Jour. 113. Feature Writing.** Three credit hours. First term. Senior standing required.

Nature of the feature story; the narrative and the articles; kinds of material, and sources of material; treatment of topics and methods of handling features; markets for such material.

**Jour. 114-115. Agricultural and Industrial Feature Writing.** Three credit hours each term. Second and third terms. Senior standing required.

Applications of principles embodied in Journalism 113 to articles and stories of an agricultural nature, with particular reference to existing agricultural magazines, weekly farm papers, country papers, and agricultural departments of big dailies.

Special study of the technical demands of trade and industrial journals, kinds of material they are likely to accept, and a general application of the principles of Journalism 113 in preparation of articles for such papers.

**Jour. 116. Principles of Journalism.** One credit hour. First term. Senior standing required.

Ethics of the newspaper profession from the view of the editorial offices, the business office and the news department; relationship of the several departments of the newspaper and courtesies between newspaper men; laws of copyright, author's rights and libel.

**Jour. 117-118. Business Management, Circulation and Advertising.** One credit hour each term. Second and third terms. Senior standing required.

Problems encountered by the business manager, circulation manager, and advertising manager; methods of increasing circulation; development of new territory; analysis of markets; the advertising agency; national and local advertising; special type for advertising display; advertising rates; relationship of the cost of production of the newspaper to circulation and advertising.

**Jour. 119. Head Writing, Make-up, and Mechanical Details.** Two credit hours. First term. Senior standing required.

**118. Head writing, make-up, and mechanical details.** Two credit hours, first term. Senior standing required.

Kinds of type for use in heads; relationship of the head to the story; what the head should embody; mechanical details of the head; general

principles to be observed in making up the paper; placing of advertising; mechanics of the composing-room, the sterotyping-room, the press-room and problems in each.

**Jour. 120-121. Practical Newspaper Operation.** Ten hours each week. Second and third terms. Senior standing required.

This time will be devoted to the production of a regular weekly country newspaper, a monthly magazine, and a daily paper; a newspaper plant is to be installed at the University, and students will get actual experience in almost every phase of newspaper creation and production. Conditions in the modern newspaper plant are to be duplicated in every detail possible. Students will be given practical application of all the principles acquired during their previous three years of study.

## PUBLIC SPEAKING

### (In Preparation for Special Professions)

It is generally recognized that certain professions, using this term in both a special and a broad sense, not only have public speaking as a base, but that the very character of these professions is such that public speaking is the medium through which the professional activities must to a large extent operate. This particularly is true in the Law, in the Ministry, in social service work, and in lecture and extension work for public and private organizations.

The curriculum in Public Speaking, with special reference to professions, will be offered to students preparing for the professions named above and to those preparing for such other professions as justify public speaking as a major study. In this curriculum the student will elect from all the subjects offered in the School of Liberal Arts those particular studies which will best prepare him for the profession in view. Public speaking, both generally and specially applied, will run through the entire curriculum, and at the different stages of the student's progress in acquiring he will be taught to give oral expression to that which he has acquired. The general studies pursued give the educational preparation; the drill and oral expression create and develop the medium through which this preparation can be utilized and made efficient.

After the freshman year the students in this curriculum are elective, except the prescribed work in public speaking and English language. In addition to the regular courses in public speaking, specially adapted and prescribed courses will be given.

**P. S. 101-103. Reading and Speaking.** One credit hour each term. Freshman year.

A practical course in delivery. The principles and technique of vocal expression; enunciation, emphasis, inflection, force, gesture and general

delivery. Delivery of oratorical selections by students before the class, with criticisms and suggestions by instructor. Delivery of original speeches. Individual drill by appointment with instructor.

**P. S. 104-106. Oratory.** One credit hour each term. Open to students who have credit for P. S. 101-103.

The rhetoric of oral discourse. The speech for the occasion. Study of oratorical masterpieces. Practice in the writing and delivery or orations and general speeches and addresses.

**P. S. 107-109. Extempore Speaking.** One credit hour each term. Open to all students.

Theory and methods. The psychology of public speaking. Class exercises in speaking extemporaneously on assigned topics.

**P. S. 110-112. Debate.** One credit hour each term. Open to students who have credit for P. S. 101-103.

A study of the principles of argumentation. Study of masterpieces in argumentative oratory. Class exercises in debating.

**P. S. 113-115. Oral Reading.** Two credit hours each term. Open to all students.

Primarily for students intending to be teachers. Study of the technique of vocal expression. The oral interpretation of literary masterpieces. Study of methods of teaching oral reading in the schools.

**P. S. 116-118. Oral Technical English.** Three credit hours each term.

The preparation and delivery of lectures, speeches, reports, etc., on technical subjects. All composition required in the preparation of much of the above technical matter is criticized and corrected before the oral delivery. Required of engineering students.

**P. S. 119-121. Advanced Oral Technical English.** Three credit hours each term.

A continuation of P. S. 116-118. Required of engineering students.

## LIBRARY SCIENCE

**L. S. 101. Library Methods.** One credit hour. First term. Freshman year. Required of all Liberal Arts students. Elective for others.

This course is intended to help students use the library with greater facility. Instruction will be given by lectures and by practical work with the various catalogs, indexes and references books. This course considers the general classification of the library according to the Dewey System. Representative works of each division are studies in combination with the use of the library catalog. Attention is given to periodical literature, particularly that indexed in the Reader's Guide and Agri-

cultural Index. Book selection and a short bibliography on an assigned subject complete this course.

**L. S. 102. Advanced Library Methods.** Two credit hours. Second term. Prerequisites, L. S. 101 and Eng. 101-103.

A continuation of Library Science 101, emphasizing selection and purchase of books; administration of libraries; elementary work in classifying, cataloging and mending of books; charging and loan desk practice. Designed especially for those interested in prospective library work.

## MUSIC

In the Department of Music the courses of study are thorough and comprehensive, and the methods of instruction are along modern lines. The aim of this department is to teach music not only as an accomplishment, but also as an aid in the development of the highest type of manhood and womanhood. The ultimate aim is to train for life and to use the art of music as a means of intellectual, æsthetic and moral culture.

The instruction is planned to meet the personal needs of each student. Since students possess varying degrees of talent and diligence, it is impossible to estimate exactly the time required to complete a curriculum of study. Each student is advanced as rapidly as talent, application and thoroughness warrant.

### PIANO COURSES

**First Grade.** Beyer's Method, Book I of Matthews' Graded Course; studies in sight reading and pieces suitable for this grade.

**Second Grade.** Matthews' Graded Course, Book II, Köehler Studies, op. 242, and selections suitable to this grade.

**Third Grade.** Matthews' Graded Course, Books III and IV; Czerny's Etudes de la Velocite, op. 120 and 299 Book I; Lichner's sonatas; compositions from Mendelsohn, Mozart, Godard and others.

**Fourth Grade.** Matthews' Graded Course, Books V and VI; Czerny's Etudes de la Velocite, op. 299, Book II; Kuhlan's sonatas; studies from Bach, Brahms, Weber; also Mozart's easier sonatas.

**Fifth Grade.** Matthews' Graded Course, Books VII and VIII; Czerny's Etude de la Velocite, op. 299, Books III and IV; Cramer's Fifty Selected Studies, Books I and II; the more difficult of Mozart's sonatas and the easier of Beethoven's sonatas; compositions from Chopin, Schuman, Schubert and others.

**Sixth Grade.** Matthews' Graded Course, Books IX and X; Clemente's Gradus and Parnassum; the more difficult sonatas of Beethoven; composition from Chopin, Taussig, Rubenstein and others.

Special courses on all brass and reed instruments may also be arranged.

Each student who is pursuing a course in music will be assigned one or more periods daily; these assignments will be made in such a manner that neither instruction nor practice on the piano will conflict with the student's other academic interests.

Instruction may be begun at any time by such students as bring the director of music a receipt showing that they have met all the requirements explained above, to the full satisfaction of the college authorities.

# THE SCHOOL OF MEDICINE

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## FACULTY OF PHYSIC

J. M. H. ROWLAND, M. D., Dean

RANDOLPH WINSLOW, A. M., M. D., LL. D.

L. E. NEALE, M. D., LL. D.

JOHN C. HEMMETER, M. D., Ph. D., Sc. D., LL. D.

ARTHUR M. SHIPLEY, M. D.

SAMUEL K. MERRICK, M. D.

GORDON WILSON, M. D.

WILLIAM F. LOCKWOOD, M. D.

GEORGE W. DOBBIN, A. B., M. D.

WILLIAM ROYAL STOKES, M. D., Sc. D.

HARRY FRIEDENWALD, A. B., M. D.

ARCHIBALD C. HARRISON, M. D.

CARY B. GAMBLE, Jr., A. M., M. D.

WILLIAM S. GARDNER, M. D.

STANDISH McCLEARY, M. D.

JULIUS FRIEDENWALD, A. M., M. D.

HIRAM WOODS, A. M., M. D.

ALEXIUS McGLANNAN, A. M., M. D.

FRANK MARTIN, M. D.

## CALENDAR

### 1920-1921

June 1 to September 30.—Daily Clinics at University, Mercy and Maryland General Hospitals.

September 22.—Examination of Conditioned Students and Examination for Advanced Standing.

October 1.—Regular Session begins.

November 25.—Thanksgiving Recess begins. 6 p. m.

November 29.—Thanksgiving Recess ends. 9 a. m.

December 23.—Christmas Recess begins. 6 p. m.

January 3.—Christmas Recess ends.—9 a. m.

February 22.—Washington's Birthday.

March 24.—Easter Recess begins. 6 p. m.

March 29.—Easter Recess ends. 9 a. m.

June 1.—Commencement.

The School of Medicine of the University of Maryland is one of the oldest foundations for medical education in America, ranking fifth in point of age among the medical colleges of the United States. In the school building at Lombard and Greene streets in Baltimore was founded one of the first medical libraries and the first medical college library in America.

There for the first time in America dissecting was made a compulsory part of the curriculum; there instruction in Dentistry was first given (1837), and there were first installed independent chairs for the teaching of diseases of women and children (1867), and of eye and ear diseases (1873).

This School of Medicine was one of the first to provide for adequate clinical instruction by the erection in 1823 of its own hospital, and in this hospital intra-mural residency for senior students first was established.

### Clinical Facilities

The University Hospital, property of the University, is the oldest institution for the care of the sick in Maryland. It was opened in September, 1823, and at that time consisted of four wards, one of which was reserved for eye cases. Additions were made to this building from time to time, but the demands on it became so great that a complete new building was erected. The hospital now is one of the finest owned and controlled by any medical school in the country. It is equipped with all modern conveniences and requirements for care of the sick and for clinical instruction of students of the University.

Besides its own hospital, the Medical School has control of the clinical facilities of the Mercy Hospital, in which were treated last year more than 30,000 persons, the Maryland General Hospital, the Maternity hospital of the University, the Maryland Lying-In Hospital, Maryland Lying-In Asylum, the West End Maternity.

In connection with the University Hospital an out-door obstetrical clinic is conducted. During the past year 1,798 cases were treated in the lying-in hospitals connected with the University.

### Dispensaries and Laboratories

Three dispensaries associated with the University Hospital, Mercy Hospital, and Maryland General Hospital are organized on a uniform plan in order that teaching may be the same in all. Each dispensary has departments of Medicine, Surgery, Children, Eye and Ear, Genito-Urinary, Gynecology, Gastro-Enterology, Neurology, Orthopedics, Protology, Dermatology, Throat and Nose, and Tuberculosis. All students in their junior year work one day of each week in one of these dispensaries; all students in the senior year work one hour each day. About 46,000 cases treated last year give an idea of the value of these dispensaries for clinical teaching.

Laboratories conducted by the University purely for medical purposes are the Anatomical, Chemical, Experimental Physiology, Physiological Chemistry, Histology and Embryology, Pathology and Bacteriology, Clinical Pathology.

### Prizes and Scholarships

To stimulate study among the candidates for graduation the Faculty of the School of Medicine offers a gold medal to the candidate who passes the best general examination. Certificates of Honor are awarded to the five candidates standing next highest.

A prize of $50 is given each year by Mrs. Jose L. Hirsch as a memorial to the late Jose L. Hirsch, formerly Professor of Pathology in this School, to the student in the third year who has done the most satisfactory work in Pathology.

The Dr. Samuel Leon Frank Scholarship was established by Mrs. Bertha Frank as a memorial of the late Dr. Samuel Leon Frank, an alumnus of the University, and entitles the holder to exemption from payment of the tuition fee for the year. It is awarded each year upon nomination of the Faculty "to a medical student who, in the judgment of the said Faculty, is of good character and in need of pecuniary assistance to continue his fedical course."

From a bequest to the School of Medicine by the late Charles M. Hitchcock, M. D., an alumnus of the University, two scholarships have been established which entitle the holders to exemption from payment of tuition fees for the year.

These scholarships are awarded annually by the Faculty of Physic to students who have meritoriously completed the work of at least the first year of the curriculum in medicine, and who present to the Faculty satisfactory evidence of good moral character and of inability to continue the course without pecuniary assistance.

The Randolph Winslow Scholarship, established by Prof. Randolph Winslow, M. D., LL. D., entitles the holder to exemption from the payment of the tuition fee of that year.

It is awarded annually by the Trustees of the Endowment Fund of the University, upon nomination of the Faculty of Physic, to "a needy student of the senior, junior or sophomore class of the Medical School. He must have maintained an average grade of 85 per cent. in all his work up to the time of awarding the scholarship. He must be a person of good character and must satisfy the Faculty of Physic that he is worthy of and in need of assistance."

The University Scholarship entitles the holder to exemption from payment of the tuition fee of the year and is awarded annually by the Faculty of Physic to a student of the senior class who presents to the Faculty satisfactory evidence that he is of good moral character and is worthy of and in need of assistance to complete his work.

The St. John's College Scholarship is awarded annually by the Faculty of Physic upon the nomination of the president of St. John's College, of Annapolis, Md.

It entitles the holder to exemption from the payment of the tuition fee of that year.

The Frederica Gehrmann Scholarship was established by bequest of the late Mrs. Frederica Gehrmann and entitles the holder to exemption from payment of tuition fees. This scholarship is awarded to a second-year student who at the end of the year passes the best practical examination in Anatomy, Physiology, Physiological Chemistry and Pharmacology. This examination is competitive.

## REQUIREMENTS FOR ENTRANCE

Admission to the curriculum in medicine is by a completed Medical Student Certificate issued by the State Department of Education of Maryland. This certificate is obtained from the Department of Education on the basis of satisfactory credentials, or by examination and credentials, and is essential for admission to any class.

The requirements for the issuance of the Medical Student Certificate are:

(a) The completion of a standard four-year high school course or the equivalent, and in addition,

(b) Two years, sixty semester, or ninety trimester hours, of college credits, including chemistry, biology, physics and English.

Women are admitted to the Medical School of this University.

## (A) Details of the High School Requirement

1. Graduation from an accredited high school after pursuing a four-year course based upon an eight-year elementary course or its full equivalent; or

2. Successfully passing entrance examinations in the following subjects:

### *(a) Required Eleven (11) Units*

| | *Units* |
|---|---|
| English 4 years | 3 |
| Elementary and Intermediate Algebra | 1 |
| Plane Geometry (first five books) | 1 |
| Two years of a foreign language | 2 |
| Two of the three sciences—Biology, Chemistry, Physics | 2 |
| American History and Civics | 1 |
| Ancient History or English History | 1 |

### *(b) Electives, Four (4) Units*

(1) History and Political Science:

| | |
|---|---|
| Ancient History or English History | 1 |
| Mediæval and Modern History | 1 or ½ |
| General History | 1 or ½ |
| Civics | ½ |
| Economics | ½ |

(2) Language:

| | |
|---|---|
| French 2 years | 2 |
| German 2 years | 2 |
| Greek 2 years | 2 |
| Hebrew 2 years | 2 |
| Italian 2 years | 2 |
| Latin 1 or 2 years | 1 or 2 |
| Spanish 2 years | 2 |

(3) Mathematics:

| | |
|---|---|
| Advanced Arithmetic | ½ |
| Advanced Algebra | 1 |
| Plane Trigonometry | ½ |
| Solid Geometry | ½ |

(4) Science:

| | |
|---|---|
| Physics, Biology or Chemistry | 1 |
| Physical Geography and Geology | 1 |
| Astronomy | ½ |
| Physiology and Hygiene | ½ |

(5) Vocational and cultural subjects:

| | |
|---|---|
| Agriculture | 1 |
| Bookkeeping | 1 |
| Commercial Geography | ½ |
| Domestic Science | 1 |
| Drawing { Mechanical 1 and 2 | ½ each |
| Drawing { Freehand 1 and 2 | ½ each |
| Manual Training | 1 |
| Music | 1 |
| Stenography | 1 or 2 |

One unit in any subject is the equivalent of work in that subject for five periods per week for a year of at least thirty-six weeks, periods to be not less than forty-five minutes in length. One unit is equivalent to 2 semester credits or 2 points.

### (B) Details of the College Requirement

*a.* The preliminary college curriculum shall extend through two college sessions of at least thirty-two weeks each of actual instruction, including final examinations.

*b.* In excellence of teaching and in content, the work of this preliminary college curriculum shall be equal to the work done in the freshman and sophomore years in standard colleges and universities.

*c.* This preliminary college work shall include courses in physics, chemistry, biology and English, each course to embrace at least six, eight or twelve hours of work in each subject, as shown in the schedule following.

## SCHEDULE OF SUBJECTS OF THE TWO-YEAR PRE-MEDICAL COLLEGE COURSE

*Sixty Semester or Ninety Trimester Hours Required*

| | *Semester Hours* |
|---|---|
| REQUIRED COURSES: | |
| Chemistry (a) | 12 |
| Physics (b) | 8 |
| Biology (c) | 8 |
| English Composition and Literature (d) | 6 |

COURSES STRONGLY URGED:

A modern foreign language
Comparative vertebrate anatomy
Psychology
Social science

A semester hour is the credit value of sixteen weeks' work consisting of one lecture or recitation period per week, each period to be of not less than fifty minutes' duration net, at least two hours of laboratory work to be considered as the equivalent of one lecture or recitation period. A trimester hour is the same work pursued over a period of twelve weeks.

(a) CHEMISTRY. Twelve semester or eighteen trimester hours required, of which at least eight semester hours must be in general inorganic chemistry, including four semester hours of laboratory work. In the interpretation of this rule, work in qualitative analysis may be counted as general inorganic chemistry. The remaining four semester or six trimester hours required shall consist of work in organic chemistry.

(b) PHYSICS. Eight semester or twelve trimester hours required, of which at least two or three must be laboratory work. This course presupposes a knowledge of plane trigonometry.

(c) BIOLOGY. Eight semester or twelve trimester hours required, of which four or six must be laboratory work. This requirement may be satisfied by a course of eight semester or twelve trimester hours in either general biology or zoology, or by courses of four semester or six trimester hours each in zoology and botany, but not by botany alone. The requirement may be satisfied by six semester hours of college biology, including three semester hours in laboratory work, if preceded by a year (1 unit) of high school biology.

(d) ENGLISH COMPOSITION AND LITERATURE. The usual introductory college course of six semester or nine trimester hours, or its equivalent, is required.

## Fees and Expenses

Following are the fees for students in the Medical School:

| | |
|---|---|
| Matriculation fee (to be paid each year) | $ 5 |
| Tuition fee (each year) | 200 |

Estimated living expenses for students in Baltimore:

| *Items* | *Low* | *Average* | *Liberal* |
|---|---|---|---|
| Books | $ 27 | $ 48 | $ 75 |
| College Incidentals | 20 | 20 | 20 |
| Board, eight months | 200 | 250 | 275 |
| Room rent | 64 | 80 | 100 |
| Clothing and washing | 50 | 80 | 150 |
| All other expenses | 25 | 50 | 75 |
| *Total | $386 | $528 | $695 |

*Students take the pre-medical work at College Park, for which there is no charge for tuition and for which other expenses are detailed in the first part of the catalogue.

**The special bulletin of the School of Medicine may be obtained by addressing Dean J. M. H. ROWLAND, University of Maryland School of Medicine, Baltimore, Md., or The President, University of Maryland, College Park, Md.**

# THE LAW SCHOOL

## FACULTY

HENRY D. HARLAN, A. M.; L.L. B., Dean
HENRY STOCKBRIDGE, A. M.; L.L. B.
JOHN C. ROSE, L.L. D.
ALFRED S. NILES, A. M.; L.L. B.
RANDOLPH BARTON, Jr., A. B.; L.L. B.
EDWIN T. DICKERSON, A. M.; L.L. B., Secretary

The calendar for the opening of school and for holidays is the same as for the School of Medicine.

While the first faculty of law of the University of Maryland was chosen in 1813, and published in 1817 "A Course of Legal Study addressed to Students and the Profession Generally," which the *North American Review* pronounced to be "by far the most perfect system for the study of law which has ever been offered to the public," and which recommended a course of study so comprehensive as to require for its completion six or seven years, no regular school of instruction in law was opened until 1823. This was suspended in 1836 for lack of proper pecuniary support. In 1869 the Law School was organized, and in 1870 regular instruction therein was again begun. From time to time the course has been made more comprehensive and the Board of Instructors increased in number. Its graduates now number more than two thousand, and included among them are a large proportion of the leaders of the Bench and Bar of the State and many who have attained prominence in the profession elsewhere.

The Law School building adjoins the Medical School and part of its equipment is a large library, maintained for the use of the students, which contains carefully selected text-books on the various subjects embraced in the curriculum. No fee is charged for the use of the library. Other libraries also are available for students.

### Courses of Instruction

The courses of instruction in the Law School extend through three scholastic years of thirty-two weeks each, with an average of at least ten hours of class-room work each week, and aim to present a general and complete view of the science of law, with reference not only to its growth by judicial exposition, but also to the principles which have been engrafted upon it by positive enactment. The course of study embraces

both the theory and the practice of the law, and is designed thoroughly to equip the student for the practice of his profession, when he attains the Bar.

Scientific education is afforded in the principles of the Common Law, Equity, the Statutory Law of the State of Maryland and the Public Law of the United States.

Instruction is given by discussion of assigned cases and by lectures. The system of instruction embraces the study of assigned cases and of approved text-books. It is believed that instruction given through the use of cases alone is unnecessarily laborious, not conducive to uniformity, and likely to produce confusion in the students's mind unless supplemented by the aid of proper text-books. Accordingly a system of instruction, involving the use of both cases and text-books, is followed.

Students desiring to do so, may take elective or special courses. Such students are not candidates for the degree of Bachelor of Laws, but will receive certificates of proficiency in the branches pursued. Courses of instruction will be arranged with special reference to those desiring to obtain a knowledge of certain branches of the law, as an aid in business, or in the management of estates.

The Law School endeavors to uphold a high standard of legal education and it aims to give the student a comprehensive view of the whole field of the Law and particularly a knowledge of the fundamentals of American Law, in order to enable him to pass the examination for the Bar, if he has chosen the legal profession for his life work, or to fit him to care properly for his business interests, if he desires legal education merely as the accomplishment of the well-equipped man of business or man of culture.

The lectures are intended to present all the leading principles of the common law applicable to the subject, and the modification of the common law by statute, and to give illustrations of the application of the common and statute law. Special attention is given to the statutes in force in Maryland, and to peculiarities of the law in that State, where there are such; but the reasons for these statutory modifications and local peculiarities are explained so that the student may in a short time acquaint himself with the local peculiarities of the law in any State in which he may practice.

Readings from text-books and adjudicated cases are assigned on the subjects treated of in the lectures.

It will be seen that the full course of study extends over three years and as the Faculty is satisfied that students, who have not made considerable progress in the law before entering the Law School, would do

themselves and the School an injury by attempting to graduate in a shorter period, no student will be permitted to receive the degree of LL. B. until after three full years of study at this school, unless admitted to advanced standing.

### Requirements for Admission

Applicants for admission to the Law School must be at least eighteen years of age, must present evidence of good moral character and if candidates for the degree of Bachelor of Laws, will be required to give to the study of the law three scholastic years of at least thirty-two weeks each, with an average of at least ten hours' class-room work each week, and to have completed at the time of admission to the School a four years' high school curriculum or such a course of preparation as would be required for admission to the principal colleges and universities in Maryland; but persons who are unable to comply with these entrance requirements or to spend three years in the study of law may be received as special students, not candidates for the degree, and upon completing the whole or any part of the course, may receive certificates of proficiency in the work completed, according to standards to be fixed.

The Faculty will consider that students are properly qualified for entrance as candidates for the degree of Bachelor of Laws who have received a bachelor's degree from any reputable college or university, or certificate of graduation from any of the Normal of high schools of the State of Maryland, or other reputable institution of a similar character, or have certificates showing that they have passed the entrance examinations to one of the principal colleges or universities in Maryland or a college or university maintaining a standard equal thereto. In the absence of such degree or certificate, a candidate for the degree of LL. B. must file with the secretary, at the time of matriculation, a certificate from the Clerk of the Court of Appeals of Maryland, showing that he has been registered as a law student, as provided by Chapter 426 of the Acts of the General Assembly of Maryland, passed at the Session of 1918.

### Advanced Standing

Students may be admitted to advanced standing in the Senior or Intermediate classes upon satisfying the requirements for the work of the preceding year or years. These requirements may be met by presenting a certificate from any law school of accredited standing showing that the student has successfully completed equivalent courses in a law school, covering at least as many hours as are required for such subjects in this school. No credit will be given for study pursued in a law office.

### Graduation

The Law School confers the degree of Bachelor of Laws on students who have attended the course of lectures for three years, have attained the required standard in examinations, and in the Practice Court, and have submitted to the Faculty a satisfactory thesis.

## Fees and Expenses

The fees for each term are payable in advance at the commencement of each term, and tickets of admission to the lectures are issued only on payment of fees.

The charges for instruction are as follows:

| | |
|---|---|
| For term of four months | $ 50 |
| For session of eight months | 100 |

Special students will be charged according to the courses pursued.

There will be a matriculation fee of ten dollars charged and payable for each student at the time of matriculation and an additional charge of ten dollars to each graduate as a diploma fee.

