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NUMBER 9

# NEW YORK STATE COLLEGE OF AGRICULTURE ANNOUNCEMENT OF THE SUMMER TERM 1914

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# CALENDAR

# Summer Term

June 8,	Monday,	Registration of all students.
June 9,	Tuesday,	Instruction begins in all courses.
June 17.	Wednesday,	Forty-sixth Annual Commencement, Half holiday.
July 4,	Saturday,	Holiday.
Sept. 23.	Wednesday,	Instruction ends.

# Summer Session

July	6,	Monday,	Summer Session begins.
Aug.	14.	Friday,	Summer Session ends.

# Fall Term, 1914-15

Sept. 11,	Friday,	Entrance examinations begin.
Sept. 21-22,	Monday-Tuesday,	Registration of new students.
Sept. 23,	Wednesday,	Registration of old students.
Sept. 24.	Thursday,	Instruction begins.

# NEW YORK STATE COLLEGE OF AGRICULTURE

# FACULTY

Jacob Gould Schurman, A.M., D.Sc., LL.D., President of the University.

William Alonzo Stocking, jr., M.S.A., Acting Director of the College of Agriculture and Professor of Dairy Industry.

Isaac Phillips Roberts, M.Agr., Professor of Agriculture, Emeritus.

John Henry Comstock, B.S., Professor of Entomology and General Invertebrate Zoology.

Henry Hiram Wing, M.S. in Agr., Professor of Animal Husbandry.

Thomas Lyttleton Lyon, Ph.D., Professor of Soil Technology.

John Lemuel Stone, B.Agr., Professor of Farm Practice.

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George Nieman Lauman, B.S.A., Professor of Rural Economy.

Herbert Hice Whetzel, A.B., M.A., Professor of Plant Pathology.

Elmer O. Fippin, B.S.A., Professor of Soil Technology.

George Frederick Warren, Ph.D., Professor of Farm Management.

Charles Scoon Wilson, A.B., M.S.A., Professor of Pomology.

Charles Henry Tuck, A.B., Professor of Extension Teaching.

Albert Russell Mann, B.S.A., Secretary to the College of Agriculture, Registrar, and Professor of Agricultural Editing.

Wilford Murray Wilson, M.D., Professor of Meteorology.

Walter Mulford, B.S.A., F.E., Professor of Forestry.

James George Needham, Ph.D., Professor of General Biology, Limnology, and Nature Study.

Bryant Fleming, B.S.A., Professor of Landscape Art.

Harry Houser Love, Ph.D., Professor of Plant Breeding Investigations.

Arthur Witter Gilbert, Ph.D., Professor of Plant Breeding.

Donald Reddick, Ph.D., Professor of Plant Pathology.

Edward Gerrard Montgomery, M.A., Professor of Farm Crops.

—, Professor of Rural Education.

Flora Rose, B.S., M.A., Professor of Home Economics.

Martha Van Rensselaer, A.B., Professor of Home Economics.

William Albert Riley, Ph.D., Professor of Insect Morphology and Parasitology.

James Adrian Bizzell, Ph.D., Professor of Soil Technology.

Glenn Washington Herrick, B.S.A., Professor of Economic Entomology.

Howard Wait Riley, M.E., Professor of Farm Mechanics.

Harold Ellis Ross, M.S.A., Professor of Dairy Industry.

Hugh Charles Troy, B.S.A., Professor of Dairy Industry.

Samuel Newton Spring, B.A., M.F., Professor of Forestry.

Karl McKay Wiegand, Ph.D., Professor of Botany.

William Henry Chandler, B.S. in Agr., M.S. in Agr., Professor of Pomology Arthur Bernhard Recknagel, B.A., M.F., Professor of Forestry. Merritt Wesley Harper, M.S., Professor of Animal Husbandry.

Cyrus Richard Crosby, A.B., Extension Professor of Entomology.

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Alvin Casey Beal, Ph.D., Professor of Floriculture.

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Annette J. Warner, Assistant Professor of Design.

Arthur Lee Thompson, M.S. in Agr., Instructor and Investigator in Farm Management.

Royal Gilkey, B.S.A., Instructor in Extension Teaching, and Supervisor of Mailing Division and Reading Courses.

Anna Clegg Stryke, A.B., Instructor in Entomology.

John Thomas Lloyd, A.B., Instructor in Limnology.

Charles Truman Gregory, B.S. in Agr., Instructor in Plant Pathology

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Robert A. Jehle, M.S.A., Instructor in Plant Pathology.

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Arthur Johnson Eames, Ph.D., Instructor in Botany.

Cecil Calvert Thomas, A.B., M.A., Instructor in Botany.

Mrs. Maude Cipperly Wiegand, A.B., Instructor in Botany.

James Kenneth Wilson, B.S., Instructor and Investigator in Botany.

William J. Robbins, A.B., Instructor in Botany.

Otis F. Curtis, M.S., Instructor in Botany.

Elmer Eugene Barker, A.B., Instructor in Plant Breeding.

Louis Hamilton Moulton, Instructor in Farm Practice, and Farm Superintendent.

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Daniel Scott Fox, B.S., Instructor in Farm Management.

Roland Harrison Patch, Instructor in Floriculture.

Paul Work, A.B., M.S. in Agr., Superintendent of Department and Instructor in Vegetable Gardening.

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Albert Edmund Wilkinson, B.S., Extension Instructor in Vegetable Gardening.

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Horace Mann Pickerill, B.S. in Agr., Instructor in Dairy Industry.

Harvey Lyon Ayres, Extension Instructor in Dairy Industry.

Eugene Davis Montillon, B.Arch., Instructor in Landscape Art.

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Leslie Eugene Hazen, B.S. in Agr., Instructor in Farm Mechanics.

James Lewis Strahan, B.S. in Agr., M.S. in Agr., Instructor in Farm Mechanics.

L. Wayne Arny, B.S., Instructor and Investigator in Pomology.

Cass Ward Whitney, B.S., Instructor in Extension Teaching.

