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NEW YORK STATE COLLEGE OF AGRICULTURE ANNOUNCEMENT OF THE SUMMER TERM 1915

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CALENDAR

Summer Term

June 7.	Monday,	Registration of all students
June 8.	Tuesday,	Instruction begins in all courses
June 16.	Wednesday,	Forty-sixth Annual Commencement
		Half holiday
July 5.	Monday,	Holiday.
Sept. 22.	Wednesday,	Instruction ends.

Summer Session

July 6.	Tuesday,	Summer Session begins
Aug. 13.	Friday,	Summer Session ends

Fall Term, 1915-16

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.
Oct. 2.	Saturday.	Registration. Graduate School.

NEW YORK STATE COLLEGE OF AGRICULTURE

FACULTY

- Jacob Gould Schurman, A.M., D.Sc., LL.D., President of the University.
Beverly Thomas Galloway, B.Agr., Sc., LL.D., Dean of the College of Agriculture and Director of the Experiment Station.
Isaac Phillips Roberts, M.Agr., Professor of Agriculture, Emeritus.
John Henry Comstock, B.S., Professor of Entomology and General Invertebrate Zoology, Emeritus.
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.
James Edward Rice, B.S.A., Professor of Poultry Husbandry.
George Walter Cavanaugh, B.S., Professor of Chemistry in its Relations to Agriculture.
George Nieman Lauman, B.S.A., Professor of Rural Economy.
Herbert Hice Whetzel, M.A., Professor of Plant Pathology.
Elmer O. Fippin, B.S.A., Extension Professor of Soil Technology.
George Frederick Warren, Ph.D., Professor of Farm Management.
William Alonzo Stocking, jr., M.S.A., Professor of Dairy Industry.
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.
Ralph Sheldon Hosmer, B.S.A., M.F., Professor of Forestry.
James George Needham, Ph.D., Professor of Entomology and Limnology.
Bryant Fleming, B.S.A., Professor of Landscape Art.
Rollins Adams Emerson, B.Sc., Ph.D., Professor of Plant Breeding.
Harry Houser Love, Ph.D., Professor of Plant Breeding Investigations.
Arthur Witter Gilbert, Ph.D., Professor of Plant Breeding.
Donaid Reddick, Ph.D., Professor of Plant Pathology.
Edward Gerrard Montgomery, M.A., Professor of Farm Crops.
George Alan Works, B.Ph., M.S. in Agr., 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 and Entomologist of the Experiment Station.
Howard Wait Riley, M.E., Professor of Rural Engineering.
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, M.S. in Agr., Professor of Research in 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.
Elmer Seth Savage, M.S.A., Ph.D., Professor of Animal Husbandry.
Kenneth Carter Livermore, B.S. in Agr., Ph.D., Professor of Farm Management.
Edward Albert White, B.S., Professor of Floriculture.
Alvin Casey Beal, Ph.D., Professor of Floriculture.
Herbert Andrew Hopper, B.S.A., Extension Professor of Animal Husbandry.
Edward Sewall Guthrie, M.S. in Agr., Ph.D., Professor of Dairy Industry.
Maurice Chase Burritt, B.S. in Agr., Extension Professor and State Director of Farm Bureaus.
Frank Benjamin Moody, A.B., M.S.F., Extension Professor of Forestry.
William Charles Baker, B.S.A., Professor of Drawing.
Mortier Franklin Barrus, A.B., Ph.D., Extension Professor of Plant Pathology.
Lewis Josephus Cross, B.A., Ph.D., Professor of Chemistry in its Relations to Agriculture.
Oskar Augustus Johannsen, A.M., Ph.D., Professor of General Biology.
Clyde Hadley Myers, M.S., Ph.D., Professor of Plant Breeding.
Bristow Adams, B.A., Professor of Extension, Information Service.
Dick J. Crosby, M.S., Professor of Extension Teaching.
George Abram Everett, A.B., LL.B., Assistant Professor of Extension Teaching.
Lewis Knudson, B.S.A., Ph.D., Assistant Professor of Botany.
James Chester Bradley, Ph.D., Assistant Professor of Systematic Entomology.
E. Gorton Davis, B.S., Assistant Professor of Landscape Art.
John Bentley, jr., B.S., M.F., Assistant Professor of Forestry.
George Charles Embody, Ph.D., Assistant Professor of Aquiculture.
Harry Oliver Buckman, M.S.A., Ph.D., Assistant Professor of Soil Technology.
Mrs. Helen Binkerd Young, B.Arch., Assistant Professor of Home Economics.
Alice Gertrude McCloskey, A.B., Assistant Professor of Rural Education.
Mrs. Anna Botsford Comstock, B.S., Assistant Professor of Nature Study.
Ralph Hicks Wheeler, B.S., Assistant Professor of Extension Teaching.
Harry Morton Fitzpatrick, Ph.D., Assistant Professor of Plant Pathology.
Byron Burnett Robb, B.S. in Agr., Assistant Professor of Rural Engineering.
Walter Warner Fisk, M.S. in Agr., Assistant Professor of Dairy Industry.
Halsey B. Knapp, B.S., M.S. in Agr., Assistant Extension Professor of Pomology.
Ralph Wright Curtis, M.S.A., Assistant Professor of Landscape Art.
Vern Bonham Stewart, A.B., Ph.D., Assistant Professor of Plant Pathology.
Annette J. Warner, Assistant Professor of Home Economics.
Arthur Lee Thompson, Ph.D., Assistant Professor of Farm Management.
Royal Gilkey, B.S.A., Assistant Professor of Extension Teaching, and Supervisor of Reading Courses.
Charles Truman Gregory, Ph.D., Assistant Professor of Plant Pathology.
Lex Ray Hesler, A.B., Ph.D., Assistant Professor of Plant Pathology.
Ivan Claude Jagger, B.S. in Agr., Assistant Professor of Plant Pathology.
William Howard Rankin, A.B., Ph.D., Assistant Professor of Plant Pathology.
Earl Whitney Benjamin, B.S. in Agr., Ph.D., Assistant Professor of Poultry Husbandry.
Arthur Johnson Eames, Ph.D., Assistant Professor of Botany.
James Kenneth Wilson, B.S., Ph.D., Assistant Professor of Soil Technology.
Elmer Eugene Barker, A.B., Ph.D., Assistant Professor of Plant Breeding.
Edward Mowbray Tuttle, B.S. in Agr., A.B., Assistant Professor of Rural Education.

