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NEW YORK STATE COLLEGE OF AGRICULTURE ANNOUNCEMENT OF THE SUMMER TERM 1920

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CALENDAR

Summer Term, 1920

June 19	Saturday,	Registration of all students.
June 21	Monday,	Instruction begins in all courses.
June 23	Wednesday,	Fifty-second Annual Commencement, Half Holiday.
Sept. 11	Saturday,	Instruction ends.

Summer Session

July 5	Monday,	Summer Sessions begins.
Aug. 13	Friday,	Summer Session ends.

Fall Term, 1920-21

Sept. 17	Friday,	Entrance examinations begin.
Sept. 27–28	Monday–Tuesday,	Registration of new students.
Sept. 29	Wednesday,	Registration of old students.
Sept. 30	Thursday,	Instruction begins.

THE NEW YORK STATE COLLEGE OF AGRICULTURE

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THE NEW YORK STATE COLLEGE OF AGRICULTURE

SUMMER TERM

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. In the College of Agriculture there is, in addition, a third, or summer, term, twelve weeks in length.

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 period of special instruction. Particular attention is given to the needs of assistants and instructors in colleges of agriculture who desire to spend their summers in advanced study.

Registration for the summer term will take place on June 19, 9 a. m. to 1 p. m. Permits for registration must be obtained from the Secretary of the College of Agriculture. Provided with these, the students first register with the University Registrar in Morrill Hall and then complete their registration and arrangement of schedules at the college office. Instruction will begin at 8 a. m. on June 21. The summer term will close at 1 p. m. on September 11. No classes will be held on the forenoon of Commencement Day, June 23. 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. As in other states, the state government has made large supplementary appropriations for 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 courses 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, publication 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." Since 1906 the State has provided many additional laboratory and classroom buildings, an extensive range of greenhouses, and a large equipment of farm buildings. The necessary technical equipment has been granted, and the teaching, experimental, and extension staffs greatly augmented. The State has been generous in its provision for the agricultural and home economics needs at the State College.

THE BUILDINGS AND FARMS

The buildings. The buildings erected under the enactment of 1904 were first occupied in June, 1907. The central group then erected consisted of a main administration and classroom building, an agronomy building, and a dairy building, the three being connected by covered loggias. Subsequently the Legislature provided for the erection of two large barns, a greenhouse, a home economics building, a forestry building, a poultry husbandry building, a soils building, an auditorium, and a classroom building and stock-judging pavilion for animal husbandry. An extension to the greenhouse range, several small poultry buildings, a sheep barn, a swine barn, a farm shop and tool shed, and an addition to the cafeteria in the Home Economics Building, have been completed, and a heating plant has been installed.

Other buildings included in the present equipment are frame buildings that house the Departments of Rural Engineering and Landscape Art, 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 933 acres of land and rents 195 additional acres, making a total of 1128 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 1128 acres, 591 are classified as arable, 304 as pasture, and 143 as wood and waste, 51 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; 29 acres have been assigned to the Department of Floriculture; 24 acres to the Department of Vegetable Gardening; 73 acres to the Department of Poultry Husbandry; 15 acres to farm-crop gardens and experiments; and there are left to the Department of Farm Practice 355 acres on which to conduct the regular farm operations.

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 adapted to corn and potatoes. The recently acquired areas lack both these improvements.

The New York State Game Farm at Cornell University. In order to provide for training in game farming and wild life conservation, in 1917 New York State established a state game farm in Tompkins County as part of the New York State College of Agriculture and under the control of the Board of Trustees of Cornell University. It is administered as part of the Department of Poultry Husbandry, and there is cooperation with the New York State Conservation Commission. The farm comprises about one hundred and seventy acres of land well adapted to game farming, and is equipped with barns and a dwelling house. It lies east of and adjacent to the present university farm, and is within easy walking distance of the College. It has been stocked with pheasants and other game birds, largely through donations of breeding stock. The American Game Protective Association has given, in addition to breeding stock, a considerable number of breeding coops and pens.

Breeding of ring-necked pheasants was carried on during the first season. In succeeding years the work will be gradually enlarged to include other species of useful game birds and other animals. Game breeding as a farm enterprise will be studied, and students will be afforded ample opportunity to obtain practical experience on the farm. Experimental work in the breeding and rearing of game is an important part of the enterprise.