Royal J. Haskell, B.S., Instructor in Plant Pathology.

# Other Officers of Instruction and Administration

George Walter Tailby, jr., Superintendent in Animal Husbandry.

Carl Ilg, Assistant Curator in Entomology.

Ada Eljiva Georgia, Assistant in the Farm Course.

Richard Alan Mordoff, B.S. in Agr., Assistant Registrar.

Charles Paul Alexander, B.S., Assistant in the Farm Course.

Mary E. Hill, B.S., Assistant in Biology.

Emmeline Moore, M.A., Assistant in Biology

Alice Ayr Noyes, B.A., Assistant in Biology.

Wilbert A. Clemens, B.A., Assistant in Biology.

William Colcord Woods, A.B., Assistant in Biology.

Harry E. Vick, B.S., Assistant in Biology.

Ira Myron Hawley, B.A., Assistant in Economic Entomology.

Rowland Willis Leiby, B.S., Assistant in Insect Morphology,

Albert Francis Coutant, B.S., Assistant in Parasitology.

Edward A. Richmond, B.S., Assistant in the Farm Course.

Karl Patterson Schmidt, Assistant in the Farm Course. Gordon Ellwood Wightman, Assistant in the Farm Course. William George Frisbie, Assistant in the Farm Course.

Gerd Miller Wendelkin, B.A., Assistant in Systematic Entomology.

Willis Robert Fischer, Laboratory Assistant in Plant Pathology.

Agnes A. McAllister, Assistant in Plant Pathology.

Charles Chupp, A.B., Assistant in Plant Pathology.

William Edwin Keefer, Ph.M., Assistant in Forest Pathology.

Ralph Simpson Nanz, B.S., Assistant in Botany.

Ruth Southwick Rodman, B.A., Assistant in Botany.

Theodore Cook Davis, A.B., Assistant in Botany.

Franklin William Pettey, B.A., Assistant in Botany.

Laurence Howland MacDaniels, A.B., Assistant in Botany.

Franklin Post Metcalf, A.B., Assistant in Botany.

William Frederick Friedman, Assistant in Plant Breeding.

Allan Cameron Fraser, Assistant in Plant Breeding.

Ralph Waldo Green, Assistant in Plant Breeding.

Lua Alice Minns, Student Assistant in Floriculture.

Alfred Carl Hottes, B.S., Student Assistant in Floriculture.

Julia Zita Kelly, Secretary and Curator in Floriculture.

Charles Herbert Van Auken, Clerk and Accountant in Animal Husbandry.

Walter Gernet Krum, Assistant and Superintendent in Poultry Husbandry. Elizabeth Faith Genung, B.S. in Agr., Assistant in Dairy Industry.

George Cornell Supplee, B.S., Assistant in Dairy Industry.

Arthur Merle Besemer, B.S., Assistant in Dairy Industry.

Arthur Edward Potts, B.Sc., Assistant in Dairy Industry.

Charles Edward Hunn, Foreman of Grounds.

Andrew Jackson Lamoureux, Assistant in Library.

George Wilson Parker, Clerk.

Anna Elizabeth Hunn, B.S., Manager of Cafeteria.

Lucy Harriet Ashton, Assistant to the Registrar.

Emmons William Leland, B.S.A., Superintendent of Field Experiments in Soil Technology.

William Thomas Craig, Assistant in Plant Breeding.

Herbert W. Teeter, Superintendent of Garden (Plant Breeding).

Anna Mary Atwater, Laboratory Assistant in Plant Breeding.

Walton Isaac Fisher, Laboratory Assistant in Plant Breeding.

Mrs. Laura McLallen Van Auken, Clerk in Department of Dairy Industry.

# THE NEW YORK STATE COLLEGE OF AGRICULTURE SUMMER TERM

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The college year in Cornell University is divided into two terms, or semesters, extending from the last of September to the early part of June. It has been the desire of the Faculty of Agriculture for many years to have the College in operation the year round, so that the summer season, especially advantageous in the teaching of certain phases of agriculture, could be utilized. This desire is now realized by the establishment of a full summer term which is coordinate with the present fall and spring terms.

The primary purpose of the summer term is to take advantage of the growing season in teaching certain subjects to students regularly registered in either graduate or undergraduate courses. The facilities of the College are available for graduate study throughout the summer. In addition, opportunity is provided for advanced students, teachers, and others, who are otherwise engaged during the regular school year, to have the advantage of a long period of special instruction.

In view of the fact that the introduction of the new term affects the organization of the entire college year, it will be possible in the summer of 1914 to offer only a limited number of courses. After the present year, when the readjustments will have been made, it is expected that courses will be given by most of the departments. A sufficient number of courses are offered for the present summer, however, so that students will have considerable choice in arranging their schedules.

Registration for the summer term will take place on June 8, 1914, between the hours of 9 a.m. and 4 p.m. All students are expected to register first at the office of the University Registrar in Morrill Hall. They will then present themselves at the office of the Secretary of the College of Agriculture, room 122, Main building, for further registration and arrangement of schedules. Instruction will begin at 8 a.m. on June 9. The summer term will close at 5 p.m. on September 23. No classes will be held on the forenoon of Commencement day, June 17, or on July 4.

The requirements for admission to the summer term are stated on page 11.

# THE COLLEGE OF AGRICULTURE

Cornell University is composed of eight colleges and the Graduate School. One of these colleges is the College of Agriculture.