Special arrangements may be made by members of the Bar, or others, not regular students of the Law School, for attending any particular part or branch of instruction at rates of charges in proportion to the above.

General living expenses of students are the same as outlined for the Medical School.

A special bulletin of The Law School may be obtained by addressing HENRY D. HARLAN, *Dean*, University of Maryland Law School, Baltimore, Md., or The President, University of Maryland, College Park, Md.

# THE SCHOOL OF DENTISTRY

## FACULTY

T. O. HEATWOLE, M. D., D.D. S., Dean

E. FRANK KELLY, Phar. D.

ELDRIDGE BASKIN, M. D., D.D. S.

ALEX H. PATERSON, D.D. S.

J. BEN ROBINSON, D.D. S.

B. MERRILL HOPKINSON, A. M., M. D., D.D. S.

ROBERT P. BAY, M. D.

ROBERT L. MITCHELL, Phar. G., M. D.

H. J. MALDEIS, M. D.

HORACE M. DAVIS, D.D. S.

The calendar for the School of Dentistry is the same as for the School of Medicine, except that the clinics are held in the Dental Infirmary of this School.

The course of instruction in the School of Dentistry covers a period of four Sessions of 32 weeks each, exclusive of holidays, in separate years.

The thirty-eighth regular session will begin October 1, 1920, and continue until about May 25, 1921. Full attendance during this period is demanded in order to get advancement to higher classes. Class examinations for the session will be held in October, January and May.

This department of the University is a member, in good standing, of the National Association of Dental Faculties, and conforms to all the rules and regulations of that body.

Aside from and independent of the regular session, this School maintains a spring and summer session, which follows immediately the termination of each regular session and continues until October 1st. This is intended for practical work only; no credit for time thus put in is allowed toward graduation. The many advantages of the spring and summer session for actual practice cannot be overestimated, as the number of patients applying for dental services is always very large and the Infirmary is never closed except on Sundays and holidays.

### Requirements for Matriculation

The requirements for matriculation in the School of Dentistry are those established by the Dental Educational Council of America, viz: graduation from an accredited high school having a four-year course, or its equivalent.

Applicants for matriculation must submit their credentials for verification to the *State Department of Education, Baltimore, Maryland.*

Applicants lacking full credentials may earn same by taking a stated written examination on subjects in which they are deficient.

### Attendance Requirements

In order to receive credit for a full session, each student must have entered and be in attendance not later than ten days after the beginning and remain until the close of the regular session.

In case of sickness, attested by a physician's certificate, students may enter twenty days after the opening of the regular session.

Graduates from reputable and accredited medical colleges are admitted to the Sophomore year and credits allowed on all subjects completed which are included in the Dental Course.

Students from other recognized dental colleges will be given credit for all work completed in the institution from which they come, except those entering for the Senior year only. These will be required to take the work of the full Senior courses of this School.

At the close of each session, each student must pass a satisfactory examination on the several subjects of that year before he can be entered in the succeeding grade.

The candidate for graduation must have attended four sessions of instruction in some recognized dental college, the last year of which must have been in this institution.

He must have satisfied the requirements of each of the several instructors and proved himself proficient in the theory and practice of Dentistry.

He must have attained the age of twenty-one years and be of good moral character.

### Matriculation and Fees

Students may matriculate by mail by sending money order, or registered letter containing the amount of fee, $5.00, to DR. T. O. HEATWOLE, *Dean*, corner Greene and Lombard streets, Baltimore, Md.

*The fees (with the exception of the Diploma fee), must be paid as follows: One-half on the entrance day, and the balance during the first week of the succeeding February.*

Matriculation (paid once only), $5.00. Tuition fee, $150.00. Diploma fee, $30.00. Dissecting fee (paid once only), $15.00. Laboratory fee, $5.00.

The Diploma fee must be paid by the first of April of the year of graduation.

A special ticket is issued at the close of each session to every student of the first, second and third year classes, as an evidence that he has been successful, or unsuccessful, in examinations for advancement to a higher grade, and also has attended a full session.

Special bulletin of the School of Dentistry may be obtained by addressing Dean T. O. HEATWOLE, University of Maryland School of Dentistry, Baltimore, Md., or The President, University of Maryland, College Park, Md.

# THE SCHOOL OF PHARMACY

## FACULTY

E. F. KELLY, Phar. D., Dean

DAVID M. R. CULBRETH, A. M., Phar. G., M. D.

HENRY P. HYNSON, Ph. D.

CHARLES C. PLITT, Phar. G.

LOUIS J. BURGER, Phar. D., LL. B.

H. J. MALDEIS, M. D.

DANIEL BASE, Ph. D.

J. CARLTON WOLF, Phar. D.

ROBERT L. MITCHELL, Phar. D., M. D.

H. E. WICH, Phar. D.

GEORGE A. STALL, Phar. D.

The calendar is the same as for the School of Medicine, except for the statement in the latter about clinics.

The School of Pharmacy was organized in 1841, largely at the instance of members of the Faculty of Medicine, and, for a time, the lectures were delivered at the Medical School. Later it became separated and continued an independent organization until, as the Maryland College of Pharmacy, it finally became an actual part of the University. With but one short intermission, previous to 1865, it has continuously exercised its functions as a teaching school of pharmacy.

Reference to its records shows it to have been among the first, in every instance, to adopt advanced methods, and the standards it has always set and maintained have equalled the highest. It was the first school of pharmacy to employ separate professors for all branches taught; it is the pioneer in establishing laboratories for practical teaching and exercise, it took the initiative in providing adequate buildings for advanced teaching; it was among those which early added plant histology, pharmacognosy, volumetric analysis and alkaloidal assay as distinct branches, and the first to add a separate chair of commercial pharmacy and dispensing, whereby students may be given better and larger experimental knowledge of the actual practice of pharmacy than can be obtained at the average drug store.

## Equipment and Degrees

The School of Pharmacy has at its disposal for laboratory instruction and lectures several large and well-equipped halls in the University buildings in Baltimore. From the beginning the chief aim of the School has been to prepare its students for the intelligent practice of pharmacy in the modern drug store.

In doing this, it takes into consideration that there exist three distinct divisions of the profession—preparation, collection and dispensing, which is the manufacturer, jobber and retailer—and that all need to be scientifically taught. The School has so arranged its curriculum as to give a well-ordered foundation for a pharmaceutical specialist in two years. Upon completion of this two-year curriculum, the student is graduated with the degree Graduate in Pharmacy, Ph. G. Students who continue their studies for one year after completion of the basic two years' work will receive the degree of Pharmaceutical Chemist, Ph. C.

The School of Pharmacy holds membership in the American Conference of Pharmaceutical Faculties and is registered in the New York Department of Education, and all other states which maintain registration bureaus. The American Conference of Pharmaceutical Faculties is organized to promote pharmaceutical education, and all schools holding membership in it are required to maintain certain standards for entrance and graduation.

## Requirements for Admission

The applicant must be not less than seventeen years old and must have completed a four-year standard high school curriculum, or its equivalent. The course, or its equivalent, must have included one year of Latin. Two years of Latin, however, are more desirable.

Admission to the curriculum in pharmacy is by certificate issued by the State Department of Education, Baltimore, Md. The certificate is issued on the basis of credentials, or by examination, or both. Evaluation of credentials can be made by the Department of Education only, and all applicants, whether their entrance qualifications are clearly satisfactory as per the requirements for matriculation outlined above, or not, must secure a certificate from said Department of Education to be presented to the Dean before they will be allowed to matriculate.

Applicants should secure a Census Blank from the Credential Clerk of the Department of Education, or from the Dean of this School, properly fill it out and return it at the earliest possible date, together with the fee of two dollars (Money Order). Diplomas or certificates need not be sent. The Department of Education will secure all credentials desired after the Census Blank has been received. The applicant will be notified of the result of the investigation; if his preparation is sufficient, he will be granted a certificate of entrance.

This certificate, carrying the approval of the State Department of Education, will receive recognition by authorities of other states.

Applicants, whose credentials do not meet the requirements, must stand an examination in appropriate subjects to make up the required number of units. The fee for such examination is one dollar per subject; five dollars for the entire number of subjects.

Credit will be given for first-year subjects to students only coming from schools of pharmacy holding membership in the American Conference of Pharmaceutical Faculties, provided they present a proper certificate of the satisfactory completion of such courses, and meet the entrance requirements of this School.

### Requirements for Graduation

1. The candidate must possess a good moral character, and must be twenty years old.

2. He or she must have attended two sessions at a school of pharmacy, the last *in all instances*, at this school. Credit will be given only for first-year subjects which have been successfully completed in a school or college holding membership in the American Conference of Pharmaceutical Faculties. The student also must have had four years of high school work.

3. He or she must have passed an examination in all lecture and laboratory instruction.

4. On or before May 1st the candidate must present the graduation fee and a letter from his or her parents or some authorized person certifying to his or her age.

### Fees and Expenses

| | |
|---|---|
| Matriculation fee | $ 5 |
| For full first year | 110 |
| For full second year | 115 |
| Graduation fee | 15 |
| Deposit to cover breakage | 5 |

If the student desires to remain in school for the third year to obtain the degree of Pharmaceutical Chemist the tuition will be $125.

Living expenses are practically the same as those detailed for students of the Medical School.

The special bulletin of the School of Pharmacy may be obtained by addressing E. F. KELLY, *Dean*, University of Maryland School of Pharmacy, Baltimore, Md., or The President, University of Maryland, College Park, Md.

# SCHOOL OF EDUCATION

The School of Education consists of an organization of the various activities of the University which are concerned with the professional preparation of teachers. Its courses are planned to serve three classes of students: First, those preparing to teach agriculture, home economics, industrial and general subjects in secondary schools; second, prospective principals of high schools, educational supervisors, county agents, home demonstrators, boys' and girls' club workers, and other extension workers; third, those majoring in other lines of work who desire courses in education and psychology for their professional and informational value.

## CURRICULA

Two general classes of curricula leading to the degrees of Bachelor of Science and Bachelor of Arts are offered.

The first of these provides fixed courses permitting comparatively little election for the definite purpose of preparing teachers and supervisors of agriculture, home economics, manual training, and industrial subjects.

The second class provides a wide range of electives and seeks to train superintendents, principals and teachers of general high school subjects. Although there are definite and fixed basic requirements, the student may choose from a number of subjects the major subject in which he expects to qualify for teaching. Correlated with this may be other subjects which he may wish to teach.

All students wishing to prepare for teaching should consult the Dean of the School of Education regarding the arrangement of their work. Upon matriculation each student is required to state his major interest and in the election of courses to secure the advice and approval of the head of the department in which his major falls. The previous training of the student, his experience, and his future needs govern the head of the department in his recommendations.

## TEACHERS' SPECIAL DIPLOMAS

The degrees granted for work done in the School of Education indicate primarily the quantity of work completed. Teachers' special diplomas certify to the professional character of such work. Teachers' special diplomas will be granted only to those who, besides qualifying for a degree, give promise of superior professional ability as evidenced by their personality, character, experience, and success in supervised teach-

ing. Teachers' special diplomas will be granted in agricultural education, home economics education, manual training, industrial education, and in general education.

The recipient of a teacher's special diploma is eligible for certification by the State Superintendent of Schools without examination.

## SPECIAL COURSES

By special arrangement courses in education are offered evenings and on Saturdays to teachers in service and to those who may qualify for teaching in the schools of Maryland after having had such work. College credit will be granted for this work if taken in course. Only a limited amount of service of this character can be undertaken by the faculty of the School of Education in any year. School officials should make application for this work before arranging for it in their counties.

As the need for evening classes in industrial and home economics education arises, special courses will be offered at centers throughout the State. The number and location of these centers will depend entirely upon the need and demand for such instruction. The courses will be organized on the short unit basis and will be maintained only as long as the demand justifies it. Upon the satisfactory completion of such special curricula, students will be issued certificates of proficiency.

In summer special courses are offered for the benefit of teachers in service and such individuals as may be able to qualify for teaching upon the completion of the work.

## GENERAL EDUCATION.

Since the student electing this curriculum may become a candidate for either the Bachelor of Arts or the Bachelor of Science degree, he should upon his matriculation state the degree for which he wishes to qualify. Students wishing to prepare for the teaching of English, history, the social sciences, and language should become candidates for the degree of Bachelor of Arts. Those wishing to teach general and biological sciences, chemistry, and physics should become candidates for the degree of Bachelor of Science.

Students should also state the subjects in which they expect to qualify for teaching, designating a major and a minor interest; they should complete approximately sixty-three hours in their major and related subjects and twenty-seven hours in their minor and related subjects.

Candidates for the Bachelor of Arts degree must complete, in addition to the requirements of the curriculum, a minimum of eighteen credit hours of science, at least nine of which must be in biology; and must

have completed a minimum of thirty-six credits in foreign language. Candidates for the Bachelor of Science degree must complete, in addition to the requirements of the curriculum, nine hours of history and nine hours of language.

Students electing this curriculum must register either in the School of Liberal Arts, Education, Chemistry, or College of Agriculture. In any case they must register with the School of Education for the special teacher's diploma.

**GENERAL EDUCATION.**

| FRESHMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Language (Spanish, French, German, Italian, Latin or Greek) | 3 | 3 | 3 |
| Educational Guidance (Ed. 101-103) | 1 | 1 | 1 |
| Public Speaking (Pub. Spk. 101-103) | 1 | 1 | 1 |
| Library Science (Lib. Sci. 101) | 1 | ..... | ..... |
| Military or Physical Education | 2 | 2 | 2 |
| AND TWO OF THE FOLLOWING GROUPS: | | | |
| GROUP I— | | | |
| General Chemistry (Gen'l Chem. 101-102) | 4 | 4 | ..... |
| Qualitative Analysis (Gen'l Chem. 103) | ..... | ..... | 4 |
| GROUP II— | | | |
| General Zoology (Zool. 101-102) | 3 | 3 | ..... |
| General Botany (Bot. 101) | ..... | ..... | 4 |
| GROUP III— | | | |
| American Colonial History (H. 104) | 2 | ..... | ..... |
| Civil War and Reconstruction (H. 105) | ..... | 2 | ..... |
| Development of American Nationality (H. 106) | ..... | ..... | 2 |
| Current History (H. 101-102) | ..... | 1 | 1 |
| GROUP IV— | | | |
| Mathematics (Math. 106-108) | 3 | 3 | 3 |

SOPHOMORE YEAR.

| | | | |
|---|---|---|---|
| Public Education in the U. S. (Ed. 101) | 2 | ..... | ..... |
| General Applied Psychology (Psy. 101-102) | ..... | 2 | 2 |
| Technical Composition (Eng. 104-106) | 2 | 2 | 2 |
| Major | 5 | 5 | 5 |
| Minor | 2 | 2 | 2 |
| Military or Physical Education | 2 | 2 | 2 |
| Electives | 5–7 | 5–7 | 5–7 |

JUNIOR YEAR.

| | | | |
|---|---|---|---|
| Educational Psychology (Ed. 102) | 5 | ..... | ..... |
| Survey of Teaching Methods (Ed. 103) | ..... | 5 | ..... |
| Education 104 or 105 | ..... | ..... | 5 |
| Principles of Economics (Econ. 101-102) | 3 | 3 | ..... |
| Public Finance (Econ. 106) | ..... | ..... | 3 |
| Major | 5 | 5 | 5 |
| Minor | 2 | 2 | 2 |
| Electives | 2–3 | 2–3 | 2–3 |

| SENIOR YEAR. Term: | I | II | III |
|---|---|---|---|
| Principles of Secondary Education (Ed. 107) | 3 | ..... | ..... |
| *Supervised Teaching of General Subjects (Ed. 106) | ..... | ..... | ..... |
| Major | 5 | 5 | 5 |
| Electives | 8–10 | 8–10 | 8–10 |

*Given any term. Credit not to exceed five hours.

### Requirements for a Degree.

Upon the satisfactory completion of two hundred and four trimester hours, under the restrictions and requirements prescribed above, the student will be recommended for the degree of Bachelor of Arts or for the degree of Bachelor of Science, depending upon the character of the work elected.

## AGRICULTURAL EDUCATION

In addition to the regular entrance requirements of the University, involving graduation from a standard four-year high school, students electing the agricultural education curriculum must present evidence of having acquired adequate farm experience after reaching the age of fourteen years.

The electives allowed by this curriculum may be selected from any of the courses offered by the University for which the student has the necessary prerequisites.

A student is expected, however, to confine his elections to subjects related to farming and to teaching. Though opportunity is afforded for specialization in a particular field of agriculture, such as animal husbandry, agronomy, pomology, vegetable gardening and farm management, students should arrange their work so that at least forty per cent of their time will have been spent on technical agriculture, twenty-five per cent on scientific subjects, twenty per cent on subjects of a general educational character and from twelve to fifteen per cent on subjects in professional education.

Students electing this curriculum must register either in the College of Agriculture or the School of Education. In either case they must register with the School of Education for the special teacher's diploma.

### AGRICULTURAL EDUCATION.

| FRESHMAN YEAR. | | | |
|---|---|---|---|
| Cereal Crops (Agron. 101) | 4 | ..... | ..... |
| Animal Husbandry (An. Hus. 101) | ..... | 4 | ..... |
| Elementary Vegetable Gardening (Hort. 101) | ..... | ..... | 4 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| General Zoology (Zool. 101-102) | 3 | 3 | ..... |
| General Botany (Bot. 101) | ..... | ..... | 4 |
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Public Speaking (Pub. Sp. 101-103) | 1 | 1 | 1 |
| Military | 2 | 2 | 2 |
| Educational Guidance (Ed. Guid. 101-103) | 1 | 1 | 1 |

SOPHOMORE YEAR.

| | | | |
|---|---|---|---|
| Public Education in the U. S. (Ed. 101) | 2 | ..... | ..... |
| Elementary Pomology (Hort. 102) | 4 | ..... | ..... |
| Grain Judging (Agron. 102) | ..... | 1 | ..... |
| Forage Crops (Agron. 103) | ..... | ..... | 4 |
| Principles of Dairying (D. H. 101) | 3 | ..... | ..... |
| Dairy Production (D. H. 102) | ..... | 3 | ..... |
| Plant Physiology (Plt. Psy. 101-102) | ..... | 3 | 3 |
| Soils (Soils 101-102) | ..... | 3 | 3 |
| Geology (Geol. 101) | 3 | ..... | ..... |
| General and Applied Psychology (Psy. 101-102) | ..... | 2 | 2 |
| Military | 2 | 2 | 2 |
| Electives | 4–6 | 4–6 | 4–6 |

JUNIOR YEAR.

| | | | |
|---|---|---|---|
| Educational Psychology (Ed. 102) | 5 | ..... | ..... |
| Survey of Teaching Methods (Ed. 103) | ..... | 5 | ..... |
| Methods in Secondary Vocational Ag'l (Ag. Ed. 101) | ..... | ..... | 5 |
| Feeds and Feeding (An. Hb. 102) | 4 | ..... | ..... |
| Farm Poultry (An. Hb. 104) | ..... | ..... | 3 |
| Tech. Writing and Scientific Thought (Eng. 104-106) | 2 | 2 | 2 |
| Social Science | 3 | 3 | ..... |
| Electives | 4–6 | 6–8 | 6–8 |

SENIOR YEAR.

| | | | |
|---|---|---|---|
| Problems in Agricultural Education (Ag. Ed. 102-104) | 1 | 1 | 1 |
| The Rural Community and Its Education (Ag. Ed. 106) | ..... | 3 | ..... |
| Principles of Secondary Education (Ed. 107) | 3 | ..... | ..... |
| *Supervised Teaching of Ag'l Subjects (Ag. Ed. 105) | ..... | ..... | ..... |
| Farm Management | 3 | 3 | ..... |
| Electives | 10–12 | 10–12 | 15–17 |

*Given any term. Credit not to exceed five hours.

### Requirements for a Degree

Upon the satisfactory completion of two hundred and four trimester hours under the restrictions and requirements prescribed above, a student will be recommended for the degree of Bachelor of Science.

## HOME ECONOMICS EDUCATION

In addition to the regular entrance requirement of the University, involving graduation from a standard four-year high school, students electing home economics education must present evidence of two years' experience in the home as a house daughter during which time a large share of the responsibility in the management of the home was assumed.

Students may elect from other schools such courses as they may be qualified to enter. They are expected, however, to confine their elections primarily to subjects related to home making and teaching. The curriculum should be so arranged that approximately forty per cent. of the

student's time will be spent on technical home economics subjects, twenty-five per cent on subjects of general academic character and from twelve to fifteen per cent on subjects of a professional character.

Students electing this curriculum register in the School of Home Economics and with the School of Education for the special teacher's diploma.

**HOME ECONOMICS EDUCATION.**

| FRESHMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| *Garment Construction (Clothing 101) | 2 | ..... | ..... |
| Drafting and Elementary Dress Design (Cloth. 102) | 4 | ..... | ..... |
| Dressmaking (Cloth. 103) | ..... | 3 | ..... |
| Textiles 101 | ..... | 1 | ..... |
| Foods 101 | ..... | ..... | 6 |
| Composition and Design (Art 101) | ..... | 2 | ..... |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Educational Guidance | 1 | 1 | 1 |
| Physical Education | 2 | 2 | 2 |
| Electives | 2–4 | 2 | 2 |

*Students with high school training in Textiles and Clothing presenting satisfactory credentials are not required to take Clothing 101.

| SOPHOMORE YEAR. | | | |
|---|---|---|---|
| Public Education in the U. S. (Ed. 101) | 2 | ..... | ..... |
| General and Applied Psychology (Psy. 101-102) | ..... | 2 | 2 |
| Foods 102 | ..... | 4 | ..... |
| Costume Design (Art. 103) | ..... | ..... | 3 |
| Laundering (Textiles 102) | 2 | ..... | ..... |
| Advanced Textiles (Textiles 103) | 1 | ..... | ..... |
| Household Management (H. M. 101) | ..... | ..... | 3 |
| Organic Chemistry (Gen'l Chem. 112-113) | 3 | 3 | ..... |
| Botany 101 | ..... | ..... | 4 |
| Zoology 101-102 | 3 | 3 | ..... |
| Physical Education | 1 | 1 | 1 |
| Electives | 4–6 | 3–5 | 3–5 |

| JUNIOR YEAR. | | | |
|---|---|---|---|
| Educational Psychology (Ed. 102) | 5 | ..... | ..... |
| Survey of Teaching Methods (Ed. 103) | ..... | 5 | ..... |
| Methods in Secondary Voc. Home Ec. (H. E. Ed. 101) | ..... | ..... | 5 |
| Freehand Perspective (Art. 102) | 2 | ..... | ..... |
| Home Architecture and Design (Art. 105) | ..... | 2 | ..... |
| Household Management (H. M. 102) | ..... | 3 | ..... |
| Home Management (H. M. 103) | ..... | ..... | 5 |
| Clothing 104 | 2 | ..... | ..... |
| Bacteriology 101-103 | 3 | 3 | 3 |
| Physical Education | 1 | 1 | 1 |
| Electives | 3–5 | 3–5 | 3–5 |

| SENIOR YEAR. | | | |
|---|---|---|---|
| Problems in Home Econ. Edu. (H. E. Ed. 102-103-104) | 1 | 1 | 1 |
| †Supervised Teaching (H. E. Ed. 105) | ..... | ..... | ..... |
| Physiological Chemistry (Bio-Chem. 101) | 4 | ..... | ..... |
| Nutrition (Foods 105) | ..... | 5 | ..... |
| Dietetics (Foods 106) | ..... | ..... | 5 |
| Child Care and Welfare (H. E. Ed. 109) | ..... | ..... | 2 |
| Electives | 10–12 | 10–12 | 8–10 |

†Given any term. Credit not to exceed five hours.

### Requirements for a Degree

Upon the satisfactory completion of two hundred and four trimester hours, under the restrictions and requirements prescribed above, a student will be recommended for the degree of Bachelor of Science.

## INDUSTRIAL EDUCATION

Three types of curricula are offered in Industrial Education, viz., a four-year curriculum,, a two-year curriculum and a special curriculum. The first two are offered as resident work at the University and the third is offered at special centers in the State where occasion demands.

## FOUR-YEAR CURRICULUM IN INDUSTRIAL EDUCATION FOR TEACHERS OF RELATED SUBJECTS

In addition to the regular entrance requirement of the University, involving graduation from a standard four-year high school, students electing the four-year curriculum in industrial education must be willing to engage in the trades or industries during the three summer vacations.

The electives allowed by this curriculum may be chosen from any of the courses offered in the University for which the student has the necessary prerequisites.