EXPENSES

Tuition in the College of Agriculture is free to graduate students and to 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 undergraduate students from outside the State is $200 for two terms. The tuition fee for the summer term is $75.

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

Matriculation fee	$10.00
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 expense of 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 $10 to $12 a week.

All tuition and other fees may be changed by the Trustees to take effect at any time without previous notice.

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 leading to two baccalaureate degrees. Summer courses in agriculture, designed especially for teachers, school principals and superintendents, and advanced 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-YEAR COURSE

Men who are candidates for admission to the regular, or four-year, 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 acceptable 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 satisfy the farm-practice requirement.

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 FOR THE FOUR-YEAR 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 No. 1	(1½)	5a. First Year French	(1)
1b. English No. 2	(1½)	5b. Second Year French	(1)
2a. First Year Greek	(1)	5c. Third Year French	(1)
2b. Second Year Greek	(1)	6a. First Year Spanish	(1)
2c. Third Year Greek	(1)	6b. Second Year Spanish	(1)
3a. First Year Latin	(1)	6c. Third Year Spanish	(1)
3b. Second Year Latin	(1)	7a. First Year Italian	(1)
3c. Third Year Latin	(1)	7b. Second Year Italian	(1)
3d. Fourth Year Latin	(1)	7c. Third Year Italian	(1)
4a. First Year German	(1)	8a. Ancient History	(½–1)
4b. Second Year German	(1)	8b. Modern and Medieval History	(½–1)
4c. Third Year German	(1)		

8c.	American History, Civics	(½–1)	
8d.	English History	(½–1)	
9a.	Elementary Algebra	(1)	
9b.	Intermediate Algebra	(½)	
9c.	Advanced Algebra	(½)	
9d.	Plane Geometry	(1)	
9e.	Solid Geometry	(½)	
9f.	Plane Trigonometry	(½)	
9g.	Spherical Trigonometry	(½)	
10.	Physics	(1)	
11.	Chemistry	(1)	
12.	Physical Geography	(½–1)	
13.	Biology*	(1)	
14.	Botany*	(½–1)	
14a.	Zoology*	(½–1)	
15.	Bookkeeping**	(½–1)	
16.	Agriculture (including home economics)**	(½–4)	
17.	Drawing	(½–1)	
18.	Manual Training	(1)	
19.	Any high school subject or subjects not already used	(½–1)	

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 (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. (1) The Arts College Entrance Diploma, (2) the Science College Entrance Diploma, or (3) the Academic Diploma in Agriculture or Homemaking issued by the Board of Regents of the University of the State of New York or evidence of equivalent training.

If an applicant holding one of these diplomas does not present three units of foreign language, he must elect an equivalent amount of work in the University in one or more of the following subjects: foreign language, English, mathematics, philosophy, psychology, history, economics, political and social science.

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. In addition, applicants for admission on the age requirement must satisfy the faculty of their ability to perform 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 other such 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-year 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. 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, but only after admission to the College.

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*If an applicant has counted Biology (1), he may not also offer Botany (½) or Zoology (½).

**An applicant may offer not to exceed four units in vocational subjects under numbers 16, 18, and 19 combined. Bookkeeping may not be offered together with more than one of the subjects listed under 16, 17, and 18.

†French or German is recommended for entrance. For the Graduate School requirement with reference to a reading knowledge of French and German, see page 6 of the Announcement of the Graduate School.

Requirements for Admission to the Summer Term

Applicants for admission to the summer term as regular students in the four-year college course must, in addition to satisfying entrance requirements in full, have completed all the required work of the first year of the regular course as outlined on pages 14–15, or the substantial equivalent thereof. Special students are admitted to the summer term on the same basis as to other terms, as recited above.

Other Details for Admission

For other details as to subjects and methods for admission, see the General Circular of Information, which may be obtained upon 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 32 and 33 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, and in hygiene and preventive medicine, the completion of one hundred and twenty hours of required and elective work as outlined on pages 14 and 15.

Men students must satisfy the farm-practice requirement and women specializing in home economics, the home-economics-practice requirement before the beginning of the senior year. Exemption from the farm-practice requirement is allowed only to students specializing in the Departments of Botany, Forestry, Entomology, and Landscape Art. Application for such exemption must be made at the Office of the Secretary. All new men students must report to the Office of Farm Practice as assigned at registration.