Cornell University was chartered by the Legislature in 1865, being founded on the Land Grant Act of 1862. By the terms of the Land Grant Act, teaching in agriculture has been from the first a regular part of the University enterprise. In other states the state government has made appropriations to supplement the work in agriculture. In 1904 the Legislature of the State of New York made an appropriation of \$250,000 for the erection of buildings for the College of Agriculture at Cornell University, and established the College as a state institution under the title "The New York State College of Agriculture at Cornell University." Before this time the State had established at Cornell University "The New

York State Veterinary College." In 1906 the Legislature passed an Administration Act defining the purpose and activities of the College of Agriculture thus: "The object of the said college of agriculture shall be to improve the agricultural methods of the state; to develop the agricultural resources of the state in the production of crops of all kinds, in the rearing and breeding of live-stock, in the manufacture of dairy and other products, in determining better methods of handling and marketing such products, and in other ways; and to increase intelligence and elevate the standards of living in the rural districts. For the attainment of these objects the college is authorized to give instruction in the sciences, arts, and practices relating thereto, in such cases and in such manner as shall best serve the interests of the state: to conduct extension work in disseminating agricultural knowledge throughout the state by means of experiments and demonstrations on farms and gardens, investigations of the economic and social status of agriculture, lectures, publications of bulletins and reports, and in such other ways as may be deemed advisable in the furtherance of the aforesaid objects; to make researches in the physical, chemical, biological, and other problems of agriculture, the application of such investigations to the agriculture of New York, and the publication of the results thereof."

# THE BUILDINGS AND FARMS

The buildings erected under the enactment of 1904 were first occupied in June, 1907. Subsequently the Legislature provided for the erection of two large barns, greenhouses, a home economics building, a poultry husbandry building, and an auditorium, all of which are now fully in use. Appropriations have been made also for the extension of the greenhouse range, the construction of two animal husbandry buildings, a forestry building, an agronomy building, additional barns, a rural schoolhouse, buildings for fowls in the Department of Poultry Husbandry, and a general heating plant for the College of Agriculture. These buildings are now under construction or under plan. It is expected that the forestry, poultry, and animal husbandry buildings will be in use during the summer term of 1914.

Other smaller buildings included in the present equipment are a frame building that temporarily houses the Department of Rural Engineering, a rural school-house that serves as the headquarters for the Department of Rural School Education, an insectary, a biological station in the marsh at the south end of Cayuga Lake, a fish breeding house in Cascadilla Creek, a seed storage house, and other small buildings on the farms.

The Farms. The College of Agriculture has 766 acres of land and it rents 150 acres additional, making a total of 916 acres under college management. These farms are run not for commercial but for educational purposes, and the practices are therefore modified to meet the varied demands of the institution.

Land in the vicinity of the College is very broken, abounding in hills and dales, brooks and gorges. In consequence, less than one half of the total area is now available for tillage. Of the 916 acres, 508 are classified as arable, 188 as pasture, and 133 as wood and waste, 48 are devoted to college grounds, buildings, and old orchards, and 39 are retained for other uses.

Of the tillable area, 45 acres have been laid out in permanent experiment plots for the use of the Departments of Soil Technology and Plant Breeding; 50 acres have been assigned to the Department of Pomology and are largely planted to young trees; 45 acres have been assigned to the Departments of Floriculture and Vegetable Gardening; 73 acres to the Department of Poultry Husbandry; 9 acres to farm-crop gardens and experiments; and there are left to the Departments of Farm Practice and Farm Crops 286 acres on which the regular farm operations may be conducted.

The soil of the college farms is heavy, nearly all of it being Dunkirk clay loam. A few fields at the extreme southeastern corner are Volusia stony loam. The Dunkirk clay loam is entirely unsuited to potatoes and is not well adapted to corn, but will grow fair crops of corn if heavily manured. It is well adapted to wheat, oats, timothy, and clover. The Volusia stony loam when well drained and freed from stones is well adapted to corn and potatoes. The recently acquired areas lack both these improvements.

## EXPENSES

Tuition in the College of Agriculture is free to both graduate and undergraduate students who for a year or more immediately preceding matriculation have been residents of the State of New York. The annual tuition fee for students from outside the State is \$125 for two terms. The tuition fee for the summer term is \$62.50.

Other fees, required of all students, are as follows:

Matriculation fee	
Fee for baccalaureate degree	10.00

Deposit fees are required in various laboratory courses; inquiry concerning these should be made before registration. Students are liable to a special charge for breakage or damage resulting from their own carelessness. Attention is called to the expenses of excursions required in various courses.

The expenses for textbooks, instruments, and other necessary articles varies from \$10 to \$75 a year.

There are many private boarding and rooming houses near the University campus. In these the cost of board and furnished room, with heat and light, varies from \$5 to \$12 a week. By the formation of clubs, students are sometimes able to reduce their expenses for room and board.

# HONOR SYSTEM

With the consent of the faculty, examinations for agricultural students are conducted under the honor system, which is administered by a Committee on Student Honor. Every new student should acquaint himself at once with the regulations imposed by the honor system, copies of which are available at the office of the Secretary of the College.

# GENERAL INFORMATION CONCERNING COURSES

The regular instruction in the College of Agriculture constitutes a course of four years, or eight terms, leading to the degree of Bachelor of Science. There is a combined course with the State Veterinary College comprising six years and leading to two baccalaureate degrees. Summer courses in agriculture, designed especially for teachers, school principals and superintendents, and college students, are offered in the six-weeks Summer Session of the University. Aside from these there are winter courses without University credit, and opportunities for students to pursue special work. Circulars describing the winter courses and the short summer courses may be obtained on application to the Secretary.

Students may pursue agricultural subjects in the Graduate School of the University. For full information concerning graduate work and degrees, see the Announcement of the Graduate School.

# THE REGULAR FOUR-YEARS COURSE

Men who are candidates for admission to the regular, or four-years course must be at least sixteen years of age; women must be at least seventeen years of age. They must have certificates of good moral character, and students from other colleges or universities are required to furnish from those institutions certificates of honorable dismissal. Students are admitted on examination, or on presenting credentials of the Education Department of the State of New York, or on acceptable school certificates.

Prospective students who have neither lived on farms nor had considerable practical experience in agriculture are urged to spend at least one year on a well-managed farm in order to familiarize themselves with common farm affairs and operations before entering the College. This experience is imperative in order to pass the farm-practice requirements.

Candidates for admission must file their credentials and obtain permits for examination at the University Registrar's office, Morrill 10. The results of examination may be ascertained from the Registrar.