**INDUSTRIAL EDUCATION.**

**(Four-year curriculum for teachers of related subjects.)**

| FRESMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| Trigonometry or Solid Geometry (Math. 101 or 102) | 5 | ..... | ..... |
| Analytics (Math. 103) | ..... | 5 | 5 |
| Freehand Drawing (Dr. 101) | 1 | ..... | ..... |
| Mechanical Drawing (Dr. 102) | 1 | 1 | ..... |
| Descriptive Geometry (Dr. 105) | ..... | ..... | 3 |
| Technical Instruction (M. E. 101) | 1 | 1 | ..... |
| Woodwork (Shop 101) | 1 | 2 | 1 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Educational Guidance (Prin. Ed. 101-103) | 1 | 1 | 1 |
| Military | 2 | 2 | 2 |
| Summer Work in Trade or Industry | ..... | ..... | ..... |

| SOPHOMORE YEAR. Term: | I | II | III |
|---|---|---|---|
| Public Education in the U. S. (Ed. 101) | 2 | ..... | ..... |
| General Psychology (Prin. Ed. 105-106) | ..... | 2 | 2 |
| Advanced Algebra (Math. 104) | 3 | ..... | ..... |
| Calculus | ..... | 3 | 3 |
| Mechanics and Sound (Phys. 101 and Phys. Lab. 101) | 5 | ..... | ..... |
| Elec. and Magnetism (Phys. 102 and Phys. Lab. 102) | ..... | 5 | ..... |
| Heat and Light (Phys. 103 and Phys. Lab. 103) | ..... | ..... | 5 |
| Graphic Statics (Mech. 101) | ..... | 3 | ..... |
| Descriptive Geometry (Dr. 106) | 4 | ..... | ..... |
| Drafting (Dr. 108) | ..... | ..... | 1 |
| Steam Engines (M. E. 102) | 3 | ..... | ..... |
| Technical Mechanics (M. E. 103) | ..... | 2 | ..... |
| Analytical Mechanics (Mech. 102) | ..... | ..... | 3 |
| Blacksmithing (Shop 105) | ..... | 2 | ..... |
| Foundry (Shop 108) | ..... | ..... | 2 |
| Machine Work (Shop 108) | ..... | ..... | 1 |
| Military | 2 | 2 | 2 |
| Summer Work in Trade or Industry | ..... | ..... | ..... |

JUNIOR YEAR.

| | | | |
|---|---|---|---|
| Educational Psychology (Ed. 102) | 5 | ..... | ..... |
| Survey of Teaching Methods (Ed. 103) | ..... | 5 | ..... |
| Methods in Ind. Edu. for Secondary Schools (Ind. Ed. 101) | ..... | ..... | 5 |
| Elementary Machine Design (D. Des. 101) | 2 | ..... | ..... |
| Machine Design (M. Des. 102-103) | ..... | 3 | 4 |
| Dynamos and Motors (E. E. 111-112) | 2 | 2 | ..... |
| Electrical Engineering Lab. (El. Lab. 102-103) | 1 | 1 | ..... |
| Experimental Engineering (Exp. Lab. 102) | ..... | ..... | 1 |
| Materials of Construction (Mech. 105) | ..... | 2 | ..... |
| Hydraulics (Hyd. 101) | ..... | ..... | 3 |
| Machine Work (Shop 110) | 3 | ..... | ..... |
| Oral and Technical English (P. S. 116-118) | 1 | 1 | 1 |
| Electives | 3–6 | 3–6 | 3–6 |
| Summer Work in Trade or Industry | ..... | ..... | ..... |

SENIOR YEAR.

| | | | |
|---|---|---|---|
| Problems in Industrial Education (Ind. Ed. 102-104) | 2 | 2 | 2 |
| History of Industrial Education (Ind. Ed. 106) | ..... | 3 | ..... |
| *Supervised Teaching in Ind. Education (Ind. Ed. 105) | ..... | ..... | ..... |
| Principles of Secondary Education (Ed. 107) | 3 | ..... | ..... |
| Social Sciences | 3 | 3 | 3 |
| Hydromechanics (Hyd. 103) | 3 | ..... | ..... |
| Experimental Engineering (Exp. Lab. 104) | 1 | 2 | 1 |
| Primary and Secondary Batteries (E. E. 110) | ..... | 2 | ..... |
| Heating and Ventilation (M. E. 106) | ..... | ..... | 3 |
| Lights and Illumination (E. E. 105) | ..... | ..... | 3 |
| Electives | 5–8 | 5–8 | 5–8 |

*Given any term. Credit not to exceed five hours.

### Requirements for a Degree.

Upon the satisfactory completion of two hundred and four trimester hours under the restrictions and requirements prescribed above, a student will be recommended for the degree of Bachelor of Science.

## TWO-YEAR CURRICULUM IN INDUSTRIAL EDUCATION FOR TEACHERS OF RELATED SUBJECTS

This curriculum is designed for mature students who have had considerable experience in some trade or industry.

In addition to the above, applicants for admission to this curriculum must have as a minimum requirement an elementary school education or its equivalent and must be willing to engage in the trades and industries during the summer vacation.

The curriculum will not be rigidly required as laid down, but will be made flexible, in order that it may be adjusted to the needs of students who present advanced credits for certain of the required courses.

### INDUSTRIAL EDUCATION.

**(Two-year curriculum for teachers of related subjects.)**

| FIRST YEAR. Term: | I | II | III |
|---|---|---|---|
| Essentials of Methods | ..... | 3 | ..... |
| Methods in Industrial Education (Ind. Ed. 101) | ..... | ..... | 5 |
| Mechanical Drawing (Dr. 2) | (6) | (6) | (6)* |
| Foundry (Shop 6) | ..... | ..... | 6* |
| Power Plant Operation (M. E. 5) | (3) | ..... | ..... |
| Carpentry (Shop 3) | (6) | ..... | ..... |
| Technical Instruction (M. E. 3) | 2 | 2 | 2 |
| Elementary Physics (Phys. 1) | 3(3) | 3(3) | 3(3) |
| Chemistry (Chem. 1) | 2(3) | 2(3) | ..... |
| Composition (Eng. 2) | 3 | 3 | 3 |
| Electives | ..... | ..... | 2–3 |
| Summer Work in Trade or Industry | ..... | ..... | ..... |

*Alternative.

| SECOND YEAR. | | | |
|---|---|---|---|
| Problems in Industrial Education (Ind. Ed. 102) | 2 | 2 | 2 |
| †Supervised Teaching in Indus. Education (Ind. Ed. 104) | ..... | ..... | ..... |
| Direct Current (E. E. 1) | 2(3) | 2(3) | ..... |
| Alternating Currents (E. E. 2) | ..... | ..... | 4(3) |
| Technical Mechanics (M. E. 4) | 2 | 2 | 4 |
| Shop Mathematics (Shop 4) | 1 | 1 | ..... |
| Plane Geometry (Math. 5) | 3 | ..... | ..... |
| Plane Trigonometry (Math. 6) | ..... | 3 | ..... |
| Applied Mathematics (Math. 7) | ..... | ..... | 3 |
| Electives | 6–7 | 6–7 | 3–4 |

†Given any term. Credit not to exceed five hours.

### Requirements for a Teacher's Special Diploma.

Upon the satisfactory completion of the curriculum as laid down, or its equivalent, under the restrictions and regulations presented above, the student who gives promise of superior professional ability will be recommended for a Teacher's Special Diploma.

## SPECIAL COURSES FOR TEACHERS OF TRADE AND RELATED TRADE SUBJECTS

To meet the needs for industrial teacher training in Baltimore, two types of courses are offered of evenings in that city—one for teachers of trade subjects, the other for teachers of related trade subjects. The courses open about the last of September and close about the last of April. The class for teachers of trade subjects meets twice a week, the one for teachers of related trade subjects meets once a week. The recitation period in all cases is two hours.

Applicants for admission to these classes must have had considerable experience in the line of work they expect to teach, and must have, as a minimum requirement, an elementary school education or its equivalent. The credit allowed for these courses depends upon the amount and character of the work completed.

For teachers of trade subjects the term's work deals with the analysis and classification of trade knowledge for instructional purposes, the mechanics and technique of teaching, shop and class-room management, and the organization of industrial classes. The work for teachers of related subjects is similar to that described for teachers of trade subjects except that emphasis is placed upon the analysis of their specialties in relationship to the different trades with which they are articulated.

## DESCRIPTION OF COURSES

### Education

**Ed. 101. Public Education in the U. S.** Two credit hours. First term. Open to sophomores, juniors, and seniors. Required of sophomores in Education.

It is the purpose of this course to introduce the student to present day problems of education by means of a study of public education in the United States, with the emphasis on secondary education and its reorganization.

**Ed. 102. Educational Psychology.** Five credit hours. First term. Open to juniors and seniors. Required of Juniors in Education. Prerequisite, Psy. 101-102.

A study of instincts and their appearance, the psychology of learning; mental tests and measurements; individual differences; and the mental development and characteristics of children during the successive school ages.

**Ed. 103. Survey of Teaching Methods.** Five credit hours: Four lectures and one laboratory. Second term. Open to juniors and seniors. Required of juniors in Education. Prerequisite, Ed. 102.

A course dealing with the teaching process; the nature of objectives; the lesson plan; observation, critiques; teaching methods; type lessons; and motivation.

**Ed. 104. Methods in Secondary English, History and the Languages.** Five credit hours: four lectures and one laboratory. Third term. Open to juniors and seniors. Required of juniors in General Education who are candidates for the degree of Bachelor of Arts. Prerequisite, Ed. 103.

This course deals with the aims; content; sources of materials; analysis and arrangement of subject matter; psychology of the subjects; special methods; note book and other necessary auxiliary work.

**Ed. 105. Methods in the Secondary School Sciences.** Five credit hours: four lectures and one laboratory. Third term. Open to juniors and seniors. Required of juniors in General Education who are candidates for the degree of Bachelor of Science. Prerequisite, Ed. 103.

This course deals with the aims; content; sources of materials; analysis and arrangement of subject matter; psychology of the subjects; special methods; equipment and its proper use; note books and other necessary auxiliary work.

**Ed. 106. Supervised Teaching of General Subjects.** Credit not to exceed five hours, depending on the amount and character of work done. Given any term. Senior year.

Class teaching, conferences, lesson plans and critiques.

**Ed. 107. Principles of Secondary Education.** Three credit hours. First term. Open to seniors and to graduate students by special arrangement. Required of seniors in General, Agricultural and Industrial Education.

A study of the evolution of secondary education; the articulation of the secondary school with the elementary school, colleges, technical schools, the community and the home; the junior high school, programs of study and the reconstruction of curriculums; the teaching staff and student activities.

**Ed. 108. Theory of Vocational Education.** Three credit hours. Third term. Open to advanced undergraduate and graduate students by special arrangement.

A study of the development of vocational education; educational and social forces behind the movement; terminology; types of industrial schools; technical high schools, vocational education for girls; vocational education in rural communities; recent legislation.

### Educational Guidance

**Ed. Guid. 101-103. Educational Guidance.** One credit hour each term. Freshmen year. Required of freshmen in Education.

This course is designed to assist freshmen students in Education in adjusting themselves to the demands and problems of college and professional life, and to guide them in the selection of college work during subsequent years. Among the topics discussed are the following: Student finances; student welfare; health; althletics; general reading; mental recreation; principal and methods of study; the use of the library; student organizations; student government; the purpose of the college; the election of courses and the selection of extra curriculum activities.

## PSYCHOLOGY

**Psy. 101-102. General and Applied Psychology.** Two credit hours each term. Second and third terms. Open to sophomores, juniors and seniors. Required of sophomores in Education.

This course embraces a study of human life from the biological point of view; the nervous system; attention, interest, instincts; reflexes; habit, effort; personality; the psychology of efficiency; the application of psychology, to advertising, salesmanship, employment, and education.

## AGRICULTURAL EDUCATION

**Ag. Ed. 101. Methods in Secondary Vocational Agriculture.** Five credit hours. Third term. Open to juniors and seniors. Required of juniors in Agricultural Education.

This course embraces a study of the purposes of secondary vocational agriculture; types of schools offering such instruction; vocational analysis; the arrangement of vocational information for instructional purposes; curriculums; daily programs; the farm job as the unit of instruction; the place of auxiliary knowledge; the analysis, classification and arrangement of farm jobs and auxiliary knowledge for instructional purposes; lesson plans; observation; critiques; methods of the class period; the home project method and its administration; methods in other supervised practical work; plant and equipment; the relation of the agricultural teacher to the school system.

**Ag. Ed. 102-104. Problems in Agricultural Education.** One credit hour each term: One laboratory period. Senior year. Required of seniors in Agricultural Education. Prerequisite, Ag. Ed. 101.

The work of this course embraces a study of problems in administration; methods; organization materials; and equipment.

**Ag. Ed. 105. Supervised Teaching of Agriculture.** Credit not to exceed five hours. Determined by the amount and character of work done. Required of seniors in Agricultural Education. Prerequisite, Ag. Ed. 101.

Class teaching; observation; lesson plans; conferences; and critiques.

**Ag. Ed. 106. The Rural Community and Its Education.** Three credit hours. Second term. Senior year. Required of seniors in Agricultural Education. Prerequisite, Ag. Ed. 101.

A study of the history, structure, and forces at work in rural communities as a basis for determining the educational needs of such communities and the duties of rural teachers.

**Ag. Ed. 107. Methods in Agricultural Extension..** Two credit hours. Third term. Open to juniors and seniors.

This course is given under the supervision of the Extension Service and is designed to equip men to enter the broad field of extension work. The course will cover methods of assembling and disseminating the agricultural information that is available for the practical farmer. It will include administration, organization, supervision and the practical details connected with the work of a successful county agent, club worker, and extension specialist.

**Ag. Ed. 108. Agricultural Extension Practice.** Credit not to exceed two hours. Determined by amount and character of work done. Given any term. Open to a limited number of seniors in Agricultural Education. Prerequisite, Ag. Ed. 107.

This practice course is given under the supervision of the Extension Service and is especialy designed to give young men practical experience in the conduct of extension work. Students will be required to engage in specialists', county agents' and boys' club work as assistants always under the guidance of experienced men in the respective fields. Traveling expenses for this course will be adjusted according to circumstances, the ability of the man, and the service rendered.

## HOME ECONOMICS EDUCATION

**H. E. Ed. 101. Methods in Secondary Vocational Home Economics.** Five credit hours. Third term. Required of juniors in Home Economics Education.

The purposes of Secondary Vocational Home Economics; a study of types of class-room work and management as observed in high schools; discussion of the methods of teaching; the relation of home economics to the school and home; the planning of lessons and courses of study suitable to the methods and purpose of vocational home economics; analysis of the various home activities in preparation for the home

project; organization of the project; supervision and project reports.

**H. E. Ed. 102-104. Problems in Home Economics Education.** One credit hour each term. Required of seniors in Home Economics Education. Prerequisite, H. E. Ed. 101.

This course includes the study of problems in administration; organization; materials; and equipment.

**H. E. Ed. 105. Supervised Teaching of Home Economics.** Credit not to exceed five hours. Determined by the amount and character of work done. Prerequisite, H. E. Ed. 101.

Practice in planning and presenting of courses; conferences and critiques.

**H. E. Ed. 106-107. History of the Family.** Two credit hours. First and second terms.

This course includes the history of the family from early ages to the present time; the industrial revolution and its effects upon family life; and an examination of the present situation and tendencies as they affect the life of the American family.

**H. E. Ed. 108. Education of Women.** Two credit hours. Third term.

Woman's work and her industrial and economic conditions are studied with reference to the home and to society. Opening of occupations and professions to women; a study of modern problems of woman and the home, suffrage, education, economic function of woman and the family.

**H. E. Ed. 109. Child Care and Welfare.** Two credit hours. Third term. Required of seniors in Home Economics Education.

This course deals primarily with the training of children and includes such topics as health habits and child psychology.

**H. E. Ed. 110. Methods in Home Economics Extension Work.** Two ocredit hours. Third term.

The course will take up the study of subject matter and administrative problems in home economics extension, demonstrations, and the use of graphic materials. Emphasis will be placed upon the improvement of the country home through organization and practical demonstrations as conducted in this State.

## INDUSTRIAL EDUCATION

**Ind. Ed. 101. Methods in Industrial Education for Secondary Schools.** Five credit hours. Third term. Open to juniors and seniors. Required of juniors in Industrial Education.

Types of industrial schools; vocational and trade analysis; the place of auxiliary knowledge; related trade courses; lesson plans; methods;

critiques; the industrial school population; materials and equipment; the relation of the industrial teacher to the school system.

**Ind. Ed. 102-104. Problems in Industrial Education.** Two credit hours each term: two laboratory periods. Senior year. Required of seniors in Iudustrial Education.

A consideration of the problems of the related trade teacher as they arise in connection with trade analysis; practice teaching; lesson plans; observation; critiques; methods; discipline; organization; management.

**Ind. Ed. 105. Supervised Teaching of Industrial Subjects.** Credit not to exceed five hours. Determined by the amount and character of work done by the student.

Class teaching; lesson plans; observations; critiques.

**Ind. Ed. 106. History of Industrial Education.** Three credit hours. Second term. Senior year.

A study of the origin and development of industrial education in the light of group needs; industrial education in the United States; the development of schools; present problems in reorganization.

# THE SCHOOL OF CHEMISTRY

Curricula offered in the School of Chemistry prepare students for practical work as research, general analytical, and manufacturing chemists, or to be teachers. Contributory instruction also is given, as most of the students enrolled in other schools of the College are required to take a year or more of chemistry.

Five coördinate departments make up the School of Chemistry. They are organized as follows:

Department of General Chemistry,
Department of Industrial Chemistry,
Department of Biological Chemistry,
Department of Physical Chemistry.
Department of Fertilizer and Food Analysis and Inspection.

The chemical building contains laboratories, offices, and balance room for the State fertilizer, feed and lime control work, lecture rooms, supply room and four student laboratories. In addition, classrooms in Morrill Hall are used as needed. The laboratories are well equipped with standard apparatus and chemicals, chemical and assay balances, polariscopes, refractometers, spectroscopes, microscopes, etc. Each student is provided with a locker, reagents, and apparatus, and has the use of a working desk.

The school is provided with a library of standard reference books on chemistry and related subjects, to which necessary additions are made from time to time.

## GENERAL CHEMISTRY

The curriculum offered by the Department of General Chemistry leading to the degree of Bachelor of Science presents the opportunity for a broad training in chemistry. In order that students may become not merely capable analytical chemists, but also may be grounded as deeply as possible in the fundamental principles of all departments of chemical work, practical laboratory manipulation is brought into close relationship with lectures, demonstrations and the work of the classroom. The work prepares students to fill positions in analytical or manufacturing chemistry, as chemists in technical industry, as chemical, sanitary, or consulting experts. The course is well adapted for students wishing to take graduate work in chemistry, as it gives a broad and general knowledge of the science.

## GENERAL CHEMISTRY.

| FRESHMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Public Speaking (P. S. 101-103) | 1 | 1 | 1 |
| Algebra (Math. 106) | 3 | ..... | ..... |
| Plane Trigonometry (Math. 107) | ..... | 3 | ..... |
| Plane Analytic Geometry (Math. 108) | ..... | ..... | 3 |
| Mod. Language (M. L. 101-103 or 121-123) | 3 | 3 | 3 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| Zoology (Zool. 101-102) | 3 | 3 | ..... |
| Botany (Bot. 101) | ..... | ..... | 4 |
| Basic R. O. T. C. Course (M. I. 101) | 1 | 1 | 1 |

SOPHOMORE YEAR.

| | | | |
|---|---|---|---|
| Adv. Inorganic Chem. (Phys. Chem. 101-103) | 3 | 3 | 3 |
| Adv. Qualitative Analysis (Gen'l Chem. 104) | 3 | ..... | ..... |
| Quantitative Analysis (Gen'l Chem. 105-106) | ..... | 3 | 3 |
| Plane Analytic Geometry (Math. 109) | 3 | ..... | ..... |
| Calculus (Math. 110) | ..... | 3 | 3 |
| Physics (Phys. 101-103) | 5 | 5 | 5 |
| Mod. Language (M. L. 104-106-124-126) | 3 | 3 | 3 |
| Basic R. O. T. C. Course (M. I. 101) | 1 | 1 | 1 |

JUNIOR YEAR.

| | | | |
|---|---|---|---|
| Organic Chemistry (Gen'l Chem. 114-116) | 4 | 4 | 4 |
| Adv. Quantitative Analysis (Gen'l Chem. 117-119) | 4 | 4 | 4 |
| Bacteriology (Bact. 101-103) | 3 | 3 | 3 |
| Economic (Econ. 101-103) | 3 | 3 | 3 |
| Elective | 3 | 3 | 3 |

SENIOR YEAR.

| | | | |
|---|---|---|---|
| Physical Chemistry (Phys. Chem. 104-105) | 4 | 4 | ..... |
| Electro Chemistry (Phys. Chem. 107) | ..... | ..... | 4 |
| Colloid Chemistry (Phys. Chem. 106) | ..... | ..... | 4 |
| Physiological Chemistry (Bio. Chem. 101) | 4 | ..... | ..... |
| Plant Biochemistry (Bio. Chem. 102) | ..... | ..... | 3 |
| Industrial Chem. (Ind. Chem. 107-108) | 5 | 5 | ..... |
| English (Eng. 104-106) | 2 | 2 | 2 |
| Elective | 2 | 6 | 4 |

**Gen'l Chem. 101-103. General Chemistry and Qualitative Analysis.** Four credit hours each term: three lectures and one laboratory period. The first term. Two lectures and two laboratory periods. The second and third terms.

A study of the non-metals and metals. The non-metals are first considered. Special attention is given those elements and compounds which are of industrial importance. The laboratory work accompanying this course in the first term consists, chiefly, of experiments illustrative of the work in the class. During the last two terms systematic qualitative analysis of the more common bases and acids is the laboratory work pursued.

**Gen'l Chem. 104. Advanced Qualitative Analysis.** Three credit hours: three laboratory periods. The first term. Prerequisite, Gen'l Chem. 101-103.

An advanced course of Qualitative Analysis for chemical students.

**Gen'l Chem. 105-106. Quantitative Analysis.** Three credit hours: three laboratory periods. The second and third terms. Prerequisites, Gen'l Chem. 101-103, 104.

The principal operations of quantitative analysis. Standardization of chemical balance. Stardardization of weights and apparatus used in chemical analysis. Typical gravimetric volumetric, colorimetric and electrolytic methods are taken for study.

**Gen'l Chem. 107-108. Quantitative Analysis.** Three credit hours: one lecture and two laboratory periods. The first and second terms. Prerequisite, Gen'l Chem. 101-103.

Quantitative analysis for agricultural students. Typical gravimetric and volumetric methods.

**Gen'l Chem. 109. Technical Analysis.** Two credit hours: two laboratory periods. The second term. Prerequisites, Gen'l Chem. 101-103.

The analysis of oils, fuels, gases, boiler waters, etc., for students in engineering.

**Gen'l Chem. 110. Determinative Mineralogy and Assaying.** Three credit hours: one lecture and two laboratory periods. Third term. Prerequisites, Chem. 101-103, 104.

This is a course of determinative mineralogy. The more important minerals are identified by their characteristic physical and chemical properties. Assays of gold, silver, copper and lead, etc., are made.

**Gen'l Chem. 111. Metallurgical Calculations.** Two credit hours: two lectures. The second term.

A course of problems embodying the use of physical, chemical and mechanical principles utilized in practical metallurgy.

**Gen'l Chem. 112-113. Organic Chemistry.** Three credit hours each term: two lectures and one laboratory period. The first and second terms. Prerequisite, Gen'l Chem. 101-103.

A study of the aliphatic and aromatic compounds. The course is designed primarily for agricultural students.

### For Graduates and Advanced Undergraduates

**Gen'l Chem. 114-116. Advanced Organic Chemistry.** Four credit hours each term: three lectures and one laboratory period. The year. Prerequisites, Gen'l Chem. 101-103 (105-106 or 107-108)).

This course is particularly designed for advanced students and offers a detailed study of the typical organic compounds.

**Gen'l Chem. 117-119. Advanced Quantitative Analysis.** Four credit hours each term: two lectures and two laboratory periods. Prerequisites, Gen'l Chem. 101-103, 104-106.

A continuation of courses 105-106. An advanced course of quantitative analysis where the student may elect to study the methods used in agricultural, biological, or industrial chemistry.

### For Short-Course Students

**Gen'l Chem. 1. General Chemistry.** Two lectures and one laboratory period. The first and second terms.

This course consists of an elementary study of general chemistry, with special reference to the chemistry of plants, animals, soils, fertilizers, etc., for students in the two-year course in agriculture.

## INDUSTRIAL CHEMISTRY

Curricula in the Department of Industrial Chemistry are Chemical Engineering and Agricultural Chemistry. The former is designed to equip students with a highly specialized knowledge of the construction and management of manufacturing establishments involving chemical principles; the latter prepares for research and analytical work that have to do with the relationship of chemistry to agriculture. Technical and educational positions are open to men and women trained in various phases of chemical engineering, in plant and animal chemistry, in the analysis of soils, fertilizers, and spray materials, and in food and dairy studies.

In addition to many of the subjects in chemistry, chemical engineering includes the study of boilers, steam engines, drawing and design, elements of machinery, measurement of power, and work in the engineering laboratory. It also includes advanced courses in electricity and magnetism, dynamos and motors, and experimental practice in the electrical and dynamo laboratories. However, the graduates primarily are chemists with a good knowledge of mechanical and electrical engineering, and with additional training in the special mechanical and electrical appliances of industrial chemistry.