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-year 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.

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.

The Course Leading to the Degree of Bachelor of Science
Required courses

	Hours
English	6
Botany, Biology, or Zoology	6
Chemistry or Physics	6
Physiology, one of the following	3
Physiology of Domestic Animals	
Human Physiology	
Plant Physiology	
Political Science	6
Botany, Zoology, Bacteriology, Chemistry, Physics, Geology, Physical Geography, Mathematics, Drawing	18

Students who do not present chemistry for entrance are required to take chemistry.

Students who do not present physics for entrance are required to take physics.

Students other than those specializing in home economics who do not present geology or physical geography for entrance are required to take one of these subjects.

Professional students in forestry and landscape art who do not offer solid geometry and plane trigonometry for entrance are required to take these subjects in their freshman year.

Not less than twenty-four hours of the required work is to be taken in the freshman year, including English; botany, biology, or zoology; and physics or chemistry.

Where an option of required courses is offered, consideration should be given to the prerequisites demanded by the elective courses to be taken subsequently.

Botany 1 is prerequisite for further work in botany, for professional courses in forestry, for courses in plant breeding, plant pathology, and pomology, and for most of the courses in farm crops and floriculture.

Botany 20 is prerequisite for Floriculture 3, for courses in plant breeding, pomology, and for professional work in forestry and landscape art.

Chemistry 1 is prerequisite for courses in home economics, pomology, and soil technology.

Chemistry 6 is prerequisite for Dairy 7 and Soil Technology 5, 6, and 7.

Political Science 51 is prerequisite for Agricultural Economics 10 and 30, Home Economics 120, Poultry 9, and Rural Organization 1.

Political Science 55a and 55b are prerequisite for Rural Organization 5 and 12.

Geology 1 is prerequisite for Soil Technology 1.

Physical Geography 5 is prerequisite for Soil Technology 5.

Drawing is prerequisite for Rural Engineering 1 and 2.

Elective Courses

The remainder of the work—seventy-five hours—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 chosen from the agricultural subjects described on the following pages.

In selecting his course after the first year the student must obtain the approval of a faculty adviser, preferably in 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, rural education, or home economics must take as their advisers professors or assistant professors in those departments. All students who are preparing for teaching are advised to consult the Professor of Rural Education as well as their Faculty Advisers before filing their term schedules.

DEPARTMENTS OF INSTRUCTION

AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

1. **Farm Cost Accounting.** Credit three hours. Lectures, T Th S, 9. Caldwell Hall 100. One laboratory period a week; students must report to the Department for assignment to laboratory sections. Not given to less than 10. Assistant Professor MISNER.

Farm inventories, single-enterprise accounts, complete farm accounts, and other farm records. Special emphasis is given to the interpretation of results and their application in the organization and management of the farm. Two half-day field trips will be taken. On these days the laboratory period will be from twelve o'clock to seven o'clock. Laboratory fee, $2.

2. **Farm Management.** Credit four hours. This course is designed for students who have had considerable farm experience and should be preceded or accompanied by course 1, economics, and as many as possible of the subjects dealing with the production of crops and animals. Lectures, M T W Th F, 10. Farm Management Building 102. One laboratory period a week. Students must report to the Department for assignment to laboratory sections before the course begins. On days when farms are visited, laboratory work may last longer than two and one-half hours. Not given to less than 10. Assistant Professor MISNER.

Lectures, recitations, and laboratory practice. Farming as a business; types of farming; balance of business; size of business; rates of production; farm layout; building arrangement; labor management; machinery; marketing; ways of starting farming; forms of tenure and leases; choosing and buying a farm; use of capital and credit; planning, organization, and management of specific farms. Two out-of-town trips will necessitate leaving on noon trains and returning on evening trains. Laboratory fee, $2.

BOTANY

6. **Taxonomy of the Higher Plants.** Credit four hours. Prerequisite course 1 or its equivalent. Lecture, F, 8. Laboratory, M W F, 2–5. The remaining work by appointment. Stone Hall, Botanical Laboratory. Professor WIEGAND and Messrs. BECHTEL and ———.