# Entrance Requirements of Four-Years Course

The subjects that may be offered for admission are named in the following list; the figure in parenthesis following each subject indicates its value in units and shows the maximum and the minimum amount of credit allowed in the subject. A unit represents five recitations a week for one year in a study.

1a. English A	(2)	8a. Ancient History (1/2-1)
1b. English B	(1)	8b. Modern History (½-1)
2a. First Year Greek	(1)	8c. Am. History, Civics (1/2-1)
2b. Second Year Greek	(1)	8d. English History (1/2-1)
2c. Third Year Greek	(1)	9a. Elementary Algebra (1)
3a. First Year Latin	(1)	9b. Intermediate Algebra (½)
3b. Second Year Latin	(1)	9c. Advanced Algebra (1/2)
3c. Third Year Latin	(1)	9d. Plane Geometry (1)
3d. Fourth Year Latin	(1)	9e. Solid Geometry (½)
4a. First Year German	(1)	9f. Plane Trigonometry (½)
4b. Second Year German	(1)	9g. Spher. Trigonometry (½)
4c. Third Year German	(1)	10. Physics (1)
5a. First Year French	(1)	II. Chemistry(1)
5b. Second Year French	(1)	12. Physical Geography (½-1)
5c. Third Year French	(1)	13. Biology* (1)

<sup>\*</sup>If an applicant has counted Biology (1) he may not offer also Botany (1/2) or Zoology (1/2),

6a.	First Year Spanish	(1)	14.	Botany* (½-r)
6b.	Second Year Spanish	(1)	15.	Zoology* (½-1)
6c.	Third Year Spanish	(1)	16.	Agriculture (½-1)
7a.	First Year Italian	(1)	17.	Drawing (½-1)
7b.	Second Year Italian	(1)	18.	Manual Training (r)
7c.	Third Year Italian	(1)	19.	Any high school subject or
				subjects not already used(1/2-1)

For admission to the New York State College of Agriculture, an applicant must offer either A or B as below:

A. Fifteen units arranged as follows: English (3), history (1), elementary algebra A (1), plane geometry (1), a foreign language\*\* (3), elective (6). Solid geometry and plane trigonometry are recommended among the elective units for students entering the courses of forestry or landscape art.

B. The Arts College Entrance Diploma or the Science College Entrance Diploma issued by the Education Department of the State of New York.

# Requirements for Admission of Special Students

Opportunities are provided for persons who desire to pursue special studies. In order to be eligible for admission to special work, applicants must offer two full years of recent farm experience and must also either have fifteen units of entrance credits or be twenty-one years of age. Applicants for admission on the age requirement must satisfy the faculty of their ability to handle the work; and every applicant must satisfy the faculty of his bona fide desire for special study. He will be required to present an honorable dismissal from the school last attended, certificates of good moral character, and such other certificates and letters as may be desired. The special work is designed to meet the needs of young men and young women from farms who have not time for a four-years course, and of mature persons who desire to spend a brief period in specialized study. The work is not a definite "course" in the sense of having a program or a prescribed set of studies. The student chooses any of the agricultural "electives" that he is fitted to pursue. Certain courses are given by some of the departments for students who lack some of the fundamental work usually required in those subjects. Admission as a special student does not admit to classes. The student is admitted to the various classes by the heads of the departments concerned.

# Requirements for Admission to the Summer Term

Applicants for admission to the summer term as regular students in the fouryears college course must, in addition to satisfying entrance requirements in full, have completed all the required work of the first two years of the regular course as outlined on page 13, or the substantial equivalent thereof. Special students are admitted to the summer term on the same basis as to other terms, as recited above.

<sup>\*</sup>If an applicant has counted Biology (1) he may not offer also Botany (34) or Zoology (34).

\*\*Prench or German is recommended for entrance. For the Graduate School requirement with reference to a reading knowledge of French and German, see page 5 of the Announcement of the Graduate School.

# Other Details of Admission

For other details as to subjects and methods of admission, see the General Circular of Information, which may be obtained on application to the Secretary, Cornell University, Ithaca, New York.

For admission to advanced standing from other colleges and universities, all communications should be addressed to the Registrar of the University. See the General Circular of Information.

For admission as a special student, communications should be addressed to the Secretary, College of Agriculture, and attention is called to the paragraphs on pages 26 and 27 of the General Circular of Information.

For admission to graduate work and candidacy for advanced degrees, communications should be addressed to the Dean of the Graduate School.

# Requirements for the Degree of Bachelor of Science

The requirements for the degree of Bachelor of Science shall be residence for eight terms, and, in addition to the prescribed work in the Department of Physical Culture and of Military Science and Tactics, the completion of one hundred and twenty hours of required and elective work as outlined on pages 13 and 14.

A student admitted to the College of Agriculture from another college in Cornell University, or from any other institution of collegiate rank, will be regarded as having completed the number of terms and hours to which his records entitle him, and will receive all the privileges of students who have completed the same number of terms and hours by residence in the College. In order, however, to obtain the degree of Bachelor of Science, he must have completed the prescribed subjects in the four-years course and the requisite number of elective hours in agricultural subjects. He must also have been in residence in the College of Agriculture for at least two consecutive terms and have completed not less than fifteen hours a term, of which two-thirds, at least, must be subjects taught by the staff of the College of Agriculture.

A student must register for at least twelve hours each term and no new student may register for more than eighteen hours. Maximum registration by old students is determined on the basis of record.

All men students, except those whose record and registration at the beginning of the senior year show that they are specializing to the extent of fifteen hours in home economics, forestry, landscape art, entomology, or plant breeding, must fully satisfy, before the beginning of the senior year, the requirements in farm practice. All men students are required to report to the Department of Farm Practice within the first three weeks of the first term in the College.

Regular students may take at their discretion during their four years not to exceed twenty hours of elective subjects in courses offered in other colleges than Agriculture; but such elective subjects shall not interfere with required or back work. Special students must take at least two-thirds of the entire work of each year from subjects taught by members of the staff of Agriculture.