## CHEMICAL ENGINEERING.

| FRESHMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| Composition and Rhetaric (Eng. 101-103) | 3 | 3 | 3 |
| Public Speaking (P. S. 101-103) | 1 | 1 | 1 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| Trigonometry (Math. 101) | 5 | ..... | ..... |
| Analytics (Math. 102-103) | ..... | 5 | 5 |
| Plane Surveying (Surv. 101-102) | ..... | 2 | 1 |
| Freehand Drawing (Dr. 101) | 1 | ..... | ..... |
| Mechanical Drawing (Dr. 102-103) | 2 | 1 | ..... |
| Engineering Drawing (Dr. 104) | ..... | 1 | ..... |
| Descriptive Geometry (Dr. 105) | ..... | ..... | 3 |
| Woodwork (Shop 103) | 1 | ..... | ..... |
| Basic R. O. T. C. Course (M. I. 101) | 1 | 1 | 1 |

### SOPHOMORE YEAR.

| | | | |
|---|---|---|---|
| Adv. Inorganic Chem. (Phys. Chem. 101-103) | 3 | 3 | 3 |
| Adv. Qualitative Anal. (Gen'l Chem. 104) | 3 | ..... | ..... |
| Quantitative Analysis (Gen'l Chem. 105-106) | ..... | 3 | 3 |
| Physics (Phys. 101-103) | 5 | 5 | 5 |
| Adv. Algebra (Math. 104) | 3 | ..... | ..... |
| Calculus (Math. 105) | 2 | 5 | 5 |
| Steam Engines (M. E. 102) | 3 | ..... | ..... |
| Analytical Mechanics (Mech. 102) | ..... | ..... | 3 |
| Graphic Statistics (Mech. 101) | ..... | 3 | ..... |
| Basic R. O. T. C. Course (M. I. 101) | 1 | 1 | 1 |

### JUNIOR YEAR.

| | | | |
|---|---|---|---|
| Organic Chemistry (Gen'l Chem. 114-116) | 4 | 4 | 4 |
| Adv. Quantitative Analysis (Gen'l Chem. 117-119) | 4 | 4 | 4 |
| Mod. Language (French 104 or German 104) | 5 | 5 | 5 |
| Technical Composition (Eng. 104) | 1 | 1 | 1 |
| Dynamos and Motors (E. E. 111-112) | 2 | 2 | ..... |
| Electrical Engineering Lab. (El. Lab. 102-103) | 1 | 1 | ..... |
| Hydraulics (Hyd. 101) | ..... | ..... | 3 |

### SENIOR YEAR.

| | | | |
|---|---|---|---|
| Physical Chemistry (Phys. Chem. 104-105) | 4 | 4 | ..... |
| Electro Chemistry (Phys. Chem. 107) | ..... | ..... | 4 |
| Colloid Chemistry (Phys. Chem. 106) | ..... | ..... | 4 |
| Industrial Chemistry (Ind. Chem. 107-108) | 5 | 5 | ..... |
| Economics (Econ. 101-103) | 3 | 3 | 3 |
| Heat Engineering (M. E. 104-105) | 2 | 3 | 3 |
| Hydromechanics (Hyd. 103) | 3 | ..... | ..... |
| Metallurgical Calculations (Gen'l Chem. 111) | ..... | 2 | ..... |
| Min. and Assaying (Gen'l Chem. 110) | ..... | ..... | 3 |

## AGRICULTURAL CHEMISTRY.

| FRESHMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Public Speaking (P. S. 101-103) | 1 | 1 | 1 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| Mod. Language (M. L. 101-103, 121-123) | 3 | 3 | 3 |
| Algebra (Math. 106) | 3 | ..... | ..... |
| Plane Trigonometry (Math. 107) | ..... | 3 | ..... |
| Plane Analytic Geometry (Math. 108) | ..... | ..... | 3 |
| Zoology (Zool. 101-102) | 3 | 3 | ..... |
| Botany (Bot. 101) | ..... | ..... | 4 |
| Basic R. O. T. C. Course (M. I. 101) | 1 | 1 | 1 |

| SOPHOMORE YEAR. | | | |
|---|---|---|---|
| Adv. Inorganic Chem. (Phys. Chem. 101-103) | 3 | 3 | 3 |
| Adv. Qualitative Anal. (Gen'l Chem. 104) | 3 | ..... | ..... |
| Quantitative Analysis (Gen. Chem. 105-106) | ..... | 3 | 3 |
| Physics (Phys. 101-103) | 5 | 5 | 5 |
| Mod. Language (M. L. 104-106, 124-126) | 3 | 3 | 3 |
| Plane Analytic Geometry (Math. 109) | 3 | ..... | ..... |
| Calculus (Math. 110) | ..... | 3 | 3 |
| Basic R. O. T. C. Course (M. I. 101) | 1 | 1 | 1 |

| JUNIOR YEAR. | | | |
|---|---|---|---|
| Organic Chemistry (Gen'l Chem. 114-116) | 4 | 4 | 4 |
| Adv. Quantitative Analysis (Gen'l Chem. 117-119) | 4 | 4 | 4 |
| Economic (Econ. 101-103) | 3 | 3 | 3 |
| Bacteriology (Bact. 101-103) | 3 | 3 | 3 |
| Electives in Agriculture | 3 | 3 | 3 |

| SENIOR YEAR. | | | |
|---|---|---|---|
| Physical Chemistry (Phys. Chem. 104-105) | 4 | 4 | ..... |
| Colloid Chemistry (Phys. Chem. 106) | ..... | ..... | 4 |
| Agricultural Chemistry (Ind. Chem. 105-106) | ..... | 5 | 5 |
| Physiological Chemistry (Bio. Chem. 101) | 4 | ..... | ..... |
| Plant Bio. Chemistry (Bio. Chem. 102) | ..... | ..... | 3 |
| English (Eng. 104-106) | 2 | 2 | 2 |
| Electives in Agriculture | 7 | 6 | 3 |

### DESCRIPTION OF COURSES

**Ind. Chem. 101. Agricultural Chemistry.** Four credit hours: three lectures and one laboratory period. The third term. Prerequisites, Gen'l Chem. 101-103, 107-108.

A course including lectures, recitations, and laboratory in the chemistry of air, soils, feeds, fertilizers, plants and animals.

#### For Graduates and Advanced Undergraduates

**Ind. Chem. 102-104. Agricultural Chemical Analysis.** Four credit hours each term: two lectures and two laboratory periods. The year.

Prerequisites, Gen'l Chem. 101-103, 105-106 or 107-108.

Lectures, laboratory work, analysis of soils, fertilizers, plant and animal products.

**Ind. Chem. 105-106. Advanced Agricultural Chemistry.** Five credit hours each term: three lectures and two laboratory periods. The second and third terms. Prerequisites, Gen'l Chem. 101-103 (105-106 or 107-108), 114-116.

A study of special problems in agricultural chemistry.

**Ind Chem. 107-108. Industrial Chemistry.** Five credit hours each term: three lectures and two laboratory periods. The first and second terms. Prerequisites, Gen'l Chem. 101-103, 104-105, 106-108, 114-116.

The study of practical methods employed in the various inorganic and organic chemical industries. Visits are made to ice, fermentation and gas plants, also to fertilizer, glass, coke, iron and steel works. The laboratory work accompanying this course consists of the analysis of industrial products.

## DEPARTMENT OF BIOLOGICAL CHEMISTRY

In arranging the curriculum the Department of Biological Chemistry has borne in mind the many calls for men trained in chemistry with a working knowledge in general biology and the chemistry of foods and nutrition. With proper electives the biochemical curriculum also affords a good foundation for the study of medicine and for those desiring to pursue graduate work in biochemistry or plant physiology.

### BIO-CHEMISTRY.

| FRESHMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Public Speaking (P. S. 101-103) | 1 | 1 | 1 |
| Mod. Language (M. L. 101-103, 121-123) | 3 | 3 | 3 |
| Algebra (Math. 106) | 3 | ..... | ..... |
| Plane Trigonometry (Math. 107) | ..... | 3 | ..... |
| Plane Analytic Geometry (Math. 108) | ..... | ..... | 3 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| Zoology (Zool. 101-102) | 3 | 3 | ..... |
| Botany (Bot. 101) | ..... | ..... | 4 |
| Basic R. O. T. C. Course (M. I. 101) | 1 | 1 | 1 |
| **SOPHOMORE YEAR.** | | | |
| Adv. Inorganic Chem. (Phys. Chem. 101-103) | 3 | 3 | 3 |
| Adv. Qualitative Analysis (Gen'l Chem. 104) | 3 | ..... | ..... |
| Quantitative Analysis (Gen'l Chem. 105-106) | ..... | 3 | 3 |
| Physics (Phys. 101-103) | 5 | 5 | 5 |
| Mod. Language (M. L. 104-106, 124-126) | 3 | 3 | 3 |
| Plane Analytic Geometry (Math. 109) | 3 | ..... | ..... |
| Calculus (Math. 110) | ..... | 3 | 3 |
| Basic R. O. T. C. Course (M. I. 101) | 1 | 1 | 1 |

| JUNIOR YEAR. TERM: | I | II | III |
|---|---|---|---|
| Organic Chemistry (Gen'l Chem. 114-116) | 4 | 4 | 4 |
| Economics (Econ. 101-103) | 3 | 3 | 3 |
| Bacteriology (Bact. 101-102) | 3 | 3 | ..... |
| Plant Physiology (Plant Phys. 101-102) | ..... | 4 | 3 |
| Electives | 7 | 3 | 7 |

SENIOR YEAR.

| | | | |
|---|---|---|---|
| Physical Chemistry (Phys. Chem. 104-105) | 4 | 4 | ..... |
| Colloid Chemistry (Phys. Chem. 106) | ..... | ..... | 4 |
| Physiological Chemistry (Bio. Chem. 101) | 4 | ..... | ..... |
| Plant Bio. Chemistry (Bio. Chem. 102) | ..... | ..... | 3 |
| Agricultural Chemistry (Ind. Chem. 105) | ..... | 5 | ..... |
| English (Eng. 104-106) | 2 | 2 | 2 |
| Elective | 7 | 6 | 8 |

## DESCRIPTION OF COURSES

### For Graduates or Advanced Undergraduates

**Bio-Chem. 101. Physiological Chemistry.** Four credit hours: two lectures and two laboratory periods. First term. Prerequisites, Gen'l Chem. 101-103, 105-106, 114-116.

The course embraces a study of the chemistry of protoplasm and the cell; the nutritive requirements of foods and the chemical composition of foodstuffs; catalysis and enzymes; electrolytes and their action; the chemical and physiological processes of digestion, absorption, secretion, excretion, respiration, metabolism and nutrition in general.

**Bio-Chem. 102. Plant Biochemistry.** Three credit hours: two lectures and one laboratory period. Third term.

An advanced course in biochemistry from the standpoint of plants and plant products. Synthesis and transformations of materials in plants and plant organs and the relation of plant processes to animal food and nutrition are especially emphasized.

## DEPARTMENT OF PHYSICAL CHEMISTRY

The Physical Chemistry courses have been designed to give the students a knowledge of physico-chemical phenomena and methods of treating such phenomena as will be helpful in the study of biological, medical and industrial problems. Some courses are designed for graduate work, and research problems will be assigned to students who are properly qualified.

## DESCRIPTION OF COURSES

**Phys. Chem. 101-103. Inorganic Chemistry.** Three credit hours each term: three lectures. The year. Prerequisites, Gen'l Chem. 101-103.

An anvanced course covering more in detail the subject matter set forth in general chemistry with emphasis on chemical theory and important generalization. Required of all students who have chosen chemistry as major. Text-book Mellor.

**Phys. Chem. 104-105. Elements of Physical Chemistry.** Four credit hours each term: three lectures and one laboratory period. The first and second terms. Prerequisites, Gen'l Chem. 101-106, Math. 105 or 110, Physics 101-103.

Will present those portions of physical chemistry which are necessary to every chemist, student of medicine, bacteriologist, or teacher of chemistry with laboratory practice in thermomentry and temperature regulation; physical constants; molecular weight determinations; velocity of reactions; chemical equilibrium and law of mass action; measurements of conductivity; migration of ions; hydrogen-ion concentration, etc.

### For Graduates and Advanced Undergraduates

**Phys. Chem. 106. Colloidal Chemistry.** Four credit hours: three lectures and one laboratory period. The third term. Prerequisites, Gen'l Chem. 114-116, Phys. Chem. (104-105), Physics 101-103.

The following topics will be discussed: The general constitution of colloid systems; Relations between the physical state and the general properties of colloid systems; General energetics of the dispersoids; Distribution of the colloid state and the concept of colloid chemistry; Mechanical properties of colloid systems.

**Phys. Chem. 107. Electrochemistry.** Four credit hours: three lectures and one laboratory period. The third term. Prerequisites, Phys. Chem. 104-105.

In this course the various factors which govern the action of electrolytes when subject to the action of the electric current and the factors which determined electromative force are taken up.

### For Graduates

**Phys. Chem. 201. Special Colloidal Chemistry.** Two credit hours: two lectures. Prerequisite, Phys. Chem. (106).

Special topics will be taken up with emphasis on the most recent theories and research going on in colloid chemistry at the present time.

**Phys. Chem. 202. Physical Chemistry.** Three credit hours each term: two lectures and one laboratory period. The first and second terms. Prerequisites, Gen'l Chem. 101-103, 106-108, Physics 101-103.

A study of the more advanced theories of physical chemistry with laboratory practice in the more technical physico-chemical measurements.

**Phys. Chem. 203. Thermodynamics.** Two credit hours each term: two lectures. Prerequisites, Gen'l Chem. 101-108, Phys. Chem. 104-105, Math. 101-105, Physics 101-103.

Designed for graduate students who wish an advanced mathematical treatment of chemical phenomena. Mellor's chemical statics and dynamics will be applied to Lewis' system of Physical Chemistry.

**Phys. Chem. 204. Research in Physical Chemistry.**

Physical chemistry problems for investigation will be assigned to graduate students who wish to gain an advanced degree in chemistry.

## DEPARTMENT OF FERTILIZER AND FOOD ANALYSIS AND INSPECTION

Under the jurisdiction of the Department of Fertilizer and Food Analysis and Inspection is conducted the State's inspection work, including sampling, analysis, and the publication of results on fertilizers, stock foods, and agricultural lime.

# THE SCHOOL OF HOME ECONOMICS

Research into the sciences and the development of industries, art, and professions has so changed the philosophy of our educational system that it is now recognized that any educational system must include training of a technical nature. It must encourage the student's natural desire for work of a productive nature with a vital connection between theory and practice. These views have not been generally accepted and the result is noted in the combination of vocational, technical, and scientific work with the general studies to form a new course of study for our young men and women.

The subjects taught in home economics are designed to fit young women to be capable workers and home makers in whatever sphere of life they may enter. The knowledge they gain from these subjects should give them contentment, industry, order, and a womanly feeling of independence and responsibility.

The courses of instruction given are planned to meet the needs of three classes of students: (1) those students who desire a knowledge of the general facts and principles of home economics; (2) those students who wish to make a speciality of home economics for the purpose of teaching the subject in secondary schools and colleges; (3) those who are interested in certain phases of home economics which deal with the work of the dietitian or of institutional manager.

## Organization

For adminstrative purposes and for ease of instruction the School of Home Economics is organized into departments as follows:

1. Department of Foods and Cookery.
2. Department of Textiles and Clothing.
3. Department of Hygiene and Health.
4. Department of Institutional and Home Management.

## Equipment

Besides the usual equipment of classrooms and laboratories for the efficient procedure of the work, the college has recently equipped and furnished a house which is to be used as a practice house where the students will live and conduct the operations of the household for a period of from six to ten weeks during their senior year.

## Requirements for the Degrees

The degree of Bachelor of Science is conferred for the satisfactory completion of four years of prescribed courses.

## Curricula in Home Economics

All students registered in the School of Home Economics take the same work in the freshman year. At the end of the year they may elect to specialize in a particular department or they may withhold the election until after the sophomore year without loss of time.

Those who do not wish to specialize in any particular phase of home economics may elect a curriculum of general home economics best suited to their needs.

### HOME ECONOMICS.

| FRESHMAN YEAR. Term: | I | II | III |
|---|---|---|---|
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Gen'l Chem. and Qualitative Anal. (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| *Garment Construction (Cloth. 101) | 2 | ..... | ..... |
| Drafting and Elementary Dress Design (Cloth. 102) | 4 | ..... | ..... |
| Textiles (Tex. 101) | ..... | 1 | ..... |
| Clothing (Cloth. 103) | ..... | 3 | ..... |
| Composition and Design (Art 101) | ..... | 2 | ..... |
| Foods 101 | ..... | ..... | 6 |
| Physical Education (Phy. Ed. 101-103) | 2 | 2 | 2 |
| Electives | 2–4 | 3 | 3 |
| **SOPHOMORE YEAR.** | | | |
| Organic Chemistry (Gen'l Chem. 112-113) | 3 | 3 | ..... |
| Zoology (Zool. 101-102) | 3 | 3 | ..... |
| Botany (Bot. 101) | ..... | ..... | 4 |
| History | 3 | 3 | 3 |
| Laundering (Tex. 102) | 2 | ..... | ..... |
| Advanced Textiles (Tex. 103) | 1 | ..... | ..... |
| Costume Design (Art 103) | ..... | ..... | 3 |
| Foods 102 | ..... | 4 | 4 |
| Library Science | 1 | ..... | ..... |
| Physical Education | 2 | 2 | 2 |
| Electives | 3 | 3 | 2 |
| **JUNIOR YEAR.** | | | |
| Bacteriology (Bact. 101) | 3 | 3 | ..... |
| Household Administration (H. M. 101-102) | 3 | 3 | ..... |
| Home Management (H. M. 103) | ..... | ..... | 5 |
| Marketing and Buying (H. M. 106) | ..... | 2 | ..... |
| Advanced Dressmaking (Cloth. 104-105) | 2 | ..... | 2 |
| Freehand Prospective (Art 102) | 2 | ..... | ..... |
| Home Architecture and Decoration (Art 105) | ..... | 2 | ..... |
| Electives | 6 | 6 | 8 |
| **SENIOR YEAR.** | | | |
| Physiological Chemistry (Bio-Chem. 101) | 4 | ..... | ..... |
| Nutrition (Foods 105) | ..... | 5 | ..... |
| Dietetics (Foods 106) | ..... | ..... | 5 |
| Child Care and Welfare (H. E. Ed. 109) | ..... | ..... | 2 |
| Drapery and Advanced Technique of Clothing (Cloth. 106) | ..... | ..... | 5 |
| English | 3 | 3 | 3 |
| Seminar in Home Economics (Hours and time to be arranged) | ..... | ..... | ..... |
| Electives | 3 | 10 | 8 |

*Students with high school training in Textile and Clothing presenting satisfactory credentials are not required to take Cloth. 101.

## SUGGESTED ELECTIVES FOR STUDENTS IN THE SCHOOL OF HOME ECONOMICS.

| SUBJECT. Term: | I | II | III |
|---|---|---|---|
| Quantitative Analysis (Gen'l Chem. 105-106) | ..... | 3 | 3 |
| Bacteriology (Bact. 103) | ..... | ..... | 3 |
| Literature | 3 | 3 | 3 |
| Public Speaking | 1 | 1 | 1 |
| Public Speaking | 2 | 2 | 2 |
| Language (French, Spanish, German) | 3 | 3 | 3 |
| Mathematics | 3 | 3 | 3 |
| Political Science | 2 | 2 | 2 |
| Economics | 3 | 3 | 3 |
| General and Applied Psychology (Prin. Ed. 105-106) | ..... | 2 | 2 |
| Educational Sociology | 2 | 2 | ..... |
| Educational Psychology | ..... | 2 | 2 |
| Rural Sociology | ..... | ..... | 2 |
| Educational Guidance | 1 | 1 | 1 |
| Public Education in the U. S. (Ed. 101) | 2 | ..... | ..... |
| Lunchroom Management (H. M. 105-106) | 3 | 3 | ..... |
| Catering (Food 109) | ..... | ..... | 3 |
| Housewifery (H. M. 109) | ..... | ..... | 3 |
| Home Nursing and First Aid (H. M. 107) | ..... | 3 | ..... |
| History of the Family (H. E. Ed. 106-107) | 2 | 2 | ..... |
| Education of Women (H. E. Ed. 108) | ..... | ..... | 2 |
| Tailoring (Cloth. 107) | ..... | 3 | ..... |
| Millinery (Cloth. 108) | ..... | 3 | ..... |
| Historic Ornament and Dress Design (Art 106) | 3 | 3 | ..... |
| Art and Handicraft (Art 104) | 2 | ..... | ..... |
| Mechanical Drawing (Dr. 102) | ..... | 3 | ..... |
| History of Art (Art 107) | ..... | ..... | 3 |
| Music | 2 | 2 | 2 |

### Description of Courses

**Foods 101. Preparation and Service of Foods.** Six credit hours ethree lectures and three laboratory periods.

Preparation and service of meals for a family and larger groups; cost and dietetic values; invividual problems in the manipulation of food materials.

**Foods 102-103. Advanced and Experimental Cookery.** Four credit hours each term: two lectures and two laboratory periods. Prerequisites Foods 101.

Advanced work in cookery in treating cooking in large amounts and various experimental problems to be worked out.

**Foods 104. Nutrition.** Five credit hours: Second term. Prerequisite, Chem. 110-111, 132.

The physiological, chemical, and bacteriological aspects of food.

**Foods 105. Dietetics.** Five credit hours. Third term. Prerequisite, Foods 104.

This course deals with the requirements of the individual in health and disease throughout infancy, childhood, adolescence, adult life, and old age, in the light of the chemistry and physiology of digestion, the

energy value of food, and the nutritive properties of the proteins, fats, carbohydrates and ash constituents. Typical dietaries are planned for each group.

**Foods 106. Catering.** Three credit hours. Third term. Prerequisites, H. M. 104-105.

This course is intended for students who are interested in the problems connected with the management of the rooms and catering establishments.

**Tex. 101. Textiles.** One credit hour: one lecture. Scond term.

This course considers the textile industry from primitive ages to modern times; the important fibres and materials made from them.

**Tex. 102. Laundering.** Two credit hours: two laboratory periods. First term.

Behavior of textile fibers toward various cehmical reagents; physical tests for identification of fibers; bleaching; laundry processes as they affect color, shrinkage, etc.; art and economic considerations in selection and purchase of materials for clothing and household hurnishing.

**Tex. 103. Advanced Textiles.** One credit hour: one laboratory period.

This course deals with textile dyeing. Problems will be worked out that are especially adaptable for home use.

**Cloth. 101. Garment Construction.** Two credit hours: two laboratory periods. First term.

This course includes the making of fundamental stitches, darning and patching; practice in hand and machine sewing applied to simple garments.

**Cloth. 102. Drafting and Elementary Dress Design.** Four credit hours:four laboratory periods. First term.

The first half of the term is devoted to the use of the commercial pattern and the making of a simple woolen skirt. The second half deals with drafting, cutting, fitting and designing of patterns. Emphasis is laid upon the development of designs from a simple foundation pattern. Designs are worked out upon paper patterns and adapted in the construction of a cotton or linen dress.

**Cloth. 103. Dressmaking.** Three credit hours: one lecture and two laboratory periods. Second term. Prerequisite, Cloth 102.

The lecture work is chiefly devoted to clothing economics and the clothing budget. The pattern designed in Cloth 102 is used in the construction of a cotton or linen garment. Special attention is given to the technique involved.

**Cloth. 104-105. Advanced Dressmaking.** Two credit hours each term: two laboratory periods. First and second terms. Prerequisites, Cloth. 102, 103, Art 101, 103.

This course includes remodeling of a dress and problems in wool or silk.

**Cloth. 106. Draping and Advanced Technique of Clothing.** Five credit hours: one lecture and four laboratory periods. First term. Prequisite, Cloth. 105.

This course emphasizes the artistic in lines and decoration; deals with the design and adaption of materials for the individual. It includes practice in cutting, fitting, finishing, and draping of such materials as silks, satin, chiffons and laces.

**Cloth. 107. Tailoring.** Three credit hours: three laboratory periods. Second term. Prerequisite, Cloth. 106.

The technique and methods of construction employed in the making of tailored spits and wraps.

**Cloth. 108. Millinery.** Three credit hours: three laboratory periods. Second term.

A study of the processes and materials used in millinery; designing, making, and trimming hats.

**Art 101. Composition and Design.** Two credit hours: two laboratory periods. Second term.

Practice drawing in charcoal and pencil; space division and space relation; color; color schemes and exercises; original designs in which lines, tones, and colors are put together to produce fine quality.

**Art 102. Freehand Perspective.** Two credit hours: two laboratory periods. First term.

Study of perspective principles with application.

**Art 103. Costume Design.** Three credit hours: one lecture, two laboratory periods.

Appropriate dress, proportion of parts; application of color, harmony, art to design for costume in ink and water color. This history of costume is discussed in the lecture work.

**Art 104. Art and Handicraft.** Two credit hours: one lecture and one laboratory period. First term.

Applied design in embroidery, lace, stencils, as adapted to materials for articles of dress and house furnishing.

**Art. 105. Home Architecture and Decoration.** Two credit hours: one lecture and one laboratory period. First term. Prerequisite, Art 101, 102.

Situation, surroundings, and construction of the house; evolution of the house and home; application of color in home decoration; furnishings from a sanitary and artistlc standpoint; perspective drawing of rooms.

**Art 106. History of Ornament and Design.** Two credit hours. First term.

This course continues the work of Art 103.

**H. M. 101-102. House Administration.** Three credit hours each term. First and second terms. Junior year.

This course deals with the operation and maintenance of the household; its sanitation, plumbing, furnishing, and equipment.

**H. M. 103. Home Management (Practice House).** Five credit hours. Third term. Junior year.

From eight to ten weeks' experience as manager and helper in a household of five students.

**H. M. 104-105. Lunchroom Management.** Three credit hours each term. First and second terms. Prerequisites, Foods 101, 102.

A general course in lunchroom management for those who wish a knowledge of the problem of feeding large numbers.

**H. M. 106. Marketing and Buying.** Two credit hours. Second term.

How to buy foods; qualities and prices; market grades adn related values.

**H. M. 107. Home Nursing and First Aid.** Three credit hours. Second term.

Instruction in domestic emergencies and first aid, and in the simple procedures in the home care of the sick.

# THE GRADUATE SCHOOL

Graduate work is offered to graduates of this or other standard colleges who, in the judgment of the Dean of the Graduate School, are qualified to undertake that work. Each individual case must be determined upon its merits.

The graduate work is offered, under the supervision of the Dean of the Graduate School, by competent members of the various faculties of instruction and research. These constitute the Faculty of the Graduate School.

Work in accredited research laboratories of the U. S. Department of Agriculture and other local national research agencies under competent supervision is accepted, when previously arranged, as work in residence for part of the requirement. These laboratories are located in easy daily reach of the University.

## Advanced Degrees

The advanced degrees conferred are Master of Science and Doctor of Philosophy for work in Agriculture and the natural sciences; Master of Arts for work in Liberal Arts, Education and Home Economics, and Doctor of Philosophy in Liberal Arts.

## Master of Science and Master of Arts

The degree of Master of Science, or Master of Arts, will be conferred upon resident graduates who meet the following requirements:

1. The candidate must be a graduate of a qualified institution and must have the necessary prerequisites for the field of advanced work chosen.

2. He must complete a course of approved graduate study with one major and one closely related minor subject, working on a full-time basis of one year of advanced work. The work may, when approved, be extended on a part-time basis over a longer period.

3. The candidate must submit a thesis approved by the Graduate Faculty.

4. The candidate must pass a satisfactory examination.

## Doctor of Philosophy

1. As prerequisites to registration for the Doctor's degree, the candidate must be a graduate of a standard college, must have a reading knowledge of French or German, and the necessary basic training in the field in which he proposes to take advanced work.

2. Three years of graduate study will usually be required. At least one year must be in residence. The importance and quality of the work, as well as the time element, will be considered. On a part-time basis the time needed will be correspondingly increased. The work must be intersive research, resulting in an important contribution.