Robert Matheson, M.S. in Agr., Ph.D., Assistant Professor of Economic Entomology.

Blanche Evans Hazard, A.B., M.S., Assistant Professor of Home Economics.

David Lumsden, Assistant Professor of Floriculture.

John Hall Barron, B.S.A., Assistant Extension Professor of Farm Crops.

Gad Parker Scoville, B.S. in Agr., Assistant Professor of Farm Management.

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

George Walter Tailby, jr., Instructor and Superintendent of Live Stock.

Howard Edward Babcock, Ph.B., Assistant State Director of Farm Bureaus.

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

Lester Whyland Sharp, B.S., Ph.D., Instructor in Botany.

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

Bertha E. Titsworth, B.S., Instructor in Home Economics.

Helen Knowlton, A.B., Instructor in Home Economics.

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

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

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

Harold Allen Severy, A.B., A.M., Instructor in Botany.

Earle Volcart Hardenburg, B.S., Instructor in Farm Crops.

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

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

Oliver Wesley Dynes, M.S. in Agr., Instructor in Farm Crops.

Carl Edwin Ladd, B.S. in Agr., Instructor and Investigator in Farm Management.

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

Roland Harrison Patch, B.S., Instructor in Floriculture.

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

Thomas Joseph McInerney, M.S. in Agr., Instructor and Investigator in Dairy Industry.

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

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

Juan Estevan Reyna, E.E., Instructor in Drawing.

Norman Damon Steve, B.S., Instructor in Farm Engineering.

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

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

Earl Long Overholser, M.S.A., Instructor in Pomology.

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

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

Frank Elmore Rice, A.B., Instructor in Agricultural Chemistry.

Elmer Rosel Zimmer, Instructor in Animal Husbandry.

Charles Paul Alexander, B.S., Instructor in The Farm Course.

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

Laurence Howland McDaniels, A.B., Instructor in Botany.

Allan Cameron Fraser, B.S., Instructor in Plant Breeding.

Lua Alice Minns, B.S., Instructor in Floriculture.

Alfred Carl Hottes, B.S., M.S. in Agr., Instructor in Floriculture.

George Cornell Supplee, B.S., M.S.A., Instructor in Dairy Industry.

Anna Elizabeth Hunn, B.S., Instructor in Home Economics, and Manager of Cafeteria.

William Thomas Craig, Instructor in Plant Breeding.
Montgomery Robinson, Litt.B., B.S., Instructor in Extension Teaching.
Josiah Randall Livermore, B.S., Instructor in Plant Breeding.
Arthur John Heinicke, B.S.A., M.A., Instructor in Pomology.
Francis Elton Rogers, B.S., Extension Instructor in Pomology.
Olney Brown Kent, B.S., Instructor in Poultry Husbandry.
Harold Deane Phillips, B.S. in Agr., Instructor in Rural Economy.
Henry William Schneck, B.S., Instructor in Vegetable Gardening.
Wesley Worth Warsaw, B.S. in A.E., Extension Instructor in Soil Technology.
Karl John Seulke, M.S.A., Instructor in Animal Husbandry.
DeVoe Meade, B.S., Instructor in Animal Husbandry.
Edward Gardner Misner, B.S., Instructor in Farm Management.
Bernard William Shaper, B.S., Instructor in Extension Teaching.