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Freshman year	Number of course	Hours 1st term	Hours 2d term
English	I	4	4
Chemistry	I	6	-
Chemistry 85	or 6		4 or 5
Biology	1	3	3
The Farm	2444	2.,.,	-
Physics	2		5
Electives*		0-3	0-2
			-
Total	1,	5-18	16-18
Sophomore year	Number of course	Hours 1st term	Hours 2d term
Geology**	I	3	+
Chemistry†85,	85a	(2)	6

Botany	1	3	3
or Zoology	I	5	-
Electives		-12	6-12
Total	1	5-18	15-18
In addition to the above, the required work in	military	drill and	physical

In addition to the above, the required work in military drill and physical training must be taken.

Political Science 51 may be taken during this year.

Physiology, t one of the following:

Physiology of domestic animals.....

Human physiology .....

Junior year			Hours 1st term	
Political	Science	51	3	3

# Elective Subjects and Group Requirements

The remainder of the work is made up of electives to be taken under the following restrictions:

A student may take at his discretion during his four years not to exceed twenty hours of elective subjects in courses offered in other colleges than Agriculture; but such elective subjects shall not interfere with required or back work. The remainder of his elective work must be offered from subjects taught by members of the staff of Agriculture.

In selecting the subjects in the major group in Agriculture, the student must

<sup>\*</sup>Professional students in forestry who do not offer solid geometry and plane trigonometry for entrance are required to take these subjects in their freshman year.

<sup>\*\*</sup>Optional for students taking a major in home economics.
†Required of students taking Chemistry 6 in the freshman year. The laboratory work, 85a, may be taken during the first term, leaving the four-hours lecture course for the second term.
Students who do not take Chemistry 6 cannot take 85a.

<sup>\$</sup>May be taken in junior or senior year by special permission.

obtain the advice and approval of a professor or an assistant professor having charge of a subject within the group and preferably within the department in which he expects to specialize, who shall be chosen by the student at the beginning of the sophomore year. Students expecting to specialize in forestry, landscape art, or home economics must take as their advisers professors or assistant professors in those departments.

All students must have passed before graduation at least fifteen hours of agricultural electives in one of the groups named below, and at least three hours in

each of three of the other groups:

Group A—Farm Crops

Pomology

Soil Technology

Floriculture

Vegetable Gardening

Group B-Animal Husbandry

Poultry Husbandry

Dairy Industry

Entomology

Group C-Agricultural Chemistry

Botany

Plant Breeding

Plant Pathology

Meteorology

Group D-Rural Economy

Farm Management

Extension

Rural Engineering

Drawing

Group E-Forestry

Home Economics

Landscape Art

# DEPARTMENTS OF INSTRUCTION BOTANY

6a. Taxonomy of the Higher Plants. Credit, five hours. Prerequisite Botany I or its equivalent. M W F, 8-I. Botanical Laboratory, Agronomy Building. Professor Wiegand and Mr.

Identification, classification, and ecology of seed plants and ferns: a detailed study of the local flora about Ithaca, with reference to the recognition of species and varieties, to the classification and scientific nomenclature of these forms, and to their floral and foliar characteristics. The course consists largely of field and laboratory work, but is supplemented by general discussions and lectures on the broader questions of classification, nomenclature, distribution, and habitat. The ecological associations and modifications of the various species and varieties will be noted. Instruction will be given in the preparation of an herbarium and in the preparation of keys.

Students are urged to take this course rather than the corresponding course given during the fall term. Work on the flora can be prosecuted with much greater success during the summer, when fresh plants are to be obtained. The situation of Ithaca is ideal for this work because of the very rich and varied nature of the flora, which renders an unusual variety of forms and conditions quickly accessible. The period of time covered by the course (June to September) renders almost the whole summer flora available for study. Some of the field trips will lead into rough country, and suitable clothing should be provided. Women will frequently find the bloomer costume convenient. Laboratory fee, \$1.

- 18. Research in Histology, General Botany, and Taxonomic Botany. Open only to graduate students. Professor Wiegand.
- 19. Seminar. The graduate students registered during the summer term will meet, at times to be arranged, for the discussion of current problems. Professor Wiegand.
- 21a. Advanced Plant Physiology. Credit, four hours. Prerequisite training in botany and chemistry, to be determined in each case by the instructor. Lectures, M W, 8. Agronomy Building 192. Laboratory, M W, 10-12.30. Assistant Professor Knudson and Mr. Nanz.

Topics include nutrition, osmotic pressure, permeability, absorption, conduction, transpiration, toxicity, and photosynthesis. Laboratory fee, \$6.

21b. Advanced Plant Physiology. Credit, four hours. Prerequisites as above. Lectures, T Th, 8. Agronomy Building 192. Laboratory, T Th, 10–12.30. Assistant Professor Knudson and Mr. Nanz.

Topics include metabolic products, digestion, translocation, respiration, fermentation, growth, stimulation, reproduction, and plant response. Laboratory fee, \$6.

These two courses are the equivalent of course 21, the credit for which is four hours in both fall and spring terms. The present division into two courses is arbitrary, one course representing the work of the fall term and the other representing that of the spring term. These courses are designed primarily for advanced or graduate students, and especially for those specializing in plant study. Lectures and laboratory work are supplemented by written reports. Students may take 21a and 21b simultaneously, or either may be taken alone.

- 31. General Seminar in Plant Physiology. Credit, one hour. Time and place to be arranged. Assistant Professor Knubson.
- 33. Research in General Physiology. Credit for major or minor, otherwise not less than four hours a term. Prerequisite adequate training in botany, chemistry, and physiology. Hours by appointment. Assistant Professor Knudson.

#### DAIRY INDUSTRY

1. Milk Composition and Tests. (To be given if at least five students register for the course.) Credit, three hours. For regular students only. Lectures, T, 11. Recitations, Th, 11. Dairy building 222. Laboratory, T, 2-4.30. Dairy Building 232. Professor Troy and Mr. Iones.