A study of the kinds of seed plants and ferns, their classification into genera, families, and orders, and field work on the flora about Ithaca. Emphasis will be placed on wild plants, but the commoner cultivated plants will receive some attention. The course is planned to follow course 1 and to furnish an introduction to the knowledge of the field botany and classification of the higher plants, in preparation for special work in various departments and as an aid in teaching. Instruction will be given in the preparation of an herbarium and of keys. Laboratory fee, $4; deposit, $2.

6a. **Advanced Field Course in Taxonomy.** Credit four hours. Prerequisite course 6 or its equivalent. Laboratory and field work, W, 8–1, 2–5. Remainder of work at times optional with the student. Professor WIEGAND.

An intensive study of the summer flora about Ithaca, with the consideration also of some advanced problems and methods in taxonomy. Laboratory fee, $4; deposit, $2.

13. **Comparative Morphology of Bryophytes and Pteridophytes.** Credit four hours. Prerequisite course 1 or its equivalent. Lectures, M Th, 8, F, 9. Stone Hall 203. Laboratory, M Th F, 10–12.30. Stone Hall, Botanical Laboratory. Assistant Professor SHARP and Mr. RANDOLPH.

An advanced course embracing comparative and developmental studies of bryophytes and pteridophytes. Emphasis is placed on evolutionary and reproductive features. Laboratory fee, $5.

14. **Comparative Morphology of Gymnosperms and Angiosperms.** Credit four hours. Prerequisite course 1 or its equivalent, and course 13. Lectures, T Th, 8, F, 9. Stone Hall 203. Laboratory ,T Th, 9–11.30, F, 10–12.30. Stone Hall, Botanical Laboratory. Assistant Professor EAMES and Mr. RANDOLPH.

An advanced course designed to follow course 13, and dealing in a similar way with the structure and development of gymnosperms and angiosperms. Laboratory fee, $5.

21a. **Plant Physiology, Advanced Lecture Course.** Credit three hours. Prerequisite training in botany and chemistry, to be determined in each case by the Department; recommended for seniors and graduate students. Lectures, M T Th F, 7 a. m. Stone Hall 192. Professor KNUDSON.

22a. **Plant Physiology, Advanced Laboratory Course.** Credit four hours. Must be preceded or accompanied by course 21. Laboratory, M T Th F, 10–1. Professor KNUDSON and Mr. ———.

Courses 21 and 22 or 21a and 22a are comprehensive courses and are recommended for students specializing in plant study, including the applied subjects. Laboratory fee, $10; breakage deposit, $5.

Courses Intended Primarily for Graduates

18. **Research in General Botany, Histology, and Taxonomy.** Credit not less than three hours. Professor WIEGAND and Assistant Professors EAMES and SHARP.

A course designed for graduates and advanced students. Original investigation by students who are adequately prepared. The laboratory fee depends on the nature of the work.

19. **Seminary in Taxonomy, Morphology, Cytology, and Histology.** Required of graduate students in the Department. Hours and place to be arranged. Professor WIEGAND and Assistant Professors EAMES and SHARP.

Broad problems pertaining to botany will be discussed; literature will be reviewed; reports of research will be given.

31. **Seminary in Plant Physiology.** Required of graduate students in plant physiology. Conference, hours to be arranged. Stone Hall 192. Professor KNUDSON.

Topics will be chosen from current work in plant physiology.

33. **Research, Plant Physiology.** Credit for major or minor, otherwise not less than four hours. Prerequisite training in botany, chemistry, and physiology. Stone Hall 101. Professor KNUDSON.

Problems in plant physiology and in the general relation of plant physiology to agriculture will be assigned for investigation. Reports or a thesis will be required. The amount of the laboratory fee is governed by the nature of the work.

ENTOMOLOGY AND LIMNOLOGY

Introductory Entomology

For advanced work in entomology a reading knowledge of French or German is essential. Chemistry 1 and 6 or their equivalents are highly desirable. Students should consult the professor in charge before registering in research courses Nos. 19, 29, 49, 59. The laboratory fees in these will depend upon the nature of the work.

2. **The Ecology of Insects.** Credit three hours. Lecture, W, 8. Roberts Hall 392. Practical exercises, largely field work, W, 10–12.30, and two others by appointment. Professor NEEDHAM and Mr. WELLHOUSE.