Other Officers of Instruction and Administration

Louis Hamilton Moulton, Farm Superintendent.
Carl Ilg, Assistant Curator in Entomology.
Ada Eljiva Georgia, Assistant in The Farm Course.
William Carlyle Etheridge, B.S., M.S. in Agr., Assistant in Farm Crops.
Ira Myron Hawley, A.B., Assistant in Economic Entomology.
Walter Miller Peacock, B.S., Assistant in Farm Crops.
Rowland Willis Leiby, B.S., Assistant in Insect Morphology.
William Frederick Friedman, B.S., Assistant in Plant Breeding.
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.
Henry Joseph Conlin, A.B., Assistant in Agricultural Chemistry.
William Francis Flynn, B.Chem., Assistant in Agricultural Chemistry.
Vern Reuben Jones, B.S., Assistant in Dairy Industry.
Howard Bowman Ellenberger, B.S.A., Assistant in Dairy Industry.
Ralph Irving Scoville, B.S., Assistant in Dairy Industry.
Claribel Nye, B.S., Assistant in Home Economics.
Clark Leonard Thayer, B.Sc., Assistant in Floriculture.
Gail J. Fink, A.B., Ph.D., Assistant in Soil Technology.
David Stout Jennings, B.S., Assistant in Soil Technology.
Mortimer Demarest Leonard, B.S., Extension Assistant in Entomology.
James LeRoy Weimer, A.B., Assistant in Plant Pathology.
John Douglas Tothill, B.S.A., Assistant in Parasitology.
Arthur Bishop Beaumont, B.S., Assistant in Soil Technology.
Cornelia Ferris Kephart, B.S. in Agr., Library Assistant in Department of Entomology.
Charles Edward Hunn, Foreman of Grounds.
Andrew Jackson Lamoureux, Assistant in Library.
George Wilson Parker, Clerk and Accountant.
Lucy Harriet Ashton, Assistant to the Registrar.
Emmons William Leland, B.S.A., Superintendent of Field Experiments in Soil Technology.
Anna Mary Atwater, Laboratory Assistant in Plant Breeding.
Laura McLallen Van Auken, Clerk in Department of Dairy Industry.

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

In view of the fact that the introduction of the new term affected the organization of the entire college year, it is possible in the summer of 1915 to offer only a limited number of courses. After the present year, when the readjustments will fully 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 7, 1915, 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 in Roberts Hall for further registration and arrangement of schedules. Instruction will begin at 8 a. m. on June 8. The summer term will close at 5 p. m. on September 22. No classes will be held on the forenoon of Commencement Day, June 16, or on July 5.

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. 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. Appropriations are available for an extension to the greenhouse range, for additional barns, and for small poultry buildings.

Other buildings included in the present equipment are a frame building that temporarily houses the Department of Rural Engineering, 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	\$ 5.00
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 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 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 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 for 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 A	(2)	8b. Modern History	($\frac{1}{2}$ -1)
1b. English B	(1)	8c. Am. History, Civics	($\frac{1}{2}$ -1)
2a. First Year Greek	(1)	8d. English History	($\frac{1}{2}$ -1)
2b. Second Year Greek	(1)	9a. Elementary Algebra	(1)
2c. Third Year Greek	(1)	9b. Intermediate Algebra	($\frac{1}{2}$)
3a. First Year Latin	(1)	9c. Advanced Algebra	($\frac{1}{2}$)
3b. Second Year Latin	(1)	9d. Plane Geometry	(1)
3c. Third Year Latin	(1)	9e. Solid Geometry	($\frac{1}{2}$)
3d. Fourth Year Latin	(1)	9f. Plane Trigonometry	($\frac{1}{2}$)
4a. First Year German	(1)	9g. Spher. Trigonometry	($\frac{1}{2}$)
4b. Second Year German	(1)	10. Physics	(1)
4c. Third Year German	(1)	11. Chemistry	(1)
5a. First Year French	(1)	12. Physical Geography	($\frac{1}{2}$ -1)
5b. Second Year French	(1)	13. Biology*	(1)
5c. Third Year French	(1)	14. Botany*	($\frac{1}{2}$ -1)
6a. First Year Spanish	(1)	15. Zoology*	($\frac{1}{2}$ -1)
6b. Second Year Spanish	(1)	16. Agriculture (including home economics) **	($\frac{1}{2}$ -4)
6c. Third Year Spanish	(1)	17. Drawing	($\frac{1}{2}$ -1)
7a. First Year Italian	(1)	18. Manual Training	(1)
7b. Second Year Italian	(1)	19. Any high school subject or subjects not already used	($\frac{1}{2}$ -1)
7c. Third Year Italian	(1)		
8a. Ancient History	($\frac{1}{2}$ -1)		

*If an applicant has counted Biology (1) he may not offer also Botany ($\frac{1}{2}$) or Zoology ($\frac{1}{2}$).