The topics considered are secretion and composition of milk, sampling, lactometer, Babcock test for fat, acid tests, salt tests, moisture tests, preservative tests. Laboratory deposit, \$3, part returnable.

Advanced Testing. Credit, two hours. Must be preceded by course 1.
 Laboratory course, M, 10-1, Th, 2-5. Dairy Building 202. Professor Trov and Mr. Jones.

The work considers such subjects as the determination of moisture and dry matter in dairy products, commercial test for casein, Babcock test for butter and oleomargarine, tests for preservatives and adulterations, milk modification. Laboratory deposit, \$2, part returnable.

This course will not be given unless there is a registration of at least twelve students; more than fifteen students cannot be accommodated.

# ENTOMOLOGY, BIOLOGY, AND NATURE STUDY Entomology

[1. The Ecology of Insects. Credit, three hours. One lecture and two practical exercises. Professor Needham.] Not given in 1914.

A general course in the study of the lives of insects in relation to their environment; mainly field work. Practical studies will be made of the activities of insects and of the rôle that they play in different natural associations. Observations will be made on the relations between their structures and instincts and the situations in which they live, and on many of the ways in which they find a living and establish homes.

3. General Entomology. Credit, three hours. Prerequisite Biology 1 or Zoology 1. Lectures, daily except S, 8, July 6 to August 14. Miss Stryke. Practical exercises, two afternoons by appointment, 2-4.30, July 6 to August 14. Miss Stryke and Mr. Coutant. Main Building 392.

Lectures on the characteristics of orders, suborders, and the more important families, and on the habits of representative species. The practical exercises include a study of the structure of insects and practice in their classification. The lectures only (credit two hours) are taken by those who have had or are taking courses 4 and 5. Laboratory fee, \$3.

- 4. Elementary Morphology of Insects. Credit, three hours. Laboratory open daily except S, 8-5. Main Building 391. Miss Strkke and Mr. Coutant. An introductory laboratory course required of all students who plan to do advanced work in entomology. Laboratory fee, \$2.
- 5. Elementary Systematic Entomology. Credit, two hours. Must be preceded or accompanied by course 4. Laboratory open daily except S, 8–5. Main Building 391. Miss Stryke and Mr. Coutant.

Practice in the identification of insects, and in the method of phylogenetic study as illustrated by their wing venation. With course 4, required of all students who plan to do advanced work in entomology. Laboratory fee, \$3.

11. Morphology and Classification of the Arachnida. Credit, three or more hours. Lectures, laboratory work, and field work by appointment. Miss Stryke.

There are exceptional opportunities about Ithaca for obtaining representative Arachnida; students electing this work will be expected to collect their own material. The department cannot undertake to furnish specimens for classification.

- 20. Morphology and Development of Insects. Credit, two hours. Prerequisite courses 3, 4, and 5. Lectures, W F, 9. Laboratory work to accompany or follow this course is offered under course 21. Main Building 392. Professor W. A. RILEY.
- 21. Histology of Insects. Credit, three or more hours. Prerequisite courses 3, 4, and 5. Laboratory open daily except S, 8-5. Main Building 391. Professor W. A. RILEY.

A laboratory course to accompany or follow the first term of course 20. Laboratory fee, \$1.50 an hour.

29. Research in Morphology of Insects. Credit, three or more hours. Prerequisite courses 3, 4, and 5. Laboratory open daily except S, 8-5, S, 8-1. Main Building 391. Professor W. A. RILEY.

Special work arranged with reference to the needs and attainments of each student. Laboratory fee, \$1.50 an hour.

31. Relations of Insects to Disease. Credit, two hours. Prerequisite first term of course 3 or 30. Lectures, M, 9. Main Building 392. Practical exercises, sec. 1, M, 2-4.30; sec. 2, T, 2-4.30. Professor W. A. RILEY.

Causation and transmission of disease by insects and other arthropods. Laboratory fee, \$2.

[40. Advanced Economic Entomology and Insectary Methods. Credit, two hours. Open only to graduates. Seminar, T, 2-4.30. Field and laboratory work by appointment. Professor——...] Not given in 1914.

Economic problems connected with applied entomology will be discussed and reported on, and field observations will be made. Experimental methods in breeding, photographing, investigating, and controlling insects will be discussed and studied. Designed for advanced students in entomology who desire to fit themselves for experiment station work. Laboratory fee, \$2.50.

- [49. Research in Economic Entomology. Credit, three or more hours. Prerequisite courses 3, 4, and 5. Laboratory and field work by appointment. Insectary. Professor——.] Not given in 1914.
- 50. General Limnology. Credit, four hours. Open only to students who have taken or are taking course 3 and Biology 1 or equivalent courses. Lectures, T Th, 10. Main Building 392. Laboratory by appointment. Mr. LLOYD.
- 59. Research in Limnology. Credit, three or more hours. Prerequisite course 50 or its equivalent. Laboratory and field work by appointment. Main Building 492 and Biological Field Station. Professor W. A. RILEY and Mr. LLOYD.

Seminar. M, 4.30-5.30. Main Building 392.

The work of an entomological seminar is conducted by the Jugatae, an entomological club that meets for the discussion of current literature and of the results of investigations. Attendance at the meetings may be counted as laboratory work.

#### FLORICULTURE

3. Commercial Floriculture. Credit, three hours. Prerequisite course 1 or commercial experience; and students are advised to take course 2 before entering this course. Lectures and recitations, W F, 9. Main Building 232. Practice, W, 2-4.30. New greenhouses. Professor White and Mr. Patch.

This course will include lectures, laboratory exercises, and assigned readings on the propagation and culture of the leading floricultural crops. As facilities permit, students will be assigned space in the greenhouses for practical experience in the growing of roses, carnations, chrysanthemums, violets, and plants of like character. During the summer term, training will be given in the field culture of these and other florists' flowers. Laboratory fee, \$2.

5. Greenhouse and Garden Practice. Credit, one or two hours. Prerequisite course 1 and permission to register. Practice by appointment. New greenhouses and gardens. Professor White, Mr. Patch, and greenhouse assistants.