A general course in the study of the lives of insects in relation to their environment. 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. Laboratory fee, $2.50.

3. **General Entomology.** Credit three hours. Prerequisite course 1, Zoology 1, or Botany 1. Lectures, M W, 9. Roberts Hall 392. Assistant Professor MATHESON. Practical exercises, T Th, 2–4.30. Roberts Hall 392. Assistant Professor MATHESON and Mr. LUNDIE.

This course embraces 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 (two hours) are taken by those who have had courses 4 and 5. Laboratory fee, $1.50.

4. **Elementary Morphology of Insects.** Credit three hours. Hours by appointment. Roberts Hall 391. Professor JOHANNSEN, Messrs. WELLHOUSE and HUCKETT.

An introductory laboratory course. (See note under course 5.) Laboratory fee, $2.

5. **Elementary Systematic Entomology.** Credit two hours. Prerequisite course 4. Hours by appointment. Roberts Hall 391. Assistant Professor BRADLEY, Messrs. WELLHOUSE and HUCKETT.

Courses 4 and 5 are introductory laboratory courses required of all students who plan to take advanced work in entomology. The work is individual, and both courses may be taken in one term. Laboratory fee, $2.

19. **Research in Systematic Entomology.** Credit three or more hours a term. Prerequisite courses 3, 10, 11, 14, and 20, and one term of course 12. Laboratory hours by arrangement. Roberts Hall 301. Professors NEEDHAM and JOHANNSEN.

29. **Research in Morphology of Insects.** Credit three or more hours a term. Prerequisite courses 3, 4, and 5. Laboratory open daily except S, 8–5; S, 8–1. Roberts Hall 391. Professors JOHANNSEN and NEEDHAM.

Special work arranged with reference to the needs and attainments of each student.

49. **Research in Economic Entomology.** Credit three or more hours a term. Prerequisite courses 3, 4, and 5. Laboratory and field work by appointment. Insectary. Professor HERRICK, Assistant Professor MATHESON, and Mr. MUESEBECK.

In most cases it is impracticable to complete an investigation in this subject during the first and second terms. Students must arrange to conduct their observations during the growing season.

59. **Research in Limnology.** Credit three or more hours a term. Prerequisite course 50 or its equivalent. Laboratory and field work by appointment. Roberts Hall 492 and Biological Field Station. Professor NEEDHAM and Assistant Professor EMBODY.

Seminary

Seminary. M, 4.15–5.15. Roberts Hall 392.

The work of an entomological seminary is conducted by the Jugatæ, an entomological club which meets for the discussion of the results of investigations by its members.

FARM CROPS

6. **Systematic Farm Crops.** Credit two or more hours. Primarily for graduate students. Lecture and laboratory periods, W F, 2–5. Poultry Building 174. Assistant Professor WIGGANS.

The work consists largely of field laboratory work in the gardens of the department, on the identification and classification of cereal crops.

8. **Research.** Credit two or more hours. Prerequisite permission to register. Limited to graduate students. Professor MONTGOMERY, and Assistant Professors HARDENBURG and WIGGANS.

Division of Vegetable Gardening

15. **Systematic Olericulture.** Offered in summer term if as many as five students register. Credit two hours. Prerequisite course 11. Lecture, T, 10. Poultry Building 325. Laboratory, T or Th, 2–4.30. Vegetable greenhouses and East Ithaca garden. Professor H. C. THOMPSON or Mr. ———.

A systematic study of varieties and strains of the important groups of vegetables. Lectures cover origin, history, and development of vegetables and of varieties adapted to special uses. Laboratory exercises take up the study of varietal characters in the field, also the study of types and of the habits of growth and the characteristics of specific types. Some attention is paid to the use of a score card for judging vegetables. Laboratory fee, $2.

16. **Research.** Credit three or more hours. For graduate students only. Hours by appointment. Poultry Building. Professor H. C. THOMPSON and Assistant Professor SCHNECK.

FLORICULTURE

8. **Garden Flowers.** Credit three hours. Prerequisite Botany 1. Lectures T W Th, 9. Floriculture Building. Practice, T Th, 2–4.30. Greenhouses and gardens. Miss MINNS and Mr. PRATT.