3. The candidate must select a major and one or two closely related minor subjects, constituting a single field of research.

4. The candidate must present a thesis within the field of research selected. This must be in the hands of the Dean of the Graduate School in printed or typewritten form at least two weeks before the time at which degrees are granted.

5. The candidate must pass a final examination in the major and minor subjects. The examination will be given by a committee appointed by the Dean.

### Advanced Professional Degrees in Engineering

The degrees of Civil Engineer, Electrical Engineer or Mechanical Engineer will be granted only to graduates of this College who have obtained a bachelor's degree in engineering. The applicant must satisfy the following conditions:

1. He shall have been engaged successfully in acceptable engineering work for three years.

2. His registration for a degree must be approved at least 12 months prior to the date at which the degree is sought. He shall present with his application a complete report of his engineering experience and an outline of his proposes thesis.

3. He shall present a satisfactory thesis on an approved subject.

4. He must be considered eligible by a committee composed of the Dean of the School and the heads of the Departments of Civil, Electrical and Mechanical Engineering.

# DEPARTMENT OF MILITARY SCIENCE AND TACTICS

## Reserve Officers' Training Corps

The work in this department is based upon the provisions of Special Regulations No. 44, War Department, 1919.

**Authorization.** An infantry unit of the Senior Division of the Reserve Officers' Training Corps has been established at the University under the provisions of the Act of Congress of June 3, 1916, as amended by the acts of June 3, 1916, and September 8, 1916.

**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 as reserve officers in the military forces of the United States. It is intended to attain this object during the time that students are pursuing their general or professional studies with the least practicable interference with their civil careers, by employing method designed to fit men, physically, mentally and morally for pursuits of peace as well as pursuits of war. It is believed that such military training will aid greatly in the development of better citizens.

**Required to Take Instruction.** All male students, if citizens of the United States whose bodily condition indicate that they are physically fit to perform military duty or will be upon arrival at military age, whether pursuing a four-year or a two-year course of study, are required to take for a period of two years, as a prerequisite to graduation, the military training required by the War Department.

**Credit Given.** These students who have completed satisfactorily, the prescribed training with a unit of the S. A. T. C. may be credited with one year of the Basic Course prescribed for the R. O. T. C., and those students who have received military training at an educational institution under the direction of an army officer detailed as professor of military science and tactics may receive credit for instruction equivalent to that given in the senior division R. O. T. C.

**Time Allotted.** For first and second year, basic course, three periods a week of not less than one hour each are devoted to this work, of which at least one hour is utilized for theoretical instruction.

For third and fourth years, advanced courses, elective, five periods a week of not less than one hour each are devoted to this work, of which at least three periods are dutilized for theoretical instruction.

**Physical Training.** Physical training forms an important part in military instruction, and it is the policy of the Miliary Department to encourage and support the physical training given by civilian teachers, thus cooperating in an effort to promote a vigorous manhood.

**Physical Examination.** All members of the Reserve Officers Training Corps are required to be examined physically at least once after entering the University.

**Uniforms.** Members of the Reserve Officers' Training Corps must appear in proper uniforms at all military formations and at other specified times.

Uniforms for the Reserve Officers' Training Corps will be furnished free by the Government. The uniforms are the regulation uniform of the United States Army, with certain distinguishing features. Such uniforms must be kept in good condition by the student. They are the property of the Government and though intended primarily for use in connection with military instruction may be worn at any other time unless the regulations governing their use are violated. The uniform cannot be worn in part. Uniforms will be returned to the Military Department at the end of the year, and before if the student leaves the University.

**Commutation.** Those students who elect the advanced courses and who have signed the contract with the Government to continue in the Reserve Officers' Training Corps for the two remaining years of the advanced course are entitled to commutation of subsistence from and including the date of contract until they complete the course at the institution.

**Summer Camps.** An important and excellent feature of the Reserve Officers' Training Corps is the summer camp. In specially selected parts of the country camps are held for a period not exceeding six weeks for students who are members of the Reserve Officers' Training Corps. These camps are under the strict supervision of army officers and are intended primarily to give a thorough and comprehensive practical course of instruction in the different arms of the service. Parents may feel assured that their sons are carefully watched and safeguarded. Wholesome surroundings and associates, work and healthy recreation are the key-note to contentment. Social life is not neglected and the morale branch exercises strict censorship over all social functions.

The attendance at summer camps is compulsory only for those students who are taking the advanced course.

**Commissions.** (a) Each year upon completion of the Advanced Course, students qualified for commissions in the Reserve Officers' Corps

will be selected by the heads of the institution and the professor of Military Science and Tactics.

(b) The number to be selected from each institution and for each arm of the service will be determined by the War Department.

**Credits.** Military instruction at this University is on a par with other university work and the requirements of this department are proficiency the same as with other departments.

### Basic Course, M. I.

First year (generally given to freshmen and the first-year students in the two-year course). Two credits per term.

Second year (generally given to sophomores and the second-year students in the two-year course. Two credits per term.

### Advanced Course, M. I. (elective)

Third year (generally given to juniors). Three credits per term,
Fourth year (generally given to seniors). Three credits per term.

### Description of Courses

**M. I. 101. Basic R. O. T. C..** Two credit hours each term. Freshman year.

The following subjects will be covered:

#### First Term

Physical Training, Manual of Physical Training (Practical).
Infantry Drill Regulations (Practical and Theoretical).
School of Squad, inclusive.
Small Arms Firing; Collective Firing, inclusive (Practical and Theoretical).
Military Courtesy, Customs of the Service.
Care and Handling of Equipment (Practical and Theoretical).
Lectures. Personal Hygiene.
Examination at end of term.

#### Second Term

Physical Training, Manual of Physical Training (Practical).
Infantry Drill Regulations to include the platoon (Practical and Theoretical).
Small Arms Firing.
Map Reading. Military Sketching (Theoretical).
Minor Tactics, Infantry, Map Problems (Practical and Theoretical).
Examination at end of term.

THIRD TERM

Physical Training, Manual of Physical Training (Practical).
Infantry Drill Regulations, Company and Battalion Drill (Practical).
Service of Security and Information (Practical and Theoretical).
Camp Hygiene. Infantry Map Problems (Practical and Theoretical).
Lecture to cover other subjects. Examination at end of term.

**M. I. 102. Basic R. O. T. C.** Two credit hours each term. Sophomore year.

The following subjects will be taught:

FIRST TERM

Physical Training, Manual of Physical Training (Practical).
Infantry Drill Regulations; School, of the Squad, inclusive (Practical and Theoretical).
Theory of Target Practice (Practical and Theoretical).
Military Courtesy and Discipline (Practical and Theoretical).
Minor Tactics. Map Problems.
Personal Hygiene. Lectures on other subjects.
Examination at end of term.

SECOND TERM

Physical Training, Manual of Physical Training (Practical).
Infantry Drill Regulations, Drill with Battalion (Practical).
Camp Sanitation (Theoretical).
Trench and Open Warfare (Theoretical).
Military Engineering (Practical and Theoretical).
Topography (Practical and Theoretical).
Small Arms Firing (Theoretical).
Lecture to cover other subjects. Examination at end of term.

THIRD TERM

Physical Training, Manual of Physical Training (Practical).
Infantry Drill Regulations (Practical).
Minor Tactics. Map Problems. Topography (Theor. and Practical).
Same for all Arms (Practical and Theoretical).
Lecture to cover other subjects. Examination at end of term.

**M. I. 103. Advanced R. O. T. C.** Three credit hours each term. Junior year.

The following subjects will be covered:

FIRST TERM

Physical Training (Practical). Infantry Drill Regulations, Drill with Battalion.
Use of Infantry Arm in War. Special Arms, Machine Guns, Automatic Rifles, Trench Mortars (Theoretical and Practical).

Military Drawing (Practical). Minor Tactics. B/H Relief Map.
Hygiene, 1st Aid and Sanitation (Theoretical).
Military Courtesy and Discipline (Theoretical and Practical).
Lectures on other subjects. Examination at end of term.

SECOND TERM

Physical Training. Minor Tactics. B/H Relief Map (Practical and Theoretical).
Design of Military Structures (Practical and Theoretical).
Equipment (Prac. and Theor.). Field Engineering (Theoretical).
Lectures on other subjects. Examination at end of term.

THIRD TERM

Physical Training. Infantry Drill Regulations. Drill with Battalion (Practical). Minor Tactics.
Map and Terrain Problems (Prac.). Topography (Prac. and Theor.).
Law, Common and Military (Theor). Military Policy (Theor.).
Lectures on other subjects. Examination at end of term.

**M. I. 104. Advanced R. O. T. C.** Three credit hours per term. Senior year.

The following subjects will be covered:

FIRST TERM

Physical Training. Infantry Drill Regulations.
Drill with Battolion. The War Game on B/H Relief Map.
Administration. Army Paper Work (Theoretical).
Personal Hygiene, 1st Aid and Sanitation (Theor.). Minor Tactics.
Lectures on other subjects. Examination at end of term.

SECOND TERM

Physical Training (Practical). Hippology (Theoretical).
Military Law (Theoretical). The War Game on B/H Relief Map.
Musketry (Theoretical and Practical).
Topography and Map Reading (Theoretical and Practical).
Minor Tactics (Practical).
Lectures on other subjects. Examination at end of term.

THIRD TERM

Physical Training (Practical). Infantry Drill Regulations.
Drill with the Battalion. Military Policy of the United States.
Military History to include the Study of War with Germany (Theor.).
Minor Tactics. Terrain and Map Problems (Theor. and Prac.).
Lectures on other subjects. Examination at end of term.

## ELECTIVE COURSES

| TERM: | I | II | III |
|---|---|---|---|
| **SCHOOL OF AGRICULTURE** | | | |
| HORTICULTURE: | | | |
| Elementary Pomology (Hort. 101) | 4 | ..... | ..... |
| Commercial Fruit Growing (Hort. 102-103) | 3 | ..... | ..... |
| Systematic Pomology (Hort. 104) | 3 | ..... | ..... |
| Advanced Practical Pomology (Hort. 105) | 1 | ..... | ..... |
| Small Fruit Culture (Hort. 106) | ..... | ..... | 3 |
| Economic Fruits of the World (Hort. 107) | ..... | 3 | ..... |
| Fruit and Vegetable Judging (Hort. 108) | 2 | ..... | ..... |
| Advanced Fruit Judging (Hort. 109) | 1 | ..... | ..... |
| Elementary Vegetable Gardening (Hort. 111) | ..... | ..... | 4 |
| Tuber and Root Crops (Hort. 112) | 3 | ..... | ..... |
| Commercial Vegetable Gardening (Hort. 113-115) | 3 | 3 | 3 |
| Systematic Olericulture (Hort. 116) | 3 | ..... | ..... |
| Advanced Vegetable Gardening (Hort. 117) | ..... | ..... | 1 |
| Vegetable Forcing (Hort. 118) | ..... | 3 | ..... |
| Elementary Floriculture (Hort. 121) | ..... | 3 | ..... |
| Greenhouse Management (Hort. 122-123) | 3 | 2 | ..... |
| Floriculture Practice (Hort. 124) | ..... | ..... | 1 |
| Greenhouse Construction (Hort. 125) | ..... | 2 | ..... |
| Commercial Floriculture (Hort. 126-127) | 3 | 3 | ..... |
| Garden Flowers (Hort. 128) | ..... | ..... | 3 |
| Amateur Floriculture (Hort. 129) | ..... | ..... | 3 |
| General Landscape Gardening (Hort. 131) | ..... | ..... | 3 |
| Plant Materials (Hort. 132) | 2 | ..... | ..... |
| Plant Materials (Hort. 133) | ..... | ..... | 2 |
| Elements of Landscape Design (Hort. 134) | ..... | 2 | ..... |
| Landscape Design (Hort. 135-136) | 3 | 3 | ..... |
| Landscape Practice (Hort. 137) | ..... | ..... | 3 |
| History of Landscape Gardening (Hort. 138) | ..... | 1 | ..... |
| Civic Art (Hort. 139) | 2 | ..... | ..... |
| Horticultural Breeding Practice (Hort. 142) | ..... | ..... | 1 |
| Horticultural Research and Thesis (Hort. 143-145) | 3 | 3 | 3 |
| Horticultural Seminar (Hort. 146-148) | 1 | 1 | 1 |
| AGRONOMY: | | | |
| Cereal Crops (Agron. 101) | 4 | ..... | ..... |
| Grain Judging (Agron. 102) | ..... | 1 | ..... |
| Forage Crops (Agron. 103) | ..... | ..... | 4 |
| Crop Breeding (Agron. 104) | ..... | ..... | 3 |
| Methods in Crop Investigations (Agron. 105) | 3 | ..... | ..... |
| Grading Farm Crops (Agron. 106) | ..... | 3 | ..... |
| Genetics (Agron. 107) | ..... | 4 | ..... |
| Crop Rotation (Agron. 108) | ..... | 2 | ..... |
| Seminar (Agron. 109) | ..... | 1 | ..... |
| Research and Thesis (Agron. 110) | ..... | ..... | ..... |
| BOTANICAL GROUP: | | | |
| General Botany (Bot. 101) | ..... | ..... | 4 |
| Plant Anatomy (Morph. and Myc. 101) | 3 | ..... | ..... |
| Systematic Botany (Morph. and Myc. 102) | ..... | ..... | 3 |
| Plant Morphology (Morph. and Myc. 103-105) | 4 | 4 | 4 |
| Mycology (Morph. and Myc. 106) | ..... | ..... | 3 |
| Methods in Plant Histology (Morph. and Myc. 107) | ..... | 3 | ..... |
| Cytology (Morph. and Myc. 108) | ..... | 3 | ..... |
| Advanced Taxonomy (Morph. and Myc. 109) | 3 | ..... | ..... |
| Plant Physiology (Plt. Phy. 101-102) | ..... | 4 | 3 |
| Plant Ecology (Plt. Phy. 103) | ..... | ..... | 3 |
| Advanced Plant Physiology (Plt. Phy. 104-106) | 4 | 4 | 4 |

## ELECTIVE COURSES—Continued

| TERM: | I | II | III |
|---|---|---|---|
| **SCHOOL OF AGRICULTURE**—Continued | | | |
| BOTANICAL GROUP—Continued | | | |
| Plant Micro-Chemistry (Plt. Phy. 107) | ..... | 3 | ..... |
| General Plant Pathology (Plt. Path. 101) | 3 | ..... | ..... |
| Methods in Plant Pathology (Plt. Pth. 102-104) | 3 | 3 | 3 |
| Advanced Plant Pathology (Plt. Path. 105-107) | 4 | 4 | 4 |
| Seminar in Pathology (Plt. Path. 108-110) | 1 | 1 | 1 |
| FORESTRY: | | | |
| Farm Forestry (For. 101) | ..... | ..... | 3 |
| ANIMAL INDUSTRY: | | | |
| Animal Husbandry (A. H. 101) | ..... | 4 | ..... |
| Feeds and Feeding (A. H. 102) | 4 | ..... | ..... |
| Management of Dairy Young Stock (A. H. 103) | ..... | ..... | 3 |
| Principles of Breeding (A. H. 104) | ..... | 4 | ..... |
| Swine Production (A. H. 105) | 3 | ..... | ..... |
| Meat and Meat Products (A. H. 106) | ..... | 3 | ..... |
| Beef Production (A. H. 107) | ..... | 3 | ..... |
| Sheep Production (A. H. 108) | ..... | ..... | 3 |
| Horse and Mule Production (A. H. 109) | 3 | ..... | ..... |
| Advanced Judging (A. H. 110-111) | ..... | 2 | 2 |
| Advanced Breed Study (A. H. 112) | ..... | ..... | 3 |
| Animal Genetics and Statistical Methods (A. H. 113) | 4 | ..... | ..... |
| Markets and Marketing (A. H. 114) | ..... | 3 | ..... |
| Nutrition (A. H. 115) | ..... | ..... | 2 |
| Seminar (A. H. 116) | ..... | 1 | ..... |
| Research and Thesis (A. H. 117-119) | 2 | 2 | 2 |
| Farm Poultry (P. H. 101) | ..... | ..... | 4 |
| Principles of Dairying (D. H. 101) | 3 | ..... | ..... |
| Dairy Production and Barn Practice (D. H. 102) | ..... | 3 | ..... |
| History and Development of Dairy Cattle (D. H. 103) | ..... | ..... | 2 |
| Farm Dairying (D. H. 104) | 3 | ..... | ..... |
| Commercial Dairy Products (D. H. 106) | ..... | 3 | ..... |
| Judging Dairy Products (D. H. 106) | ..... | ..... | 2 |
| Market Milk (D. H. 107) | 3 | ..... | ..... |
| Advanced Course in Milk Testing (D. H. 108) | ..... | 3 | ..... |
| Seminar (D. H. 109) | ..... | 1 | ..... |
| Research and Thesis (D. H. 110-112) | 2 | 2 | 2 |
| General Bacteriology (Bact. 101-103 | 3 | 3 | 3 |
| Special Bacteriology for Home Economics Students (Bact. 103-A) | ..... | ..... | 3 |
| Dairy Bacteriology (Bact. 104-106) | 3 | 3 | 3 |
| Advanced Bacteriology (Bact. 107-109) | 2 | 2 | 2 |
| Thesis (Bact. 110-112) | 2 | 2 | 2 |
| Seminar (Bact. 113-114) | 1 | 1 | 1 |
| Anatomy and Physiology (V. M. 101) | 3 | ..... | ..... |
| Animal Diseases (V. M. 102) | ..... | 4 | ..... |
| SOILS: | | | |
| General Geology (Geol. 101) | 3 | ..... | ..... |
| Soil Physics and Management (Soils 101-102) | ..... | 3 | 3 |
| Soil Fertility and Fertilizers (Soils 103-105) | 3 | 3 | 3 |
| Soil Surveying and Classification (Soils 106) | 3 | ..... | ..... |
| Soil Bacteriology (Soils 107) | ..... | ..... | 4 |
| Thesis (Soils 108-110) | 2 | 2 | 2 |
| Soil Technology (Soils 111-113) | 3 | 3 | 3 |
| Methods of Soil Investigation (Soils 114) | ..... | ..... | 2 |
| Seminar (Soils 115-116) | ..... | 1 | 1 |

## ELECTIVE COURSES—Continued

| TERM: | I | II | III |
|---|---|---|---|
| **SCHOOL OF AGRICULTURE**—Continued | | | |
| FARM MANAGEMENT: | | | |
| Farm Management (F. M. 101-102) | 3 | 3 | ..... |
| Studies in Agricultural Economics (A. E. 101) | ..... | ..... | 3 |
| Markets and Marketing (A. E. 102) | ..... | 3 | ..... |
| Cooperative Marketing (A. E. 103) | ..... | ..... | 3 |
| Farm Accounting (A. E. 104) | 4 | ..... | ..... |
| Elements of Community Study (R. O. 101-103) | 3 | 3 | 3 |
| Principles of Rural Organization (R. O. 104) | 3 | ..... | ..... |
| ZOOLOGY: | | | |
| General Zoology (Zool. 101-102) | 3 | 3 | ..... |
| Mammalian Anatomy (Zool. 102-A) | ..... | ..... | 1 |
| Normal Histology (Zool. 103) | 4 | ..... | ..... |
| Embryology (Zool. 104-105) | ..... | 4 | 4 |
| Comparative Morphology of Vertebrates (Zool. 106) | ..... | ..... | 3 |
| Entomology (Zool. 107) | ..... | ..... | 3 |
| Insect Morphology (Zool. 108) | 2 | ..... | ..... |
| Economic Entomology (Zool. 109-110) | ..... | 4 | 4 |
| Economic Entomology (Zool. 111-113) | 5 | 5 | 5 |
| Systematic Entomology (Zool. 114) | 2 | ..... | ..... |
| Thesis (Zool. 115-117) | 2 | 2 | 2 |
| Insecticides and Their Application (Zool. 118) | ..... | 2 | ..... |
| Medical Zoology (Zool. 119) | 3 | ..... | ..... |
| Scientific Delineation and Preparations (Zool. 120-121) | 1 | 1 | ..... |
| Horticultural Entomology (Zool. 122) | ..... | ..... | 3 |
| Seminar (Zool. 123-125) | 1 | 1 | 1 |
| Introduction to Aquiculture (Zool. 126) | ..... | ..... | ..... |
| **SCHOOL OF CHEMISTRY** | | | |
| GENERAL CHEMISTRY: | | | |
| General Chemistry and Qualitative Analysis (Gen'l Chem. 101-103) | 4 | 4 | 4 |
| Advanced Qualitative Analysis (Gen'l Chem. 104) | 3 | ..... | ..... |
| Quantitative Analysis (Gen'l Chem. 105-106) | ..... | 3 | 3 |
| Quantitative Analysis (Gen'l Chem. 107-108) | 3 | 3 | ..... |
| Technical Analysis (Gen'l Chem. 109) | ..... | 2 | ..... |
| Determinative Mineralogy and Assaying (Gen'l Chem. 110) | ..... | ..... | 3 |
| Metallurgical Calculations (Gen'l Chem. 111) | ..... | 2 | ..... |
| Organic Chemistry (Gen'l Chem. 112-113) | 3 | 3 | ..... |
| Advanced Organic Chemistry (Gen'l Chem. 114-116) | 4 | 4 | 4 |
| Advanced Quantitative Analysis (Gen'l Chem. 117-119) | 4 | 4 | 4 |
| INDUSTRIAL CHEMISTRY: | | | |
| Agricultural Chemistry (Ind. Chem. 101) | ..... | ..... | 4 |
| Agricultural Chemical Analysis (Ind. Chem. 102-104) | 4 | 4 | 4 |
| Advanced Agricultural Chemistry (Ind. Chem. 105-106) | 5 | 5 | 5 |
| Industrial Chemistry (Ind. Chem. 107-108) | 5 | 5 | ..... |
| BIOLOGICAL CHEMISTRY: | | | |
| Physiological Chemistry (Bio-Chem. 101) | 4 | ..... | ..... |
| Plant Biochemistry (Bio-Chem. 102) | ..... | ..... | 3 |
| PHYSICAL CHEMISTRY: | | | |
| Inorganic Chemistry (Phys. Chem. 101-103) | 3 | 3 | 3 |
| Elements of Physical Chemistry (Phys. Chem. 104-105) | 4 | 4 | ..... |
| Colloidal Chemistry (Phys. Chem. 106) | ..... | ..... | 4 |
| Electrochemistry (Phys. Chem. 107) | ..... | ..... | 4 |

## ELECTIVE COURSES—Continued

| TERM: | I | II | III |
|---|---|---|---|
| **SCHOOL OF EDUCATION** | | | |
| EDUCATION: | | | |
| Public Education in the United States (Ed. 101) | 2 | ..... | ..... |
| Educational Psychology (Ed. 102) | 5 | ..... | ..... |
| Survey of Teaching Methods (Ed. 103) | ..... | 5 | ..... |
| Methods in Secondary English, History and the Languages (Ed. 104) | ..... | ..... | 5 |
| Methods in the Secondary School Sciences (Ed. 105) | ..... | ..... | 5 |
| Supervised Teaching of General Subjects (Ed. 106) | 5 or | 5 or | 5 |
| Principles of Secondary Education (Ed. 107) | 3 | ..... | ..... |
| Theory of Vocational Education (Ed. 108) | ..... | ..... | 3 |
| EDUCATIONAL GUIDANCE: | | | |
| Educational Guidance (Ed. Guid. 101-103) | 1 | 1 | 1 |
| PSYCHOLOGY: | | | |
| General and Applied Psychology (Psy. 101-102) | ..... | 2 | 2 |
| AGRICULTURAL EDUCATION: | | | |
| Methods in Secondary Vocational Agric. (Ag. Ed. 101) | ..... | ..... | 5 |
| Problems in Agricultural Education (Ag. Ed. 102-104) | 1 | 1 | 1 |
| Supervised Teaching of Agriculture (Ag. Ed. 105) | ..... | 5 | ..... |
| The Rural Community and Its Education (Ag. Ed. 106) | ..... | 3 | ..... |
| Methods in Agricultural Extension (Ag. Ed. 107) | ..... | ..... | 2 |
| Agricultural Extension Practice (Ag. Ed. 108) | 2 or | 2 or | 2 |
| HOME ECONOMICS EDUCATION: | | | |
| Methods in Secondary Vocational Home Economics (H. E. Ed. 101) | ..... | ..... | 5 |
| Problems in Home Economics Education (H. E. Ed. 102-104) | 1 | 1 | 1 |
| Supervised Teaching of Home Economics (H. E. Ed. 105) | ..... | 5 | ..... |
| History of the Family (H. E. Ed. 106-107) | 2 | 2 | ..... |
| Education of Women (H. E. Ed. 108) | ..... | ..... | 2 |
| Child Care and Welfare (H. E. Ed. 108) | ..... | ..... | 2 |
| Methods of Home Economics Extension Work (H. E. Ed. 110) | ..... | ..... | 2 |
| INDUSTRIAL EDUCATION: | | | |
| Methods in Industrial Education for Secondary Schools (Ind. Ed. 101) | ..... | ..... | 5 |
| Problems in Industrial Education (Ind. Ed. 102) | 2 | 2 | 2 |
| Supervised Teaching of Industrial Subjects (Ind. Ed. 105) | ..... | 5 | ..... |
| History of Industrial Education (Ind. Ed. 106) | ..... | 3 | ..... |
| **SCHOOL OF ENGINEERING AND MECHANIC ARTS** | | | |
| DRAWING AND DESCRIPTIVE GEOMETRY: | | | |
| Freehand Drawing (Dr. 101) | 1 | ..... | ..... |
| Mechanical Drawing (Dr. 102) | 1 | 1 | ..... |
| Mechanical Drawing (Dr. 103) | 2 | 1 | ..... |
| Engineering Drawing (Dr. 104) | ..... | 1 | ..... |
| Descriptive Geometry (Dr. 105) | ..... | ..... | 3 |
| Descriptive Geometry (Dr. 106) | 4 | ..... | ..... |
| Mechanical Drawing (Dr. 107) | 1 | ..... | ..... |
| Drafting (Dr. 108) | ..... | ..... | 1 |
| Shades, Shadows, Perspective (Dr. 109) | 2 | 2 | ..... |