Designed to give the student added practical knowledge of greenhouse and garden work. The course includes practice work in all lines of indoor and outdoor flower growing. Weekly reports are assigned.

9. Garden Flowers. Credit, three hours. Lectures, MW, 9. Main Building 232. Practice, T or Th, 2-4.30. New greenhouses and gardens. Mr. Hottes and Miss Minns.

This course is designed to follow course 8 and to acquaint the student with the value of all annual herbaceous perennial plants, their character, and their culture. Members of the class will be assigned the care of certain flower beds planted earlier in the season. Lectures will be held out of doors whenever the weather will permit. All members of the class will participate in an excursion to the Thompson Estate at Canandaigua on August 15. Laboratory fee, \$2.

10. Amateur Floriculture. Credit, one hour a term. Lectures and practice, S, 10.30-1. New greenhouses and gardens. Miss Minns.

The propagation and culture of plants suitable for window gardens and dooryards, including a study of containers, soils, fertilizers, insecticides; also, preparation and planting of flower beds. The work will be so arranged that the student may follow the development of plants from seed or cutting to maturity. Laboratory fee, \$1 a term.

11. Investigation in Floriculture. Credit, one, two, or three hours a term. Prerequisite courses 1, 3, and 4, and permission to register. Professors White and REAL

Designed primarily for upperclassmen and graduate students. Consultation by appointment. The investigation of problems in growing cut flowers, exotics, garden flowers, and the like.

12. Seminar. Credit, one hour a term. Required of advanced students who elect course 11, and of all graduate students. Th, 4.35-5.45. Main Building 232. Professor White and members of the staff.

# PLANT BREEDING

6 Plant Breeding. Credit, three hours, Prerequisite Biology 1, and Botany 1 or Zoology 1. Lectures, T Th, 12. Laboratory, S, 8-10.30. Forestry Building. Professor Gilbert.

A general elementary course designed to give the principles of plant breeding. The course consists of lectures, recitations, and field practice. Course 6 is similar to courses 1 and 2 combined, and it is offered during the summer when more and better material is at hand for instructional purposes. Laboratory fee, \$3.

13. Advanced Plant Breeding. Credit, three hours. Prerequisite course 3. Lectures, W F, 10. Laboratory, F, 2-4.30. Forestry Building. Professor Gilbert.

Conferences on and field practice in advanced principles and methods of breeding. Laboratory fee, \$3.

16. Research. Special work for a few advanced graduate students, arranged with reference to individual aims and attainments. By appointment. Agronomy building 311. Members of the departmental staff.

Problems in plant breeding, heredity, and general evolution. (For requirements and directions, see the pamphlet issued by the department.)

# PLANT PATHOLOGY

1. Plant Pathology. Credit, three hours. Prerequisite Botany 1 or its equivalent. Recitations, F, 12. Auditorium. Practice, W F, 2-4.30. (If registration warrants, another practice section will be offered, Th. 2-4.30, S, 8-10.30.) Auditorium, west basement. Mr. Hesler and Mr. Weimer.

A fundamental course treating of the common diseases of cultivated crops, their nature, cause, and control. A prerequisite for all other courses in plant pathology. Laboratory fee, \$4.50; breakage deposit, \$2.

[2. Principles of the Control of Plant Diseases. Credit, three hours. Prerequisite course 1.] Not offered in 1914.

A consideration of methods for the control of plant diseases, including sanitation, seed treatment, seed selection, spraying, tree surgery, immunization, preservation of timber, and the like. Laboratory fee, \$4.50; breakage deposit, \$2.

6. Mycology. Credit, three hours. Prerequisite course 1 or its equivalent. Lectures, M, 12. Auditorium. Practice, M T, 2-4.30. Auditorium, west basement. Mr. Hesler and Mr. Weimer.

A synoptical course intended to acquaint the student with the general field of mycology. Laboratory fee, \$4.50; breakage deposit, \$2.

20. Research. Not less than three hours. Professors Whetzel and Reddick, and Assistant Professors Barrus, Fitzpatrick, and Stewart.

Original investigation of problems in plant pathology. Laboratory fee, \$1.50 an hour.

#### POMOLOGY

1. Elementary Pomology. Credit, three hours. Prerequisite Biology 1 or Botany 1. Lectures, T Th, 11. Recitations, F, 11. Main Building 232. Mr. Arny.

A study of the methods of propagation and early care of commercial fruits, including the growing of seedlings, cuttings, and layers; the principles of budding, grafting, pruning, and planting; soils, varieties, and planting plans for the orchard. (See course Ia.)

1a. Elementary Pomology. Credit, one hour. Prerequisite Biology I or Botany I. Required of students taking the advanced courses in pomology. Laboratory course to follow course I. M, 2-4.30. Main Building 202. Messrs. ROGERS and PECK.

Practical exercises in budding, grafting, pruning, and planting; a study of varieties, nursery trees, and fruit buds. Laboratory fee, \$2.

19. Research in Pomology. Credit, one or more hours. Prerequisite courses 1, 1a, 2, 8, and sufficient training in chemistry, plant physiology, plant pathology, and entomology. F, 9. Main Building 202. Professor Chandler.

Original investigation of problems in pomology. A typewritten and bound

thesis is required.

# POULTRY HUSBANDRY

Feeding and Care. Credit, one hour. Practice, three short periods a day, including Sunday, for four weeks beginning July 8; morning, 7.45-8.30; noon, 12.45-1.15; night, 4.30-5. Poultry plant. Professor RICE and Mr.

Record keeping, and management of fowls for egg production and for fattening, including preparation for market. Reading will be required and a written examination will be held.

3. Incubator Practice. Credit, one hour. Must be preceded or accompanied by course 1, 1a, or 10. Practice, three short periods a day, including Sunday, for four weeks beginning July 8: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Professor RICE and Mr. ———.

Practice in operating incubators, testing eggs, keeping records, and taking apart and setting up machines. Reading will be required and a written examina-

tion will be held.