A study of the identification, propagation, and culture of annuals, herbaceous perennials, and roses. The aim is to give the student an intimate knowledge of those forms of annual and herbaceous plants that may be used in garden planting, either on home grounds or in public parks. An excellent collection of plant material is available for demonstration work in this course. All members of the class will be required to participate in an excursion to the Thompson estate at Canandaigua on August 12. Laboratory fee, $2.

8a. **Grouping and Arrangement of Annuals and Herbaceous Perennials.** Credit two hours. Prerequisite course 8. Lecture, F, 9. Practice, S, 8–1. Floriculture Building. Miss MINNS.

A study of the principles and methods of arrangement of garden flowers in the border and the flower garden. The planting of borders for a continuous display of bloom throughout the season. Æsthetic taste in color arrangement will also be studied. Laboratory fee, $2.

9. **Amateur Floriculture.** Credit two hours. Lectures, W F, 11. Floriculture Building. Practice M, 2–5. Greenhouses. Miss MINNS and Mr. PRATT.

The propagation and culture in the home of potted plants suitable for window gardening and for outdoor home gardening. The course includes a study of containers, soils, fertilizers, and insecticides; also the preparation and planting of flower beds. It is planned primarily for students who are interested especially in home economics, but is open to any one desiring information regarding simple methods of plant culture. Laboratory fee, $2.

12. **Investigation in Floriculture.** Throughout the year, credit one or two hours. Prerequisite courses 1, 3, and 4, and permission to register. Designed primarily for upperclassmen and graduate students. Consultation by appointment. Professors WHITE and BEAL, and Miss MINNS.

The investigation of problems in growing flowers for cutting, exotics, garden flowers, and the like.

FORESTRY

Work in the Forestry Department during the third term is confined to one month of field work in a forestry camp, conducted by the Department in a forest region in New York State. This month, together with three months employment in a forest industry, or in federal or state forest work, or equivalent experience, now constitutes the requirement of forestry practice demanded of all professional forestry students.

The Cornell Forestry Camp will open Saturday, August 28, 1920, and close September 25, 1920. It is open only to professional forestry students who have completed the junior year. Such students must register with the Department of Forestry for attendance at camp, not later than June 1, 1920.

Graduate students may do work in forestry during the summer, under the direction of members of the Department of Forestry staff, but such work may not be counted as a part of the minimum residence requirement demanded of candidates for the degree Master in Forestry. Graduate students desiring summer work of this kind should consult Professor Hosmer.

LANDSCAPE ART

13. **Plant Materials.** Credit five hours. Lectures, M W, 8. Laboratory and field trip, M F, 10–12.30, M W F, 2–5. Open to general election but intended for juniors in landscape art. Professor CURTIS.

A study of the characteristics and requirements of trees, shrubs, and vines for landscape planting, and a discussion of them as elements in landscape composition. Laboratory fee, $1.50.

PLANT PATHOLOGY

1. **General Plant Pathology.** Credit three hours. Prerequisite Botany 1 or its equivalent. Lecture, W. 8. Roberts Hall, 202. Practice, W F, 2–4.30. Bailey Hall, West Basement. Professor WHETZEL.

A fundamental course treating of the nature, cause, and control of plant diseases, illustrated by studies of the commoner diseases of cultivated crops. The

practice section must be taken in the couplet announced above, and is limited to twenty-four students. Laboratory fee, $4.50; breakage deposit, $3.

20. **Research.** Not less than three laboratory periods of three clock hours a week. Professors and assistant professors on the departmental staff.

Laboratory fee, $1.50 a credit hour; breakage deposit, $3.

POMOLOGY

11. **Orchard Field Trip.** Credit one hour. Prerequisite courses 1 and 8, and permission to register. To be taken during the three weeks preceding the opening of the first term. Students who wish to take this trip must signify their intention by July 20 preceding. The expense of the trip must be met by the individual student. Students may register for this course in third or first term. Assistant Professors HEINICKE and MACDANIELS.

The course is designed to give the students who specialize in pomology an intimate knowledge of practical orchard conditions.

12. **Experimental Pomology.** Credit three hours. Prerequisite courses 1 and 8, and permission to register; must be preceded or accompanied by Botany 20, Plant Pathology 1, Entomology 3, and Soils 1. Discussions, T W Th F, 9. Roberts Hall 202. Professor CHANDLER and Assistant Professor HEINICKE.