## ELECTIVE COURSES—Continued

| TERM: | I | II | III |
|---|---|---|---|
| **SCHOOL OF ENGINEERING AND MECHANIC ARTS**—Continued | | | |
| ELECTRICAL ENGINEERING: | | | |
| Elementary Electricity (E. E. 101) | ..... | 2 | 2 |
| Direct Current Theory (E. E. 102) | 3 | 3 | ..... |
| Dynamos and Alternating Currents (E. E. 103) | ..... | ..... | 3 |
| Alternating Currents and Alternating Current Machinery (E. E. 104) | 3 | 3 | 3 |
| Lighting and Illumination (E. E. 105) | ..... | ..... | 3 |
| Electric Power Plants and Transmission (E. E. 106) | ..... | 3 | ..... |
| Telephones and Telegraphs (E. E. 107) | ..... | 2 | ..... |
| Wireless Telegraphy (E. E. 108) | ..... | 1 | ..... |
| Electric Railways (E. E. 109) | ..... | ..... | 3 |
| Primary and Secondary Batteries (E. E. 110) | ..... | 2 | ..... |
| Dynamo Electric Machinery (E. E. 111) | ..... | ..... | ..... |
| Dynamo Electric Machinery (E. E. 112) | | 2 | ..... |
| ELECTRICAL ENGINEERING DESIGN: | ..... | | |
| Direct Current Design (E. Des. 101) | 1 | ..... | 5 |
| Alternating Current Design (E. Des. 102) | | ..... | ..... |
| ELECTRICAL ENGINEERING LABORATORY: | | | |
| Electrical Engineering Laboratory (El. Lab. 101) | ..... | 1 | 1 |
| Electrical Engineering Laboratory (El Lab. 102) | 1 | ..... | ..... |
| Electrical Engineering Laboratory (El. Lab. 103) | ..... | 1 | ..... |
| Electrical Engineering Laboratory (El. Lab. 104) | 2 | 1 | 2 |
| Electrical Engineering Laboratory (El. Lab. 105) | 2 | 2 | 2 |
| Telephone Laboratory (El. Lab. 106) | ..... | 1 | ..... |
| Wireless Laboratory (El. Lab. 107) | ..... | 1 | ..... |
| EXPERIMENTAL LABORATORY: | | | |
| Testing (Exp. Lab. 101) | ..... | 1 | ..... |
| Experimental Engineering (Exp. Lab. 102) | ..... | ..... | 1 |
| Cement Testing (Exp. Lab. 103) | 1 | ..... | 1 |
| Experimental Engineering (Exp. Lab. 104) | 1 | 2 | ..... |
| HIGHWAY ENGINEERING: | | | |
| Highways (Hwys. 101) | 2 | ..... | ..... |
| Highway Engineering (Hwys. 102) | ..... | 3 | 4 |
| Materials Laboratory (Hwys. 103) | ..... | ..... | 1 |
| HYDRAULIC AND SANITARY ENGINEERING: | | | |
| Hydraulics (Hyd. 101) | ..... | ..... | 3 |
| Hydraulics (Hyd. 102) | 1 | ..... | ..... |
| Hydromechanics (Hyd. 103) | 3 | ..... | ..... |
| Elements of Sanitary Engineering (Hyd. 104) | 3 | ..... | ..... |
| Water Supply (Hyd. 105) | ..... | 3 | ..... |
| Sewerage (Hyd. 106) | ..... | ..... | 4 |
| Hydraulic Design (Hyd. 107) | ..... | ..... | 1 |
| Drainage (Hyd. 108) | ..... | ..... | 1 |
| Drainage (Hyd. 109) | ..... | ..... | 1 |
| Advanced Drainage (Hyd. 110) | ..... | ..... | 2 |
| MACHINE DESIGN: | | | |
| Elementary Machine Design (M. Des. 101) | 2 | ..... | ..... |
| Machine Design (M. Des. 102) | ..... | 3 | ..... |
| Machine Design (M. Des. 103) | ..... | ..... | 4 |
| Kinematics of Machinery (M. Des. 104) | ..... | ..... | 3 |
| Design of Farm Machinery (M. Des. 105) | ..... | 3 | 3 |
| MATHEMATICS: | | | |
| Trigonometry (Math. 101) | 5 | ..... | ..... |
| Solid Geometry and Spherical Trigonometry (Math. 102) | 5 | ..... | ..... |
| Analytic Geometry (Math. 103) | ..... | 5 | 5 |

## ELECTIVE COURSES—Continued

| TERM: | I | II | III |
|---|---|---|---|
| **SCHOOL OF ENGINEERING AND MECHANIC ARTS**—Continued | | | |
| MATHEMATICS—Continued | | | |
| Advanced Algebra (Math. 104) | 3 | ..... | ..... |
| Calculus (Math. 105) | 2 | 5 | 5 |
| Algebra (Math. 106) | 3 | ..... | ..... |
| Plane Trigonometry (Math. 107) | ..... | 3 | ..... |
| Plane Analytic Geometry (Math. 108) | ..... | ..... | 3 |
| Plane Analytic Geometry (Math. 109) | 3 | ..... | ..... |
| Calculus (Math. 110) | ..... | 3 | 3 |
| Solid Geometry (Math. 111) | ..... | ..... | 3 |
| Differential Equations (Math. 112) | ..... | 3 | ..... |
| Least Squares (Math. 113) | ..... | ..... | 2 |
| Estimates and Costs (Math. 114) | 1 | ..... | ..... |
| Astronomy (Math. 115) | ..... | 3 | ..... |
| MECHANICAL ENGINEERING: | | | |
| Technical Instruction (M. E. 101) | 1 | 1 | ..... |
| Steam Engines, Boilers and Dynamos (M. E. 102) | 3 | ..... | ..... |
| Technical Mechanics (M. E. 103) | ..... | 2 | ..... |
| Heat Engineering (M. E. 104) | 2 | ..... | ..... |
| Heat Engineering (M. E. 105) | ..... | 3 | 3 |
| Heating and Ventilation (M. E. 106) | ..... | ..... | 3 |
| Marine Engineering (M. E. 107) | ..... | ..... | 2 |
| Steam Turbine Engineering (M. E. 108) | ..... | ..... | 2 |
| Gas Engines (M. E. 109) | ..... | ..... | 4 |
| MECHANICS AND MATERIALS OF CONSTRUCTION: | | | |
| Graphic Statics (Mech. 101) | ..... | 3 | ..... |
| Analytical Mechanics (Mech. 102) | ..... | | 3 |
| Mechanics of Engineering (Mech. 103) | 5 | ..... | ..... |
| Mechanics of Engineering (Mech. 104) | ..... | 2 | 2 |
| Materials of Construction (Mech. 105) | ..... | 2 | ..... |
| PHYSICS: | | | |
| Mechanics and Sound (Phys. 101) | 4 | ..... | ..... |
| Electricity and Magnetism (Phys. 102) | ..... | 4 | ..... |
| Heat and Light (Phys. 103) | ..... | ..... | 4 |
| General Physics (Phys. 104) | 2 | 2 | 2 |
| PHYSICS LABORATORY: | | | |
| Mechanics and Sound (Phys. Lab. 101) | 1 | ..... | ..... |
| Electricity and Magnetism (Phys. Lab. 102) | ..... | 1 | ..... |
| Heat and Light (Phys. Lab. 103) | ..... | ..... | 1 |
| General Physics (Phys. Lab. 104) | 1 | 1 | 1 |
| RAILWAY ENGINEERING: | | | |
| Railway Curves (Rwys. 101) | ..... | 3 | ..... |
| Railway Earthwork (Rwys. 102) | ..... | ..... | 2 |
| Railway Surveying (Rwys. 103) | ..... | ..... | 2 |
| Railway Economics (Rwys. 104) | ..... | 3 | ..... |
| SHOP PRACTICE: | | | |
| Woodwork (Shop 101) | 1 | 2 | 1 |
| Woodwork (Shop 102) | 1 | 1 | ..... |
| Woodwork (Shop 103) | 1 | ..... | ..... |
| Woodwork (Shop 104) | ..... | 1 | ..... |
| Blacksmithing (Shop 105) | ..... | 2 | ..... |
| Blacksmithing (Shop 106) | ..... | 1 | ..... |
| Forging and Pipe-fitting (Shop 107) | ..... | ..... | 1 |
| Foundry Work (Shop 108) | ..... | ..... | 2 |
| Machine Work (Shop 109) | 1 | 1 | 1 |
| Machine Work (Shop 110) | 3 | 2 | ..... |
| Machine Work (Shop 111) | 1 | 1 | ..... |

## ELECTIVE COURSES—Continued

| TERM: | I | II | III |
|---|---|---|---|
| **SCHOOL OF ENGINEERING AND MECHANIC ARTS**—Continued | | | |
| STRUCTURAL DESIGN: | | | |
| Elementary Structural Design (Str. Des. 101) | ..... | 3 | 3 |
| Structural Design (Str. Des. 102) | 3 | 3 | 3 |
| Structural Design (Str. Des. 103) | 4 | 3 | 4 |
| Masonry and Concrete (Str. Des. 104) | ..... | 5 | ..... |
| Design of Farm Structures (Str. Des. 105) | ..... | 3 | 3 |
| School Architecture (Str. Des. 106) | ..... | ..... | 4 |
| Farm Buildings (Str. Des. 107) | 2 | ..... | ..... |
| SURVEYING: | | | |
| Surveying (Surv. 101) | ..... | 2 | ..... |
| Surveying (Surv. 102) | ..... | ..... | 1 |
| Surveying (Surv. 103) | 2 | ..... | ..... |
| Surveying (Surv. 104) | 1 | ..... | ..... |
| Advanced Surveying (Surv. 105) | ..... | 4 | ..... |
| Advanced Surveying (Surv. 106) | ..... | ..... | 1 |
| Topographic Surveying (Surv. 107) | 1 | ..... | ..... |
| Geodesy (Surv. 108) | ..... | ..... | 2 |
| Geodesy (Surv. 109) | ..... | ..... | 1 |
| Elementary Surveying (Surv. 110) | ..... | ..... | 1 |
| Elementary Surveying (Surv. 111) | ..... | ..... | 1 |
| **SCHOOL OF HOME ECONOMICS** | | | |
| FOODS: | | | |
| Preparation and Service of Foods (Foods 101) | ..... | ..... | 6 |
| Advanced and Experimental Cookery (Foods 102-103) | ..... | 4 | 4 |
| Nutrition (Foods 104) | ..... | 5 | ..... |
| Dietetics (Foods 105) | ..... | ..... | 5 |
| Catering (Foods 106) | ..... | ..... | 3 |
| TEXTILES: | | | |
| Textiles (Tex. 101) | ..... | 1 | ..... |
| Laundering (Tex. 102) | 2 | ..... | ..... |
| Advanced Textiles (Tex. 103) | ..... | ..... | 1 |
| CLOTHING: | | | |
| Garment Construction Cloth. 101) | 2 | ..... | ..... |
| Drafting and Elementary Dress Design (Cloth. 102) | 4 | ..... | ..... |
| Dressmaking (Cloth. 103) | ..... | 3 | ..... |
| Advanced Dressmaking (Cloth. 104-105) | 2 | 2 | ..... |
| Draping and Advanced Technique of Clothing (Cloth. 106) | 5 | ..... | ..... |
| Tailoring (Cloth. 107) | ..... | 3 | ..... |
| Millinery (Cloth. 108) | ..... | 3 | ..... |
| ART: | | | |
| Composition and Design (Art 101) | ..... | 2 | ..... |
| Freehand Perspective (Art 102) | 2 | ..... | ..... |
| Costume Design (Art 103) | ..... | ..... | 3 |
| Art and Handicraft (Art 104) | 2 | ..... | ..... |
| Home Architecture and Decoration (Art 105) | 2 | ..... | ..... |
| History of Ornament and Design (Art 106) | 2 | ..... | ..... |
| HOME MANAGEMENT: | | | |
| House Administration (H. M. 101-102) | 3 | 3 | ..... |
| Home Management (Practice House) (H. M. 103) | ..... | ..... | 5 |
| Lunchroom Management (H. M. 104-105) | 3 | 3 | ..... |
| Marketing and Buying (H. M. 106) | ..... | 2 | ..... |
| Home Nursing and First Aid (H. M. 107) | ..... | 3 | ..... |

## ELECTIVE COURSES—Continued

| TERM: | I | II | III |
|---|---|---|---|
| **SCHOOL OF LIBERAL ARTS** | | | |
| ENGLISH LANGUAGE AND LITERATURE: | | | |
| Composition and Rhetoric (Eng. 101-103) | 3 | 3 | 3 |
| Technical Writing and Scientific Thought (Eng. 104-106) | 2 | 2 | 2 |
| Nineteenth Century Poetry (Eng. 107-108) | 3 | 3 | ..... |
| The Essay (Eng. 109) | ..... | ..... | 3 |
| English Words (Eng. 110) | 3 | ..... | ..... |
| Literature in America (Eng. 111-112) | ..... | 3 | 3 |
| Novelists of the Nineteenth Century (Eng. 113-114) | 3 | 3 | ..... |
| The Short Story (Eng. 115) | ..... | ..... | 3 |
| Early English Drama (Eng. 116) | 3 | ..... | ..... |
| Elizabethan Drama (Eng. 117-118) | ..... | 3 | 3 |
| Modern English Drama (Eng. 119-120) | 3 | 3 | ..... |
| Technique of the Drama (Eng. 121) | ..... | ..... | 3 |
| ANCIENT LANGUAGES AND LITERATURES: | | | |
| Beginners' Greek (A. L. 101-103) | 3 | 3 | 3 |
| Grammar, Composition, and Translation of Selected Prose Works (A. L. 104-106) | 3 | 3 | 3 |
| Greek Literature and Composition (A. L. 107-109) | 3 | 3 | 3 |
| Greek Drama (A. L. 110-112) | 3 | 3 | 3 |
| Latin Prosody and Methology (A. L. 121-123) | 3 | 3 | 3 |
| Latin Grammar, Composition, and Translation (A. L. 124-126) | 3 | 3 | 3 |
| Study of Roman Life and Customs (A. L. 127-129) | 3 | 3 | 3 |
| Critical Study of Latin Drama (A. L. 130-132) | 3 | 3 | 3 |
| MODERN LANGUAGES AND LITERATURES: | | | |
| Elementary French (M. L. 101-103) | 3 | 3 | 3 |
| Grammar Continued (M. L. 104-105) | 3 | 3 | 3 |
| Scientific French (M. L. 107-109) | 3 | 3 | 3 |
| Development of the French Novel (M. L. 110-112) | 3 | 3 | 3 |
| Seventeenth Century French Drama (M. L. 113) | 3 | ..... | ..... |
| Eighteenth Century French Drama (M. L. 114) | ..... | 3 | ..... |
| Nineteenth Century French Drama (M. L. 115) | ..... | ..... | 3 |
| History of French Literature (M. L. 116-118) | 3 | 3 | 3 |
| French for Engineers (M. L. 119-121) | 5 | 5 | 5 |
| Beginning German (M. L. 121-123) | 3 | 3 | 3 |
| Second Year German (M. L. 124-126) | 3 | 3 | 3 |
| Scientific German (M. L. 127-129) | 3 | 3 | 3 |
| Goethe and the Novel (M. L. 130) | 3 | ..... | ..... |
| Schiller and the Drama (M. L. 131) | ..... | ..... | 3 |
| Lessing and German Prose (M. L. 132) | 3 | ..... | ..... |
| Heine and German Poetry (M. L. 133) | ..... | ..... | 3 |
| History of German Literature (M. L. 134-136) | 3 | 3 | 3 |
| German for Engineers (M. L. 137-139) | 5 | 5 | 5 |
| Elementary Italian (M. L. 138-140) | 3 | 3 | 3 |
| Spanish Grammar, Conversation (M. L. 141-143) | 3 | 3 | 3 |
| Thorough Knowledge of Grammar (M. L. 144) | 3 | ..... | ..... |
| Reading and Conversation (M. L. 145) | ..... | 3 | ..... |
| Letter Writing (M. L. 146) | ..... | ..... | 3 |
| Vocabulary of Trade (M. L. 147-148) | 3 | 3 | ..... |
| Business Correspondence and Etiquette | ..... | ..... | 3 |
| Methods of Advertising in South America and Mexico Compared with Those of the U. S. (M. L. 150) | 3 | ..... | ..... |
| Study of Commercial Development (M. L. 151-152) | ..... | 3 | 3 |
| Early Spanish Literature (M. L. 153-154) | 3 | 3 | ..... |
| Seventeenth and Eighteenth Century Literature (M. L. 155) | ..... | ..... | 3 |

## ELECTIVE COURSES—Continued

| TERM: | I | II | III |
|---|---|---|---|
| **SCHOOL OF LIBERAL ARTS**—Continued | | | |
| MODERN LANGUAGES AND LITERATURES—Con. | | | |
| Spanish Literature After the Eighteenth Century (M. L. 156) | ..... | 3 | ..... |
| Literature of Spanish-Speaking Countries (M. L. 157) | ..... | ..... | 3 |
| Spanish for Engineers (M. L. 158-160) | 5 | 5 | 5 |
| HISTORY AND POLITICAL SCIENCE: | | | |
| Current History (H. 101-103) | 1 | 1 | 1 |
| American Colonial History (H. 104) | 2 | ..... | ..... |
| American Civil War and Reconstruction (H. 105) | ..... | 2 | ..... |
| Development of American Nationality (H. 106) | ..... | ..... | 2 |
| Latin American Republics (H. 107) | ..... | ..... | 2 |
| Modern and Contemporary History (H. 109-111) | 2 | 2 | 2 |
| Imperialism and World Politics (H. 112) | ..... | 2 | ..... |
| Origins and Issues of the World War (H. 113) | ..... | ..... | 2 |
| The Far East (H. 114-115) | ..... | 2 | 2 |
| Epochs in European History (H. 116-118) | 2 | 2 | 2 |
| Historiography (H. 119-121) | 2 | 2 | 2 |
| Government of the United States (Pol. Sc. 101-103) | 2 | 2 | 2 |
| American State Government (Pol. Sc. 104-105) | 2 | 2 | ..... |
| Constitutional Law of United States (Pol. Sc. 106-108) | 2 | 2 | 2 |
| Governments of Europe (Pol. Sc. 109-110) | 2 | 2 | ..... |
| Municipal Government (Pol. Sc. 111-112) | ..... | 2 | 2 |
| American Diplomacy (Pol. Sc. 113-115) | 2 | 2 | 2 |
| International Law (Pol. Sc. 116-118) | 3 | 3 | 3 |
| Political Parties and Practical Politics (Pol. Sc. 119-120) | 2 | 2 | ..... |
| Contemporary Political Problems of the United States (Pol. Sc. 121) | ..... | ..... | 2 |
| American Political Ideals (Pol. Sc. 122-123) | 2 | 2 | ..... |
| Research in Political Science (Pol. Sc. 124-126) | 2 | 2 | 2 |
| ECONOMICS AND SOCIOLOGY: | | | |
| Elements of Economics (Econ. 101-102) | 3 | 3 | ..... |
| Corporation Finance (Econ. 103) | 2 | ..... | ..... |
| Money and Banking (Econ. 104) | ..... | 2 | ..... |
| Public Finance and Taxation (Econ. 105) | ..... | ..... | 2 |
| Economic History of the United States (Econ. 106) | 3 | ..... | ..... |
| Rural Economics (Econ. 107) | ..... | 2 | ..... |
| Elements of Accounting (Econ. 108) | ..... | 3 | ..... |
| Advanced Accounting (Econ. 109) | ..... | ..... | 3 |
| Commercial Law (Econ. 110-112) | 3 | 3 | 3 |
| Elements of Sociology (Soc. 101) | ..... | 3 | ..... |
| Charities and Corrections (Soc. 102) | ..... | ..... | 3 |
| Rural Sociology (Soc. 103) | ..... | ..... | 3 |
| Social Psychology (Soc. 104) | 3 | ..... | ..... |
| Social Psychology (Soc. 105) | ..... | 3 | ..... |
| Logical Aspects of Sociology (Soc. 106) | ..... | ..... | 3 |
| Philosophical Aspects of Sociology (Soc. 107) | 3 | ..... | ..... |
| Philosophical Aspects of Sociology (Soc. 108) | ..... | 3 | ..... |
| Ethical Aspects of Sociology (Soc. 109) | ..... | ..... | 3 |
| JOURNALISM: | | | |
| News Writing (Jour. 101-102) | 3 | 3 | ..... |
| The Daily Paper (Jour. 103) | ..... | ..... | 3 |
| History of Journalism (Jour. 104) | 1 | ..... | ..... |
| Newspaper Editing (Jour. 105-107) | 2 | 2 | 2 |
| News and Editorial Writing (Jour. 108-110) | 3 | 3 | 3 |
| The Country Newspaper (Jour. 111) | 2 | ..... | ..... |
| The Trade Journal (Jour. 112) | ..... | 2 | ..... |
| Feature Writing (Jour. 113) | 3 | ..... | ..... |

## ELECTIVE COURSES—Continued

| TERM: | I | II | III |
|---|---|---|---|
| **SCHOOL OF LIBERAL ARTS**—Continued | | | |
| JOURNALISM—Continued | | | |
| Agricultural and Industrial Feature Writing (Jour. 114-115) | ..... | 3 | 3 |
| Principles of Journalism (Jour. 116) | 1 | ..... | ..... |
| Business Management, Circulation, and Advertising (Jour. 117-118) | ..... | 1 | 1 |
| Head Writing, Make-up, and Mechanical Details (Jour. 119) | 2 | ..... | ..... |
| Practical Newspaper Operation (Jour. 120-121) | ..... | 5 | 5 |
| PUBLIC SPEAKING: | | | |
| Reading and Speaking (P. S. 101-103) | 1 | 1 | 1 |
| Oratory (P. S. 104-106) | 1 | 1 | 1 |
| Extempore Speaking (P. S. 107-109) | 1 | 1 | 1 |
| Debate (P. S. 110-112) | 1 | 1 | 1 |
| Oral Reading (P. S. 113-115) | 2 | 2 | 2 |
| Oral Technical English (P. S. 116-118) | 3 | 3 | 3 |
| Advanced Oral Technical English (P. S. 119-121) | 3 | 3 | 3 |
| LIBRARY SCIENCE: | | | |
| Library Methods (L. S. 101) | 1 | ..... | ..... |
| Advanced Library Methods (L. S. 102) | ..... | 2 | ..... |
| MUSIC: | | | |
| | | 3 | |
| **DEPARTMENT OF MILITARY SCIENCE AND TACTICS** | | 2 | |
| | | 2 | |
| Basic Reserve Officers' Training Corps (M. I. 101) | 2 | | 2 |
| Basic Course (M. I. 102) | 2 | | 2 |
| Advanced R. O. T. C. (M. I. 103) | 3 | | 3 |
| Advanced R. O. T. C. (M. I. 104) | 3 | | 3 |

# DEPARTMENT OF PHYSICAL EDUCATION AND RECREATION

The Department of Physical Education and Recreation has been organized to control all physical training, recreation, intramural, and intercollegiate athletics. All work is closely coördinated and the ideal is to see that every man in the institution gets opportunities to take part in competitive sports. The plan under which the department is to operate may be summed up as follows:

1. A series of exercises arranged for every student in the institution and compulsory for all, the exercises to be based on mass exercises common in Germany and the Scandinavian countries. Neither the German nor Scandinavian system is to be used in its entirety, but a combination of the heavy gymnastic drills of the former with the lighter squad drills of the latter. All students will be given physical examination and placed in various classes according to their individual physical needs. Students will receive different kinds of work and be encouraged to take part in those games which provide the exercise of which they are most in need.

2. A general system of intramural athletics is carried out under a regular schedule with teams representing different units of the University. All students take part in one or more of these branches of sport and the University encourages enough sports to give each an opportunity. It is the aim of each class to have its own wrestling team, basket-ball team, baseball team, volley-ball team, track team, and so on for just as many teams as there are students to fill the positions. The games between these teams are carried out with regularity of schedule and supervision. Besides these, there are general competitions such as cross-country runs and interclass track meets in which representatives of all classes may compete at the same time. A regular playground is in process of construction on which will be available tennis courts, volley-ball courts, tether ball poles, stakes for pitching quoits, etc.

3. All physical training of the students, including mass exercises, intramural sports, intercollegiate competitions, and military training, henceforth are a part of the general educational system of the University.

For the present practically all general training, such as comes under the head of gymnastics and squad exercises, is conducted under direction of the Military Department.

## DEGREES CONFERRED MAY 30, 1919

This does not include the list of degrees given in the Schools in Baltimore. Nor does it include the list of students of the Baltimore Schools. Lack of time for getting out the lists prevent such inclusion this year.

### HONORARY

**Doctor of Science**

JAMES HARRIS ROGERS.....Hyattsville, Md.
FRANKLIN BYERS BOMBERGER.....College Park, Md.

**Doctor of Agriculture**

MERTON BENWAY WAITE.....Washington, D. C.

### IN COURSE

**Bachelor of Science**

JOSEPH LEITER AITCHESON.....Burtonsville, Md.
KENNETH WARREN BABCOCK.....Hagersotown, Md.
CHESTER FREDERICK BLETSCH.....Washington, D. C.
GRACE BRUCE HOLMES.....Washington, D. C.
PAUL VALENTINE HORN (Class of 1918).....Mount Airy, Md.
RANSOM RUSH LEWIS, JR.....Frederick, Md.
ERSTON VINTON MILLER.....Hagerstown, Md.
GEORGE WESLEY NORRIS.....Baltimore, Md.
KENNETH CARLISLE POSEY.....Washington, D. C.
EARLE MILTON SAWYER.....Manila, Philippine Islands
JAMES WILMER STEVENS.....Baltimore, Md.
GEORGE RAY STUNTZ.....Washington, D. C.

**Bachelor of Science in Agriculture**

ROBERT LEE SELLMAN.....Beltsville, Md.