3a. Brooder Practice. Credit, one hour. Must be preceded or accompanied by course 1, 1a, or 10. Practice, three short periods a day, including Sunday, for four weeks beginning July 8: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Professor RICE and Mr. ——.

The management of a brooder and a flock of chickens; the keeping of temperature, food, and growth records. Reading will be required and a written examina-

tion will be held.

10. Farm Poultry. Credit, three hours. Lectures, M W, 11. Poultry Building 375. Professor RICE. Practice, M, 2-4.30. Poultry building 300. Mr. KENT.

An elementary course covering briefly the general field of poultry husbandry; primarily for persons who expect to make poultry keeping a minor part of farming.

Seminar. Credit, one to three hours a term. Prerequisite courses 1 or 1a and 2 and 3; must be preceded or accompanied by courses 4, 5, 7, and 8; can best be taken in the last year by special students and in the junior or senior year by regular students. Recitations and conferences by appointment. Poultry Building. Professor Rice, and Messrs. Benjamin and Kent.

12. Research. Credit, one to three hours a term. Prerequisite courses 1 or 1a, and 2 and 3; must be preceded or accompanied by courses 4, 5, 7, 8, and 11. By appointment. Poultry Building. Professor RICE and Mr. BENJAMIN.

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An original investigation of a problem in poultry husbandry, to be presented as a written thesis.

# RURAL ENGINEERING

Farm Mechanics. Credit, three hours. Students are urged to take Drawing 1 in preparation for this course. Lectures, W F, 8. Animal Husbandry Building 112. Laboratory, F. 2-4.30. Rural Engineering Building. Mr. HAZEN.

A study of the principles of operation, the details of construction, and the practical operation and care of: a—machinery, including gasoline engines, devices for transmitting power, hydraulic rams, pumps, water-supply outfits; b—implements, including plows and binder attachments, with a discussion of the special mechanical features of some of these implements now on the market. Laboratory fee, \$2.

20. Farm Engineering. Credit, three hours. Prerequisite plane geometry; students are urged to take Drawing 1 in preparation for this course. Lectures, T Th, 10. Animal Husbandry Building 112. Laboratory, W, 2-4.30. Rural Engineering Building. Mr. Strahan.

A study of the practical solution of the elementary problems involved in connection with surveying and mapping the farm; leveling and estimating for drains; laying out building foundations and farm water-supply and sewage-disposal systems. From the data obtained in the field a contour map will be drawn for one of the fields near the college buildings. Attention will be given also to concrete construction, the design of simple structures, and estimates of their cost. Laboratory fee, \$1.

30. Farm Structures. Credit, three hours. Prerequisite Drawing 1 or its equivalent. Lectures, T Th, 12. Animal Husbandry Building 112. Laboratory, S, 8–10.30. Dairy Building 119. Mr. HAZEN.

A study of building materials used on the farm; the principles of construction for barns, stables, and other farm buildings, and their application in practice.

# SOIL TECHNOLOGY

1. Principles of Soil Management. Credit, three hours. Prerequisite Chemistry 1 and Geology 1. Lectures, T Th, 9. Home Economics Building 100. Laboratory, one period, 2-4.30. Agronomy Building 42. Students must consult Professor Buckman before choosing laboratory period. Assistant Professor Buckman.

A comprehensive course dealing with the origin, composition, and properties of soils, with particular reference to their management in crop production. The laboratories will consist of practice designed to demonstrate fundamental physical relations, and will be supplemented by laboratory lectures. Laboratory deposit, \$3.

# VEGETABLE GARDENING

5. Systematic Vegetable Crops. Credit, three hours. Prerequisite course 3, or, in special cases, course 2 with permission to register. Lectures, Th, 8. Home Economics Building 370. Laboratory, Th, 2-4.30; S, 8-10.30. Vegetable head-house. Messrs. Work and Dimon.

Lectures and descriptive studies dealing with vegetable crops, their origin and botany. Special attention will be given to varieties and their adaptation to different cultural and market conditions. The important commercial types of different vegetables are grown in the garden each year, and there is an abundance of first-hand material for the course. Each student will make special systematic study of a crop or a group of crops, and will present a report in typewritten form.

 Practice. Credit, one or two hours. Prerequisite permission to register. By appointment. Mr. Work.

Opportunity will be offered for a few students who are specializing in vegetable gardening to obtain practice in greenhouse and gardens.

7. Undergraduate Research. Credit, one to three hours. Prerequisite course 3 and permission to register. By appointment. Mr. WORK.

A special problem, a typewritten report on which is expected. Laboratory fee according to the nature of the problem.



# OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

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These publications include

Catalogue Number (containing lists of officers and students), price 25 cents,

Book of Views, price 25 cents,

Directory of Faculty and Students, Second term, 1913-14, price 10 cents, and the following informational publications, any one of which will be sent gratis and post-free on request. The date of the last edition of each publication is given after the title.

General Circular of Information for prospective students, February 1, 1914.

Announcement of the College of Arts and Sciences, May 15, 1913.

Announcement of Sibley College of Mechanical Engineering and the Mechanic Arts, January 1, 1914. Announcement of the College of Civil Engineering, February 15, 1914. Announcement of the College of Law, April 15, 1913.

Announcement of the College of Architecture, June 1, 1913.

Announcement of the New York State College of Agriculture, June 15, 1913. Announcement of the Winter Courses in the College of Agriculture, July 1,

Announcement of the Department of Forestry, July 15, 1913.

Announcement of the Summer Term in Agriculture, April 15, 1914.

Announcement of the New York State Veterinary College, April 1, 1914.

Announcement of the Graduate School, January 15, 1914. Announcement of the Summer Session, March 15, 1914.

Annual Report of the President, November 1, 1913.

Pamphlets on scholarships, fellowships, and prizes, samples of entrance and scholarship examination papers, special departmental announcements, etc.

Correspondence concerning the publications of the University should be addressed to

The Secretary of Cornell University,

Ithaca, New York.