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 concluded or are being conducted.

13. **Pomology, Advanced Laboratory Course.** Credit one hour. Must be preceded or accompanied by course 12, and requires permission to register. Hours to be arranged. Assistant Professors HEINICKE and MACDANIELS, and Messrs. ——— and ———.

The course is designed to give more extended practice in the various nursery and orchard operations than can be given in course 1. It is intended for students doing their major work in pomology. Laboratory fee, $2.

19. **Research.** Credit one or more hours. Prerequisite course 12, and permission to register. Professors CHANDLER and REES, and Assistant Professors HEINICKE and MACDANIELS.

20. **Seminary.** Once each month throughout the year. Required of graduate students in pomology. Roberts Hall 292. Members of the departmental staff.

Undergraduates who are interested will be welcome to attend without receiving credit toward graduation.

POULTRY HUSBANDRY

2a. **Flock Management.** Credit one hour. Must be preceded or accompanied by course 2 or by course 10, and preferably also by Animal Husbandry 1. Practice periods and extra time arranged by appointment. Practice, reporting three times daily, including Sunday, for four weeks, 7.45–8.30, 12.45–1.15, 4.30–5. Poultry Building. Messrs. CARD, ANDREWS, and JENKINS.

Practice in record keeping, and management of fowls for egg production and for fattening, including preparation for market. Assigned reading and a written examination will be required.

3. **Incubator Practice.** Credit one hour. Must be preceded or accompanied by course 1a or by course 10. Practice periods and extra time arranged by

appointment. Practice, reporting three times daily, including Sunday, for four weeks, 7.45–8.30, 12.45–1.15, 4.30–5. Poultry Building. Messrs. CARD and ANDREWS.

Practice in operating incubators, testing eggs, keeping records; comparison of results. A series of interesting tests will be conducted by the members of the class. Assigned reading and a written examination will be required.

3a. **Brooder Practice.** Credit one hour. Must be preceded or accompanied by course 1a or by course 10. Practice periods and extra time arranged by appointment. Practice, reporting three times daily, including Sunday, for four weeks. 7.45–8.30, 12.45–1.15, 4.30–5. Poultry Building. Messrs. CARD and ———.

Practice in the management of a brooder and a flock of chickens; the keeping of temperature, food, and growth records. Assigned reading and a written examination will be required.

7a. **Marketing Practice.** Credit one hour. Prerequisite course 7 and permission to register. Discussion hour, Th, 4.45–5.45. Practice period, three hours each week, to be arranged by appointment. Poultry Building 100. Mr. MACOMBER.

This course is for students who desire additional instruction and practice in the handling of poultry products and refrigeration machinery, and in general salesroom work.

10. **Farm Poultry.** Credit three hours. Lectures, M W F, 11. Poultry Building 375. Practice, T, 2–4.30. Poultry Building 300. Mr. CARD.

This course is for persons who are not specializing in poultry husbandry. It is not open, without special permission, to students who have had other courses in poultry husbandry.

A brief general course dealing with the practical application of the principles of poultry husbandry to general farm conditions.

11a. **Seminary.** For graduate students only; required of all graduate students in poultry husbandry. F, 4.30–6. Poultry Library. Members of the departmental staff.

A discussion of advanced work in poultry husbandry.

12. **Research.** Credit one to three hours. Prerequisite permission to register; must be preceded or accompanied by course 8 or 11a. Time arranged by appointment. Poultry Building. Members of the departmental staff.

An original investigation of a problem in poultry husbandry, to be presented as a written thesis. Frequent conferences are required of all students electing this course.

RURAL EDUCATION

The undergraduate courses in the Department of Rural Education, with the exception of those in nature study, are provided for under the Smith-Hughes Act and are open only to students who are following the prescribed courses for vocational teachers of agriculture and homemaking. Students must arrange with the Department before registering for any of the courses. Not more than twenty-five students will be admitted to a section. Additional sections will be formed if the registration is sufficient.

2. **Educational Psychology.** Credit three hours. Open to juniors and seniors. Lectures, T Th S, 11–12.30. Caldwell Hall 282. Professor KRUSE.