**Bachelor of Science in Civil Engineering**

CECIL HARLOW BACON.....Silver Springs, Md.
HOMER SIDNEY BERLIN.....Baltimore, Md.
WALTER ROBERTS HARDISTY.....Seabrook, Md.

**Bachelor of Science in Electrical Engineering**

MILTON CARROLL BROWN.....Sparrows Point, Md.
EDWIN WALKER HAND.....Berwyn, Md.

**Bachelor of Science in Mechanical Engineering**

HOWARD OWEN COSTER.....Coster, Md.
CHARLES EDWIN PAINE.....Washington, D. C.

## CERTIFICATES IN TWO-YEAR COURSES ISSUED MAY 30, 1919

**Agriculture**

EMORY BRYAN CORKRAN.....Rhodesdale, Md.
THOMAS DAIL HOLDER.....Vienna, Md.
KURT FREDERICK MENZEL.....Washington, D. C.
PHILIP STEVENS RICHARDSON.....Williamsburg, Md.
HENRY LAFAYETTE UMBARGER.....Bel Air, Md.
HUGH ROBERTS WILMER (Class of 1918).....Faulkner, Md.

## TESTIMONIALS OF MERIT AWARDED MAY 30, 1919

For distinguished achievement in the promotion of the agricultural interests of Maryland:

HOWARD MANN.....Howard County
DAVID GARFIELD HARRY.....Harford County
A. P. SNADER.....Carroll County

## MEDALS AND PRIZES AWARDED MAY 30, 1910

For excellence in Debate. Medal offered by the Alumni Association:

EDWARD B. ADY.....Sharon, Md.

The Goddard Medal, for excellence in Scholarship and Moral Character—offered by Mrs. Annie K. Goddard James:

R. LEE SELLMAN.....Beltsville, Md.

For excellence in Debate, "President's Cup," offered by DR. H. J. PATTERSON:

POE LITERARY SOCIETY.

## AWARDS OF MILITARY COMMISSIONS

MILTON CARROLL BROWN.....Major
HOMER SIDNEY BERLIN.....Captain
EARLE MILTON SAWYER.....Captain
CHARLES EDWIN PAINE.....Captain
EDWIN WALKER HAND.....First Lieutenant
WALTER ROBERTS HARDISTY.....Second Lieutenant

## BATTALION ORGANIZATION

### Battalion Staff

E. C. E. RUPPERT.....Major, R. O. T. C. Commanding
R. W. HELLER.....1st Lieut., R. O. T. C. Battalion Adjutant.
J. A. GRAY.....2nd Lieut., R. O. T. C. Battalion Supply Officer.

## COMPANY OFFICERS AND NON-COMMISSIONED OFFICERS

| *Company A* | *Company B* | *Company C* |
|---|---|---|
| | **Captains** | |
| WILBUR F. STERLING | JAMES H. BARTON | THEODORE L. BISSELL |
| | **First Lieutenants** | |
| JOHN E. KEEFAUVER | EDWARD E. DAWSON | DORIAN A. ETIENNE |
| | **Second Lieutenants** | |
| CHARLES P. WILHELM | STERLING E. ABRAMS | BRADFORD L. BURNSIDE |

Additional Officer—EDWARD B. ADY, 2nd Lieutenant

## NON-COMMISSIONED STAFF OFFICERS

EDWARD F. RUSSELL.....Battalion Sergeant Major
HOWARD A. SHANK.....Battalion Supply Sergeant
CHARLES L. MULLEN.....Corporal Bugler

| *Company A* | *Company B* | *Company C* |
|---|---|---|
| | **First Sergeants** | |
| A. S. BEST | G. G. REMSBERG | C. E. MOORE |
| | **Sergeants** | |
| C. W. COLE | A. N. PRATT | R. V. HAIG |
| A. W. HINES | F. SLANKER | D. R. CALDWELL |
| C. E. DARNALL | P. S. FRANK | O. P. REINMUTH |
| H. L. BOSLEY | T. E. MARQUIS | L. W. BOSLEY |
| R. C. MCCENEY | L. E. CAUFFMAN | W. F. MCDONALD |
| C. D. MOLSTER | A. S. GADD | H. H. ANKERS |
| | F. R. CALDWELL | |
| | **Corporals** | |
| R. N. YOUNG | J. M. PRICE | K. T. BROACH |
| H. D. GILBERT | C. E. WHITE | R. J. STRANAHAN |
| J. H. PAINTER | W. A. BEACHLEY | A. J. NORTHAM |
| J. A. BURROUGHS | H. E. MCFADDIN | E. F. DARNER |
| J. A. MORAN | C. D. SASSCER | L. J. STABLER |
| A. D. KEMP | C. B. NOURSE | G. B. FITZGERALD |
| G. N. SCHRAMM | E. F. FROELICH | C. C. CRIPPEN |
| H. S. MATTHEWS | T. R. BETTS | H. E. LEVIN |
| | | C. W. ENGLAND |

## REGISTER

### Session 1919-1920

### Graduate Students

| *Name* | *Home* | |
|---|---|---|
| CHEN, CHUNJEN C..... | Shanghai ..... | China |
| HAAG, J. ROY..... | Kingston ..... | Rhode Island |
| JONES, JOHN P..... | Davidsonville ..... | Anne Arundel |
| LEUKEL, ROBERT W..... | Brillion ..... | Wisconsin |
| MARTIN, JOHN H..... | Corvallis ..... | Oregon |
| MILLER, E. V..... | Hagerstown ..... | Washington |
| NICKELS, CLARENCE B..... | Artesia ..... | Mississippi |
| PARFITT, ELLIOTT H..... | Brooklyn ..... | New York |
| RHODE, W. C..... | Baltimore ..... | Maryland |
| SANDO, CHARLES E..... | Washington ..... | District of Columbia |
| SMITH, ARTHUR M..... | College Park..... | Prince George's |
| STANTON, THOMAS R..... | Hyattsville ..... | Prince George's |

## Senior Class

| *Name* | *Home* | *County or State.* |
|---|---|---|
| ABRAMS, STERLING E | Jersey City | New Jersey |
| ADY, EDWARD B | Sharon | Harford |
| AXT, RIDGELY W | Catonsville | Baltimore |
| BARTON, J. HALL | Centreville | Queen Anne |
| BISSELL, THEODORE L | Westover | Somerset |
| BURNSIDE, BRADFORD L | Hyattsville | Prince George's |
| CARROLL, HENRY M | Ashland | Baltimore |
| CHICHESTER, PETER W | Aquasco | Prince George's |
| CLENDANIEL, GEORGE W | Kennedyville | Kent |
| CONYNGTON, JOHN | Berwyn | Prince George's |
| DAVISON, BAUSSON | Riverdale | Prince George's |
| DAWSON, EDWARD E | Trappe | Talbot |
| DAY, FRANKLIN D | Burdette | Montgomery |
| DOWNIN, THOMAS V | Williamsport | Washington |
| DRAWBAUGH, JOHN R | Washington | District of Columbia |
| ELLIOTT, CHARLES S | Westover | Somerset |
| EPPLEY, GEARY F | Washington | District of Columbia |
| ETIENNE, ARTHUR D | Berwyn | Prince George's |
| EZEKIEL, WALTER | Landover | Prince George's |
| GRAY, JOSEPH A | Brownville | Washington |
| HARTSHORN, HOSMER P | Kensington | Montgomery |
| HICKS, WILLIAM P | Govans | Maryland |
| HOCKMAN, GEORGE B | Hagerstown | Washington |
| HOOK, ELIZABETH G | College Park | Prince George's |
| JONES, ALLEN S | Washington | District of Columbia |
| KEEFAUVER, JOHN E | Berwyn | Prince George's |
| KNODE, JOHN S | Baltimore | Maryland |
| KNODE, ROBERT T | Baltimore | Maryland |
| LANGRALL, JAMES H | Baltimore | Maryland |
| MCDONALD, HARRY M | Barton | Allegany |
| MATZEN, BRODER A | Berwyn | Prince George's |
| MERRILL, GEORGE M | Crisfield | Somerset |
| PERKINS, HANSON T | Springfield | Prince George's |
| PRATT, ALGIO N | Newark | New Jersey |
| RUPPERT, ERNEST C. E., JR. | Chevy Chase | District of Columbia |
| RIGGS, MAURICE T | Rockville | Montgomery |
| SANDO, WILLIAM J | Washington | District of Columbia |
| SEWELL, MILTON D | Hyattsville | Prince George's |
| SNARR, WARDNEY C | Washington | District of Columbia |
| STARR, JAMES H | Washington | District of Columbia |
| STERLING, WILBUR F | Crisfield | Somerset |
| TERNENT, SAMPSON S | Lonaconing | Allegany |

## Junior Class

| | | |
|---|---|---|
| BLAND, HARRIET W | Sparks | Baltimore |
| CALDWELL, DAVID R | Washington | District of Columbia |
| COLE, CHARLES W | Towson | Baltimore |
| DIGGS, AUSTIN C | Baltimore | Maryland |
| DINGMAN, JAMES E | Berwyn | Prince George's |
| DONALDSON, EDMUND C | Laurel | Prince George's |
| EDMONDS, LETHA G | Rockville | Montgomery |
| EISEMAN, JOHN H | Washington | District of Columbia |
| FRERE, FRANCIS J | Tompkinsville | Charles |

| *Name* | *Home* | *County or State.* |
|---|---|---|
| FUHRMAN, CARL J | Brentwood | Prince George's |
| GARDNER, WM. THOMAS | Clear Spring | Washington |
| GOODWIN, LEONARD M | Potsdam | New York |
| GRAHAM, JULIAN R | Barclay | Queen Anne |
| HAIG, ROBERT V | Riverdale | Prince George's |
| HAMKE, JULIUS C | College Park | Prince George's |
| HELLER, ROBERT W | Annapolis | Anne Arundel |
| HOLDER, THOMAS D | Vienna | Dorchester |
| HOLTER, CECIL K | Jefferson | Frederick |
| HOLTER, EDWARDS F | Middletown | Frederick |
| JESTER, WILLIAM C | Wilmington | Delaware |
| JOHNSON, CLARENCE E | Brooklyn | New York |
| MACKERT, CHARLES L | Sunbury | Pennsylvania |
| MANNING, ROGER C | Branlywine | Prince George's |
| PEDDICORD, HERBERT R | Dickerson | Montgomery |
| PERRY, DEWITT P | Clear Spring | Washington |
| RAUSCH, ROBERT M | Washington | District of Columbia |
| READING, JOSEPH G | Rockville | Montgomery |
| SCHEUCH, JOHN D | Washington | District of Columbia |
| SENER, HERMAN H | Chewsville | Washington |
| SILBERMAN, HARRY A | Washington | District of Columbia |
| SLANKER, FREDERICK | Washington | District of Columbia |
| SMITH, JOHN W | Norfolk | Virginia |
| SNYDER, LEO WILLIAM | Washington | District of Columbia |
| STARKEY, EDGAR B | Sudlersville | Queen Anne |
| STONESTREET, NICHOLAS V | Rock Point | Charles |
| SULLIVAN, JERE H | Newburyport | Massachusetts |
| THAWLEY, LEONARD H | Laurel | Prince George's |
| THOMAS, RICHARD BRANSON | Washington | District of Columbia |
| TWILLEY, OTIS S | Hurlock | Dorchester |
| WALKER, PAUL W | Mt. Airy | Frederick |
| WILHELM, CHARLES P | Baltimore | Maryland |

**Sophomore Class**

| | | |
|---|---|---|
| ALLISON, BREWSTER | Stony Point | New York |
| AUSTIN, JAMES A | College Park | Prince George's |
| AVERY, HELENA D | Washington | District of Columbia |
| BAILEY, CALEB T | Bladensburg | Prince George's |
| BARALL, WILLIAM LOUIS | Towson | Baltimore |
| BEACHLEY, RALPH H | Middletown | Frederick |
| BEST, ALFRED S | Harwood | Anne Arundel |
| BOSLEY, HARRY L | Washington | District of Columbia |
| BOSLEY, LESTER W | Washington | District of Columbia |
| BROACH, KEATOR T | Ridgewood | New Jersey |
| BROWN, CHAUNCEY | Washington | District of Columbia |
| BURGESS, EDGAR A | Thurmont | Frederick |
| BURROUGHS, JOHN A | Clinton | Prince George's |
| BUSCK, PAUL G | Washington | District of Columbia |
| BUTTS, JOHN A | Loysburg | Pennsylvania |
| CALDWELL, FRANK R | Washington | District of Columbia |
| CALVIN, GEORGE F | Washington | District of Columbia |
| CANTER, FRANCIS D | Aquasco | Prince George's |
| DARKIS, FREDERICK R | Frederick | Frederick |
| DARNALL, CHARLES E | Hyattsville | Prince George's |

| *Name* | *Home* | *County or State.* |
|---|---|---|
| DARNER, EDWIN F | Hagerstown | Washington |
| DUVALL, WILLIAM M | Baltimore | Baltimore City |
| DUNNING, ERNEST C | Baltimore | Baltimore City |
| EDMONDS, HENRY GORDON | Brookland | District of Columbia |
| ELDER, JAMES W | Cumberland | Allegany |
| ENGLAND, CHARLES W | Rising Sun | Cecil |
| ENSOR, HULDAH | Sparks | Baltimore |
| EWALD, FRANCIS G | Mt. Savage | Allegany |
| EZEKIEL, BERTHA | Landover | Prince George's |
| FILBERT, EDWIN B | Baltimore | Baltimore City |
| FISHER, HENRY | Hillsboro | Caroline |
| GILBERT, HERBERT D | Frederick | Frederick |
| GRAHAM, WALTER S | Hyattsville | Prince George's |
| GUREVICH, HENRY J | Washington | District of Columbia |
| HANFORD, REGINALD B | Marion | Somerset |
| HINES, AUGUSTUS W | Washington | District of Columbia |
| HODGINS, ROBERT J | Union City | Pennsylvania |
| KEEN, HOWARD V | Philadelphia | Pennsylvania |
| KEMP, ALLEN D | Frederick | Frederick |
| KIRBY, WILLIAM W | Washington | District of Columbia |
| MCDONALD, WILLIAM F | Barton | Allegany |
| MALCOLM, WILBUR G | Barton | Allegany |
| MATTHEWS, IRVING W | Sparks | Baltimore |
| MILLER, ALBERT A | College Park | Prince George's |
| MOHLHENRICH, EUGENE G | Govans | Baltimore City |
| MOLSTER, CHARLES B | Washington | District of Columbia |
| MOORE, CHARLES E., JR | Roland Park | Baltimore City |
| MORGAN, JOHN A | Frederick | Frederick |
| MORGAK, EDWIN K | Washington | District of Columbia |
| MORGAN, PAUL T | Baltimore | Baltimore City |
| MYERS, EDWIN H. L | Washington | District of Columbia |
| NEIGHBOURS, HERBERT E | Lewistown | Frederick |
| NEWELL, STERLING R | Falls Church | Virginia |
| NORTHAM, ALFRED J | Pocomoke | Worcester |
| NORWOOD, FREDERICK J | Washington | District of Columbia |
| OWINGS, ELLIOTT P | North Beach | Calvert |
| PAINTER, JOHN H | Washington | District of Columbia |
| PARSLY, GEORGE M | Brookeville | Montgomery |
| PETERMAN. WALTER W | Clear Spring | Washington |
| POLK, LAWRENCE W | Pocomoke | Somerset |
| PRICE, JOHN M., JR | Centreville | Queen Anne |
| PUSEY, MERWYN L | Baltimore | Baltimore City |
| RAEDY, MICHAEL L | Washington | District of Columbia |
| REINMUTH, OTTO P. H | Frederick | Frederick |
| REMSBERG, GERALD G | Braddock Heights | Frederick |
| REYNOLDS, CLAYTON | Port Deposit | Cecil |
| RUSSELL, EDGAR F | Washington | District of Columbia |
| SASSCER, CLARENCE D | Northkeys | Prince George's |
| SCHRAMM, GEORGE NELSON | Cumberland | Allegany |
| SCOTT, JOSEPH G | Princess Anne | Somerset |
| SHANK, HUGHES A | Smithsburg | Washington |
| SMITH, GEORGE F | Big Spring | Washington |
| SMITH, MILDRED P | Brookland | District of Columbia |
| SNYDER, JAMES H | Lewistown | Frederick |

| *Name* | *Home* | *County or State.* |
|---|---|---|
| STABLER, LAWRENCE J | Washington | District of Columbia |
| STRANAHAN, ROBERT J | Union City | Pennsylvania |
| SUTTON, ROLAND | Ballston | Virginia |
| TARBERT, REBECCA | Glencoe | Baltimore |
| WARD, JOSHUA B | Jarrettsville | Harford |
| WHITE, WILFRED F | Chevy Chase | Montgomery |
| YOSHIKAWA, MASANORI | Hyuga | Japan |
| YOUNG, ROBERT N | Washington | District of Columbia |

## Freshman Class

| *Name* | *Home* | *County or State.* |
|---|---|---|
| ADY, ELIZABETH G | Sharon | Harford |
| ALBRITTAIN, MASON C | La Plata | Charles |
| ANDERSON, MARY P | Washington | District of Columbia |
| BALDWIN, FRANCIS W., JR | Huntingdon | Pennsylvania |
| BARNES, BENJAMIN F | Princess Anne | Somerset |
| BEACHY, WALTER A | Grantsville | Garrett |
| BELT, WILLIAM B | Hyattsville | Prince George's |
| BENNETT, FRANK A | Hagerstown | Washington |
| BENSON, GEORGE R | Westminster | Carroll |
| BESLEY, ARTHUR K | Baltimore | Baltimore City |
| BETTS, THOMAS R | Oberlin | Ohio |
| BLANTON, FRANK M | Elkton | Cecil |
| BLOCK, ALBERT | Laurel | Prince George's |
| BOTELER, HOWARD M | Laurel | Prince George's |
| BOYER, OLIVER P | Perryman | Harford |
| BRANNER, CLAUDE E | Pocomoke | Somerset |
| BRAUNGARD, JOHN E | Hagerstown | Washington |
| BRAUNGARD, PAUL J | Hagerstown | Washington |
| BREWER, CHARLES M | College Park | Prince George's |
| BROMLEY, GEORGE R | Stockton | Worcester |
| BROTHERS, MAURICE F | Washington | District of Columbia |
| BROWN, LEO T | Washington | District of Columbia |
| BUCHHEISTER, GEORGE G | Leeland | Prince George's |
| BURROUGHS, JAMES E | La Plata | Charles |
| CADLE, WILLIAM R | Ijamsville | Frederick |
| CANNON, LLOYD P | Preston | Caroline |
| CHAMBERS, DONALD L | Baltimore | Baltimore City |
| CHAPPELL, KENNETH B | Kensington | Montgomery |
| CHASE, RALPH H | Washington | District of Columbia |
| CLAGETT, JOHN F | Marlboro | Prince George's |
| CLARK, CHARLES F | Pelham Manor | New York |
| CLARK, JOHN | Walkersville | Frederick |
| COHEN, ALFRED B | Chestertown | Kent |
| COMPHER, CARLTON M | Doubs | Frederick |
| COMPTON, STEPHEN J | Westwood | Prince George's |
| CONKLING, JOHN F | Baldwin | Baltimore |
| COOK, CHARLES S | Frederick | Frederick |
| CROWTHER, ELIZABETH G | Sparks | Baltimore |
| DIEKROEGER, FRED E | Gerald | Missouri |
| DIETZ, GEORGE J | Baltimore | Baltimore City |
| DONALDSON, DEWITT C | Laurel | Prince George's |

| *Name* | *Home* | *County or State.* |
|---|---|---|
| DOWNIN, LAURAN P | Hagerstown | Washington |
| ELLIOTT, JOSEPH W | Westover | Somerset |
| ELLIS, L. HERMINIA | Washington | District of Columbia |
| FINNEY, ARGYLE N | Washington | District of Columbia |
| FITZGERALD, GILBERT B | Princess Anne | Somerset |
| FITZGERALD, THOMAS H | Princess Anne | Somerset |
| FLANAGAN, SHERMAN E | Walkersville | Frederick |
| FRANK, PAUL S | Falls Church | Virginia |
| FRANTZ, DONALD H | Lutherville | Baltimore |
| FRIDINGER, NORMAN S | Washington | District of Columbia |
| FUHRMAN, RUTH | Washington | District of Columbia |
| GADD, ALBERT S | Centreville | Queen Anne |
| GIFFORD, GEORGE E | Rising Sun | Cecil |
| GILLESPIE, REES A | Fort Washington | Prince George's |
| GLASS, JOHN D | Conway Springs | Kansas |
| GRAVES, ERNEST A | Washington | District of Columbia |
| GROTON, ALVEY B | Pocomoke | Worcester |
| GROVES, JOHN | Washington | District of Columbia |
| HAMMOND, JAMES D | Alexandria | Alexandria |
| HARLEY, CLAYTON P | Royersford | Pennsylvania |
| HARLOW, JAMES H | Havre de Grace | Harford |
| HAWKINS, JOSEPH M., JR | Harrisburg | Pennsylvania |
| HEATH, MARGUERITE F | Baltimore | Baltimore City |
| HICKEY, WILLIAM F | Delmar | Wicomico |
| HIGHTMAN, FLOYD H | Burkittsville | Frederick |
| HIMMELHEBER, JAMES B | Annapolis | Anne Arundel |
| HODGINS, HERBERT W | Union City | Pennsylvania |
| HOLDEN, MILTON M | Princess Anne | Somerset |
| HUTTON, JOSIAH J | Brookeville | Montgomery |
| JONES, MILBURNE W | Chestertown | Kent |
| KILLIAM, AUDREY | Delmar | Wicomico |
| KISLIUK, DAVID E | Washington | District of Columbia |
| KLINE, RALPH G | Frederick | Frederick |
| KOOGLE, PAUL W | Brunswick | Frederick |
| LATTA, JAMES B | Washington | District of Columbia |
| LESCURE, JOHN M | Harrisburg | Pennsylvania |
| LESCURE, WM. JOSEPH | Harrisburg | Pennsylvania |
| LEVIN, HYMAN E | Baltimore | Baltimore City |
| LIGHTER, RICHARD C | Middletown | Frederick |
| LUCKEY, GEORGE J | Trenton | New Jersey |
| MCBRIDE, AUSTIN A | Middletown | Frederick |
| MCCALL, ELIZABETH L | College Park | Prince George's |
| MCCENEY, ROBERT S | Silver Spring | Montgomery |
| MCKEEVER, GALEN W | Kensington | Montgomery |
| MARKER, RUSSELL E | Hagerstown | Washington |
| MARQUIS, THEODORE E | Washington | District of Columbia |
| MATHIAS, LEONARD G | Hagerstown | Washington |
| MATTHEWS, HARRIS S | La Plata | Charles |
| MELLOR, SIDNEY M | Hagerstown | Washington |
| MELVIN, WILLIS G | Havre de Grace | Harford |
| MIEDWIG, JOHN M | Baltimore | Baltimore City |
| MILLER, THOMAS K | Havre de Grace | Harford |
| MOLLOY, THOMAS J | Catonsville | Baltimore City |
| MOORE, JOHN F | Washington | District of Columbia |

| *Name* | *Home* | *County or State.* |
|---|---|---|
| MOSS, HOWARD I. | Govans | Baltimore City |
| MULLEN, CHARLES L. | Hagerstown | Washington |
| MULLINEAUX, PAUL T. | Mount Airy | Carroll |
| MUMFORD, JOHN WESLEY. | Newark | Worcester |
| NAUDAIN, MORGAN C. | Sparrow's Point | Baltimore |
| NELSON, ALMON S. | Washington | District of Columbia |
| NICHOLS, NORRIS N. | Delmar | Wicomico |
| NICHOLS, ROBERT S. | Delmar | Wicomico |
| NISBET, ANDREW N. | Baltimore | Baltimore City |
| NOCK, RANDOLPH M. | Stockton | Worcester |
| PARKS, FRED H. | Timonium | Baltimore |
| PORTER, ROBERT G. | Hyattsville | Prince George's |
| POSEY, MARION W. | La Plata | Charles |
| POWELL, ROBERT W. | Princess Anne | Somerset |
| QUAINTANCE, HOWARD W. | Washington | District of Columbia |
| QUAINTANCE, LELAND C. | Washington | District of Columbia |
| REED, RAYMOND B. | College Park | Prince George's |
| REINMUTH, KARL E. | Frederick | Frederick |
| REPPERT, RUTH I. | Takoma Park | District of Columbia |
| RICHARD, WILLIAM J. | Goldsboro | Caroline |
| ROGERS, JOSEPH H. | Hyattsville | Prince George's |
| ROSENBERG, CHARLES I. | Hyattsville | Prince George's |
| SCHAEFER, JOHN P. | Riverdale | Prince George's |
| SHAMBACH, FRANK M. | Baltimore | Baltimore City |
| SHAW, ELVA M. | Barton | Allegany |
| SHETZEN, WILLIAM. | Brooklyn | New York |
| SIMONS, ROLAND E. | Washington | District of Columbia |
| SKILLING, FRANCIS C. | Baltimore | Baltimore City |
| SLINGLAND, EARL J. | Allendale | New Jersey |
| SMITH, NELLIE O. | Brookland | District of Columbia |
| SPENCE, VIRGINIA I. | College Park | Prince George's |
| STANTON, GUY S. | Grantsville | Garrett |
| STOLL, CHARLES C. | Brooklyn | Baltimore |
| STRAKA, ROBERT P. | Homestead | Pennsylvania |
| STURGIS, WILLIAM C. | Snow Hill | Worcester |
| SWAN, GERALD A. | Washington | District of Columbia |
| TAVENNER, DONALD B. | Laurel | Prince George's |
| TERRY, HENRY M. | Washington | District of Columbia |
| THOMPSON, RUTH A. | Brookland | District of Columbia |
| TOADVINE, HARRY L. | White Haven | Wicomico |
| TOWBES, LOUIS H. | Washington | District of Columbia |
| TROY, VIRGIL S. | Centreville | Queen Anne |
| VAN SANT, BAYARD R. | Greensboro | Caroline |
| VINCENT, JAMES M. | Hyattsville | Prince George's |
| WALKER, LEWIS J. | Clarksburg | West Virginia |
| WALLIS, ALBERT G. | Frederick | Frederick |
| WATKINS, DONALD E. | Mount Airy | Carroll |
| WATKINS, ROBERT M. | Mount Airy | Carroll |
| WHITE, CHARLES E. | College Park | Prince George's |
| WICK, GEORGE A. | Washington | District of Columbia |
| WYNKOOP, JAMES C. | Washington | District of Columbia |
| YOWLER, CLARENCE J. | Smithsburg | Washington |
| ZEPP, WILLARD E. | Clarksville | Howard |

## Second-Year Agricultural Class

| *Name* | *Home* | *County or State.* |
|---|---|---|
| ANKERS, HATCHER H. | Sterling | Virginia |
| BURT, RONALD T. | Westover | Somerset |
| CAUFFMAN, LAWRENCE E. | Merchantville | New Jersey |
| CHAPMAN, GEORGE B. | Woodstock | Virginia |
| DAVIS, MALCOLM. | Washington | District of Columbia |
| DONOVAN, CHARLES A. | Washington | District of Columbia |
| DOWS, ARTHUR P. | Riverside | Charles |
| EVANS, FRANK L. | Charleston | West Virginia |
| FROELICH, EDWIN F. | Crisfield | Somerset |
| FUSSELBAUGH, WILLIAM P. | Baltimore | Baltimore City |
| JAMES, WILLIAM B. | Hancock | Washington |
| JARRELL, CHARLES L. | Greensboro | Caroline |
| MYERS, ALLYN H. | Winchester | Virginia |
| NOURSE, CLARENCE B. | Alexandria | Virginia |
| RIDOUT, CHARLES D. | Annapolis | Anne Arundel |

## Second-Year Mechanic Arts Class

| | | |
|---|---|---|
| CRIPPEN, CLARENCE C. | Hurlock | Dorchester |
| EDEL, SAMUEL T. | Baltimore | Baltimore City |
| GRIEST, JAMES R. | Washington | District of Columbia |
| MCFADDIN, HARVIN E. | Hagerstown | Washington |

## First-Year Agricultural Class

| | | |
|---|---|---|
| ALDERTON, THOMAS E. | Takoma Park. | Montgomery |
| BARRON, ALEXANDER M. | Collingswood | New Jersey |
| BELT, JAMES D. | Island Creek. | Calvert |
| BENNETT, JAMES A. | Vienna | Dorchester |
| BRANNER, CECIL G. | Pocomoke | Somerset |
| CRONE, GEORGE A. | Jessup | Howard |
| DE YCAZA, JUAN M. | New York City. | New York |
| FANCIULLI, JACK H. | Washington | District of Columbia |
| GUNDRY, RICHARD. | Catonsville | Baltimore |
| JOHNSTON, REGINALD G. | Geneva | New York |
| JONES, ARTHUR. | Davidsonville | Anne Arundel |
| KRAUK, EDWARD B. | Colgate | Baltimore |
| KUBITZ, ERICH. | Annapolis | Anne Arundel |
| MAHAN, JOSEPH F. | Forest Hill. | Harford |
| MELROY, MALCOLM B. | Washington | New Jersey |
| MUNCASTER, JOHN E. | Rockville | Montgomery |
| NORTHAM, A. FLOYD. | Pocomoke | Worcester |
| RICHARDSON, EDWARD M. | Washington | District of Columbia |
| STRAWN, FAKR W. | Landover | Prince George's |
| STUBBLEFIELD, WILLIAM L. | Washington | District of Columbia |
| TURNER, H*WARD W. | White Hall. | Harford |
| UMBARGER, GARDNER T. | Aberdeen | Harford |
| UMBARGER, MARVIN D. | Bel Air. | Harford |

## First-Year Mechanic Arts Class

| *Name* | *Home* | *County or State.* |
|---|---|---|
| DIGGS, JOHN G. K. | Baltimore | Baltimore City |
| KETCHAM, JOHN R. | Solomons | Calvert |
| LEWIS, PAUL D. | Newport News | Virginia |
| OWENS, WILLIAM H. | Riverdale | Prince George's |
| SCHOTT, LOREN F. | Mount Rainier | Prince George's |
| SMITH, HARRY B. | Hurlock | Dorchester |
| STANFIELD, EDWARD F. | Roslyn | Baltimore |

## Unclassified

| | | |
|---|---|---|
| BARRETT, ALFRED J. | Washington | District of Columbia |
| BARROW, JOHN M. | Forest Hill | Harford |
| CHASE, FRANK S. | White Stone | Virginia |
| CLARKE, GLEN M. | Clarksville | Howard |
| COOK, ELIZABETH | Lanham | Prince George's |
| CRAWFORD, ARNOLD N. | Cecilton | Howard |
| CROOKS, WILLIAM S. | Baltimore | Baltimore City |
| GINGRICH, ROY M. | Palmyra | Pennsylvania |
| GROTON, THOMAS C. | Pocomoke | Worcester |
| ILITCH, DUSHAN M. | Padsg | Serbia |
| KILE, BRYAN Z. | Ridgeland | Mississippi |
| MACDONALD, ALEXANDER | Washington | District of Columbia |
| MALONE, RUTH F. | College Park | Prince George's |
| MANN, RIBORG G. | Washington | District of Columbia |
| MENZEL, KURT F. | College Park | Prince George's |
| MOORE, NATHAN C. | Rochester | New York |
| NELSON, GORDON V. | Newport News | Virginia |
| PAGANUCCI, ROMEO J. | Waterville | Maine |
| PERRIE, ALVIN L. | Clinton | Prince George's |
| POLLOCK, GEORGE F. | Boyds | Montgomery |
| ROEMER, JOHN P. | Milwaukee | Wisconsin |
| STEIDEL, OSCAR L. | Washington | District of Columbia |
| THOMPSON, BERTINA | Riverdale | Prince George's |
| TRAIL, OSCAR | Easton | Talbot |
| UMBARGER, HENRY L. | Bel Air | Harford |
| WILTSHIRE, TURNER H. | Baltimore | Baltimore City |

## Federal Board for Vocational Education Students (Rehabilitation)

| | | |
|---|---|---|
| BARTON, WILEY O. | Sugar Grove | Virginia |
| BEATY, OSCAR C. | Washington | District of Columbia |
| BIRD, JAMES F. | Jackson | Wyoming |
| BISHOP, JOHN | Washington | District of Columbia |
| BOYD, HARRY BURDETTE | Baltimore | Baltimore City |
| BRANNAN, THOMAS C. | Washington | District of Columbia |
| CANNON, AMOS P. | Salisbury | Wicomico |
| CAREW, JOHN N. | Baltimore | Baltimore City |
| CARTER, LLOYD S. | Westover | Somerset |
| CHALMERS, JAMES S. | Riverdale | Prince George's |
| COLMAN, PERRY H. | Washington | District of Columbia |
| COOPER, CHARLES H. | Hampstead | Carroll |
| COYLE, JOHN W. | East Syracuse | New York |

| *Name* | *Home* | *County or State.* |
|---|---|---|
| DALTON, ROBERT F | Richmond | Virginia |
| EDMUNDS, HENRY R | Farmsville | Virginia |
| FLYNN, LEO G | College Park | Prince George's |
| FRANZ, RAYMOND E | Baltimore | Baltimore City |
| FRIEND, CLARENCE | Hodgenville | Kentucky |
| GARNETT, ROBERT C | Washington | District of Columbia |
| GRIGG, JOSEPH B | Washington | District of Columbia |
| HANCOCK, HUGH | Huddleston | Virginia |
| HARNSBERGER, JOHN H | Catlett | Virginia |
| HARRIS, FRANK B | Baltimore | Baltimore City |
| HAWTHORNE, N. B., JR | Round Hill | Virginia |
| HESS, OSCAR C | Baltimore | Baltimore City |
| HOLLAND, ARTHUR H | Pemberton | Virginia |
| HOLMES, ORLAND D | Richmond | Virginia |
| HOWELL, CLARENCE L | Chase City | Virginia |
| HUGHES, GEORGE D | Baltimore | Baltimore City |
| JAMES, HOWARD V | Williamsburg | Virginia |
| JUGCHEK, MAX | College Park | Prince George's |
| KESSLER, THOMAS J | Baltimore | Baltimore City |
| KNAPPEN, JUDSON N. C | Washington | District of Columbia |
| LEPREAUX, WILLIAM N | Sterling | Virginia |
| LEWIS, LONGWORTH B | Montross | Virginia |
| LINT, DAVID L | Washington | District of Columbia |
| LIPSCOMB, THOMAS E | Washington | District of Columbia |
| LUDLUM, SAMUEL L | Bethesda | Montgomery |
| MORRIS, FLOYD B | Centreville | Queen Anne |
| NEHRING, HENRY F | Laurel | Prince George's |
| PHELPS, JOSEPH | Cambridge | Dorchester |
| PULLEN, JESSE P | Martinsville | Virginia |
| REDMOND, JOHN E | Frederick | Frederick |
| RYAN, WILLIAM T | Washington | District of Columbia |
| RYBAK, JOSEPH | Baltimore | Baltimore City |
| SAUNDERS, WILLIAM G | Landover | Prince George's |
| SCRUGGS, ALBERT T | Depot | Virginia |
| SHAFFER, HARRY H | Upperco | Baltimore |
| SHEPHERD, MATSON W | Berwyn | Prince George's |
| SIMMONS, FRANK M | Chicago | Illinois |
| SITWELL, HERBERT C. F | Bedford | Virginia |
| SLEETH, JAMES R | Ronceverte | West Virginia |
| SNELL, ROBERT L | Naranja | Florida |
| TELMAN, JOHN | Baltimore | Baltimore City |
| TRIPLETT, CHARLES C | Brunswick | Frederick |
| WEISS, EDWARD F | Baltimore | Baltimore City |
| WHEEDLETON, WILLIAM C | East New Market | Dorchester |
| WILBAND, SEWARD E | Seattle | Washington |
| WINEBRENNER, JOSEPH J | Cumberland | Allegany |

**Industrial Teacher Training Courses (Baltimore)**

| | | |
|---|---|---|
| AULBACH, HARRY W | Baltimore | Baltimore City |
| BAKER, EDWIN | Baltimore | Baltimore City |
| BALL, HARRY E | Baltimore | Baltimore City |
| CALDWELL, H. L | Baltimore | Baltimore City |
| CALL, LEO F | Baltimore | Baltimore City |
| COOK, CONRAD | Baltimore | Baltimore City |

| *Name* | *Home* | *County or State.* |
|---|---|---|
| ENGEL, LOUIS | Baltimore | Baltimore City |
| GREEN, GEORGE W | Baltimore | Baltimore City |
| KERNER, WILLIAM | Baltimore | Baltimore City |
| KNOCHEL, ULYSSES S | Baltimore | Baltimore City |
| KUEBERTH, HARRY J | Baltimore | Baltimore City |
| PANETTIERE, VINCENT | Baltimore | Baltimore City |
| PRENDER, GEORGE | Baltimore | Baltimore City |
| RIVERS, HARRY CLERMONT | Baltimore | Baltimore City |
| SENDELBACH, JOHN F | Baltimore | Baltimore City |
| SKINNER, ROSS K | Baltimore | Baltimore City |
| SMITH, FERDINAND C | Baltimore | Baltimore City |
| TAYLOR, LEWIS T | Baltimore | Baltimore City |
| WALSH, M. L | Baltimore | Baltimore City |
| WILLHIDE, PAUL A | Baltimore | Baltimore City |

## STUDENTS IN THE SUMMER SCHOOL

| | | |
|---|---|---|
| ABELL, DAISY S | St. Imgoes | St. Mary's |
| ABELL, EMERALD | St. Imgoes | St. Mary's |
| ABRAMS, STERLING E | Hagerstown | Washington |
| ADAMS, ANNIE C | Baden | Prince George's |
| ADAMS, PHYLLIS G | Atholton | Howard |
| ADOMS, J. HOLLAND (Mrs.) | Waldorf | Charles |
| AIST, ELSIE | Cheltenham | Prince George's |
| ALRBITTAIN, MARIA L | La Plata | Charles |
| ALBRITTAIN, PEARL M | La Plata | Charles |
| ALLEE, HELEN M | Cumberland | Allegany |
| ANDREW, MILDRED A | Denton | Caroline |
| ATKINS, ALME L | La Plata | Charles |
| AXT, RIDGELY W | Baltimore | Baltimore City |
| BADEN, CLARA G | Brandywine | Prince George's |
| BADEN, EDNA I | Baden | Prince George's |
| BADEN, ELIZABETH L | Baden | Prince George's |
| BAITY, EARL C | Streett | Harford |
| BARALL, WILLIAM L | Towson | Baltimore |
| BARNES, LUCILLE M | Port Tobacco | Charles |
| BEALL, RUTH E | Poolesville | Montgomery |
| BEALL, VIRGIE M | Germantown | Montgomery |
| BEALL, WALLACE R | Libertytown | Frederick |
| BENNETT, FRANCES L. S | Churchton | Anne Arundel |
| BIDDINGER, VIRGINIA L | Walkersville | Frederick |
| BIGGS, IRMA V | Frederick | Frederick |
| BISSELL, DOROTHY E | Westover | Somerset |
| BLOOM, LOUISE M | Ellicott City | Howard |
| BOARMAN, SARA S | Bel Air | Harford |
| BODMER, JESSIE M | Poolesville | Montgomery |
| BOWERMAN, ROSALIE S | Loreley | Baltimore |
| BRANNER, RUTH M | Pocomoke City | Worcester |
| BROOKBANK, ANNIE V | Charlotte Hall | St. Mary's |
| BROWN, HOWARD | Bladensburg | Prince George's |
| BUCKEY, HATTIE McE | Frederick | Frederick |
| BUCKINGHAM, BERYL B | Mt. Airy | Carroll |
| BURDETTE, EUNICE E | La Plata | Charles |
| BURROUGHS, LOUISE | Clinton | Prince George's |

| *Name* | *Home* | *County or State.* |
|---|---|---|
| CALTRIDER, SAMUEL P. | Westminster | Carroll |
| CAMPBELL, SARAH M. | Baltimore | Baltimore City |
| CARRICK, MARY A. | Capitol Heights | Prince George's |
| CASTELLA, OLIVE W. | Riverdale | Prince George's |
| CHAPMAN, NANNIE T. | Spring Hill | Charles |
| CHRISTOPHER, NELLIE W. | Cambridge | Dorchester |
| CLEARY, HAZEL K. | Mt. Airy | Carroll |
| CLINE, ANNA G. | Frederick | Frederick |
| COLEMAN, CORA M. | Chester | Queen Anne's |
| COMBS, MARY E. | Ridge | St. Mary's |
| COMER, ALVERTA E. | Frederick | Frederick |
| CONYNGTON, JOHN | Berwyn | Prince George's |
| CRAMER, BLANCHE B. (Mrs.) | Glen Echo | Montgomery |
| CRAWFORD, RUBY | Quantico | Wicomico |
| CROMWELL, NANNIE W. | Poolesville | Montgomery |
| CROOKS, WILLIAM S. | Baltimore | Baltimore City |
| CROSS, JANIE A. | Westwood | Prince George's |
| CULBERTSON, MARY W. | Baltimore | Baltimore City |
| DAIL, JESSIE R. | Salem | Dorchester |
| DONAHOE, MAMIE C. | Massey | Kent |
| DORSEY, ETHEL A. | Beltsville | Montgomery |
| DOUB, ROSCOE M. | Middletown | Frederick |
| DOWNIN, THOMAS V. | Williamsport | Washington |
| DRAWBAUGH, JOHN R. | Washington | District of Columbia |
| EARNEST, HAZEL V. | Mt. Rainier | Prince George's |
| EBERT, CATHERINE G. | Baltimore | Baltimore City |
| EDWARDS, FANNIE I. | Massey | Kent |
| EDWARDS, MYRTLE E. | Bengies | Baltimore |
| EVANS, FRANK L. | Charleston | West Virginia |
| FILBERT, EDWIN B. | Baltimore | Baltimore City |
| FLYNN, LEO G. | Seat Pleasant | Prince George's |
| FOX, ESTON F. | Hagerstown | Washington |
| GALLAHAN, JESSIE M. | Brandywine | Prince George's |
| GARDINER, MARY M. | Indian Head | Prince George's |
| GILMER, MARY K. | Elkridge | Howard |
| GLISAN, SARAH M. | Libertytown | Frederick |
| GRAY, EFFIE J. | Nanjemoy | Charles |
| GRAY, J. ALEXANDER | Brownsville | Washington |
| GRAY, SADIE L. | Nanjemoy | Charles |
| GREER, MARY M. | Brentland | Charles |
| GRIMES, MAYE E. | Woodbine | Carroll |
| GUYTHER, VERA | Piney Point | St. Mary's |
| HACKETT, LAVADA E. | Vienna | Dorchester |
| HAISLIN, ETTA L. | Welcome | Charles |
| HANCOCK, HUGH | Huddleston | Virginia |
| HAND, MARY E. | Berwyn | Prince George's |
| HARMAN, CLAUDIA V. | Marydel | Caroline |
| HARRISON, MAE A. | Budds' Creek | St. Mary's |
| HART, CECILIA M. | Oakland | Garrett |
| HARTMAN, SARAH A. | Middletown | Frederick |
| HIGGINS, SARAH E. | Lonaconing | Allegany |
| HILL, ELSIE M. | Cumberland | Allegany |
| HILL, JAMES H. | Hyattsville | Prince George's |
| HIRSCH, LEO | Baltimore | Baltimore City |

| *Name* | *Home* | *County or State.* |
|---|---|---|
| HOLLAND, ESTHER M. | Ridgely | Caroline |
| HOLTER, HELEN L. | Frederick | Frederick |
| HOUGHTON, MARGARET A. | Halethorpe | Baltimore |
| HUNT, LULA W. | Galloways | Anne Arundel |
| JOHNSON, ELLA. | Long | Allegany |
| JONES, ALICE (Mrs.) | Capitol Heights | Prince George's |
| JONES, ALLEN S. | Washington | District of Columbia |
| KEEFAUVER, LLOYD C. | Hampstead | Carroll |
| KEIM, HORACE G. | Berlin | Worcester |
| KELLER, MINNIE S. | Buckeystown | Frederick |
| KEPLER, MYRIE K. | Middletown | Frederick |
| KERBY, KATHERINE E. | Brandywine | Prince George's |
| KERSEY, SARAH E. | Chester | Queen Anne's |
| KEY, INA M. (Mrs.) | Hyattsville | Prince George's |
| KING, ESTELLE M. | Chestertown | Kent |
| KING, OLIVE E. | Tippett | Prince George's |
| KNIPPLE, JULIUS G. C. | Westminster | Carroll |
| LANHAM, MARY E. | Seat Pleasant | Prince George's |
| LAUTERBACH, MAYNARD F. | Baltimore | Baltimore City |
| LAWRENCE, SARAH | Capitol Heights | Prince George's |
| LOVE, ANNA M. | Morganza | St. Mary's |
| LOWE, MARY F. | Mt. Rainier | Prince George's |
| MCCALL, ELIZABETH L. | College Park | Prince George's |
| MCNAMARA, KATHERINE | Cumberland | Allegany |
| MAGGIO, LENA V. | Frederick | Frederick |
| MALONE, RUTH F. | College Park | Prince George's |
| MARKER, RUSSELL E. | Hagerstown | Washington |
| MARTIN, RUTH | Hughesville | Charles |
| MARTZ, GRACE S. | Frederick | Frederick |
| MATTHAEI, DOROTHEA E. | Cumberland | Allegany |
| MATZEN, A. S. (Mrs.) | Berwyn | Prince George's |
| MATZEN, BRODER A. | New Market | Frederick |
| MEALEY, HELEN L. | Chestertown | Kent |
| MEEKS, HOPE W. | Hagerstown | Washington |
| MELLOR, SIDNEY M. | Washington | District of Columbia |
| MENZEL, KURT F. | Frederick | Frederick |
| MICHAEL, ELIZABETH E. | Ijamsville | Frederick |
| MOORE, ADDIE M. | Station "H" | Prince George's |
| MOORE, BELLE | Station "H" | Prince George's |
| MORELAND, FANNIE ESTELLE. | Gallant Green | Charles |
| MORGAN, EDWIN KING. | Washington | District of Columbia |
| MORRIS, ALMA | Abell | St. Mary's |
| MORRIS, SADIE AGNES. | Abell | St. Mary's |
| MOXLEY, SADIE ELIZABETH. | Mt. Airy | Frederick |
| MULLINIX, MARGARET A. | Woodbine | Carroll |
| MURPHY, ANNA LOUISE. | Ijamsville | Frederick |
| MURPHY, JOSEPH DINSMORE. | Philadelphia | Pennsylvania |
| MURRAY, HARRIET LENORE. | Washington | District of Columbia |
| NELSON, DELIA BLANCHE. | Denton | Caroline |
| NORRIS, ANNA BYRD. | Fullerton | Baltimore |
| NORRIS, JANE EDITH. | Great Mills | St. Mary's |
| NOURSE, CLARENCE BOICE. | Alexandria | Virginia |

| *Name* | *Home* | *County or State.* |
|---|---|---|
| OHLER, MARY ROZELLA | Taneytown | Carroll |
| PADGETT, MYRTLE ISABEL | Station "H" | Prince George's |
| PARRAN, ETHEL HELLEN | Island Creek | Calvert |
| PATRICK, ETHEL DOROTHY | Woodbine | Howard |
| PATTERSON, WM. CALVIN | College Park | Prince George's |
| PEARCE, L. NELLIE | Rock Hall | Kent |
| PEDEN, VIRGINIA | Batesville | Arkansas |
| PEEL, MOLLIE | Lonaconing | Allegany |
| PINCH, THOMAS M | Glendale | Prince George's |
| PRICE, JAY SAMUEL | Snow Hill | L Worcester |
| PUMPHREY, ALICE LEE | Germantown | Montgomery |
| PUMPHREY, ESTHER | Germantown | Montgomery |
| QUEEN, MARIA CARMOLITA | Waldorf | Prince George's |
| RAEDY, MICHAEL LEO | Washington | District of Columbia |
| REDMOND, JOHN EDWARD | Frederick | Frederick |
| RISON, ELOISE VIRGINIA | Rison | L Charles |
| RITZEL, MARY ELIZABETH | Westover | Somerset |
| ROBEY, MARY LUCILE | Croome | Prince George's |
| ROBINSON, M. EDITH | Brightwood | District of Columbia |
| ROCKHOLD, M. EVANGELINE | Friendship | Anne Arundel |
| ROE, LULU WINNIEFRED | Denton | Caroline |
| ROE, MILDRED CHAROLETTE | Denton | Caroline |
| SEEGER, PAULINE RANDALL | Frederick | Frederick |
| SELBY, HATTIE IDELLA | Cheltenham | Prince George's |
| SHAFFER, HARRY HARRISON | Upperco | Baltimore |
| SHORT, MILDRED BELL | Lewistown | Frederick |
| SHORT, MARY | Meridian | Mississippi |
| SHORT, MYRTLE REBECCA | Vienna | Dorchester |
| SIBLEY, FRANCES IRENE | Germantown | Montgomery |
| SMITH, GRACE ELIZABETH | Marydel | Caroline |
| SNYDER, BERTIE IRENE | Taneytown | Carroll |
| SNYDER, LILLIE MAE | Taneytown | Carroll |
| SOPER, ELSIE MAY | Beltsville | Montgomery |
| SPECHT, BETTIE ANN | Tuscarora | Frederick |
| STEINLE, KATHRYN LOUISE | Washington | District of Columbia |
| STEUART, CAROLINE LOUISE | Mitchellville | Prince George's |
| STRAWBRIDGE, VIOLA | Fawn Grove | Harford |
| TEMPLETON, KATHERINE A | Cumberland | Allegany |
| THONSSEN, RUBY ELLA | Washington | District of Columbia |
| TRASK, HENRY SHERWOOD | Washington | District of Columbia |
| TRASK, MARION BOOTH | Washington | District of Columbia |
| TROXELL, THOMAS | Gaithersburg | Montgomery |
| UMHAN, KATHARINE SOPHIE | Washington | District of Columbia |
| VAN HORN, MARIE ADELE | Brentwood | Prince George's |
| WALTERS, JOSEPHINE ELIZ | Chestertown | Kent |
| WATSON, MARY ELLEN | Malcolm | Charles |
| WELCH, MARY MYRTLE | Ridge | St. Mary's |
| WHEAT, MYRA CONNELLY | Chestertown | Kent |
| WHITE, HELEN ELIZABETH | Baltimore | Baltimore City |
| WHITE, JAMES WILSON | Gaithersburg | Montgomery |
| WICKHAM, HELENA | Nottingham | Prince George's |
| WOLFE, ELMER A | Union Bridge | Carroll |

| *Name* | *Home* | *County or State.* |
|---|---|---|
| WOODEN, LOUIS ELIZABETH | Baltimore | Baltimore City |
| WYNKOOP, J. CARTWRIGHT | Washington | District of Columbia |
| WYVILL, RUTH CLEVELAND | Marlboro | Prince George's |
| YOUNKIN, HAZEL GEVIENE | Grantsville | Garrett |
| ZANTZINGER, Jr., OTWAY B. | Hyattsville | Prince George's |

**Summary of Student Enrollment at the Close of the Second Term, March 23, 1920**

| | |
|---|---|
| Graduate Students | 12 |
| Seniors | 42 |
| Juniors | 41 |
| Sophomores | 82 |
| Freshmen | 148 |
| Second Year Agricultural | 15 |
| Second Year Mechanic Arts | 4 |
| First Year Agricultural | 23 |
| First Year Mechanic Arts | 7 |
| Unclassified | 26 |
| Federal Board for Vocational Education (Rehabilitation) | 59 |
| Industrial Teachers' Training Course | 20 |
| Summer School | 201 |
| Total | 680 |
| Duplications | 25 |
| Total Net Enrollment | 655 |

# GENERAL INDEX

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