**An applicant may offer not to exceed four units in vocational subjects under numbers 16, 18, and 19 combined.

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 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. 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 four year 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 pages 12-13, or the substantial equivalent thereof. Special students are admitted to the summer term on the same basis as to other terms, as recited above.

Other Details for Admission

For other details as to subjects and methods for 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.

*French 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.

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 28 and 29 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 Departments 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 12-14.

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 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. 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, or entomology, 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.

The Course Leading to the Degree of Bachelor of Science

Freshman year	Number of course	Hours 1st term	Hours 2d term
English	1....	4....	4
Chemistry	1....	6....	—
Chemistry	85 or 6....	—....	4 or 5
Biology	1....	3....	3
The Farm .....	.....	2....	—
Physics	2....	.....	5
Electives* .....	.....	0-3....	4-7
Total	15-18	15-18	

*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.

Sophomore year	Number of course	Hours 1st term	Hours 2d term
Geology*	1....	3....	-
Chemistry**	85....	....	4
Physiology,*** one of the following:			
Physiology of domestic animals	12....	-....	3
Human physiology	3....	-....	3
Plant physiology	20 or 21....	-....	4
Botany	1....	5....	-
or			
Zoology	1....	5....	-
Electives	....	7-10....	6-11
Total		15-18	15-18

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

Political Science 51 may be taken this year.

Junior year	Number of course	Hours 1st term	Hours 2d 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 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, home economics, or rural education 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

*Optional for students taking a major in home economics.

**Required of students taking Chemistry 6 in the freshman year.

***May be taken in junior or senior year by special permission.

- Group B—Animal Husbandry
 - Poultry Husbandry
 - Dairy Industry
 - Entomology
- Group C—Agricultural Chemistry
 - Botany
 - Plant Breeding
 - Plant Pathology
 - Meteorology
- Group D—Rural Economy
 - Rural Education
 - Farm Management
 - Extension
 - Rural Engineering
 - Drawing
- Group E—Forestry
 - Home Economics
 - Landscape Art

DEPARTMENTS OF INSTRUCTION

BOTANY

6a. **Taxonomy of the Higher Plants.** Credit four hours. Prerequisite course 1 or its equivalent. Lectures, by appointment. Agronomy Building 192. Laboratory, W F, 2-4.30. Agronomy Building, Botanical Laboratory. Field work by appointment. Doctor EAMES and Mr. ———.

Identification, classification, and ecology of the seed plants and ferns: a detailed study of the local flora about Ithaca with reference to the recognition, classification, and nomenclature of species and varieties. A study of floral and folial characteristics will also be made. 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. Laboratory fee, \$3.50.

9. **Histology.** Credit four hours. Prerequisite course 1 or its equivalent. Lectures, T, 11. Laboratory, T Th S, 8-10.30. Agronomy Building, Botanical Laboratory. Doctor EAMES and Mr. ———.

This course is designed to give a knowledge of the structure and morphology of plant tissues and organs. Emphasis will be placed on the relation of structure to function, and on the modifications due to phylogenetic development and to ecological factors. Traumatic and pathogenic tissues, and the effect of parasitism, symbiosis, and other factors on the various tissues, will be studied. Laboratory work will include methods and practice in microtechnique. Laboratory fee, \$5.

21a. **Plant Physiology, Advanced Course.** Credit five 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, 10-1. Assistant Professor KNUDSON.

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

21b. Plant Physiology, Advanced Course. Credit five hours. Prerequisites as for 21a. Lectures, T Th, 8. Agronomy Building 192. Laboratory, T Th, 10-1. Assistant Professor KNUDSON.

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.

18. Research in General Botany, Histology, and Taxonomy. Not less than three hours, by appointment. Professor EAMES.

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. Credit one hour. Credit restricted to graduate students in the Department. Hours to be arranged. Professor EAMES.

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

30. Special Chapters in Metabolism. Credit one hour or more. Lectures and laboratory. Assistant Professor KNUDSON.

A study of some of the more important temporary and storage products of plant metabolism. Open only to graduates, or to undergraduates who have had course 21 and organic chemistry.

31. Seminary in Plant Physiology. Credit one hour. Limited to graduates taking work in the Department. Conferences, F, 11. Agronomy Building 192. Assistant 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 adequate training in botany, chemistry, and physiology. By appointment. Agronomy Building 101. Assistant Professor KNUDSON.

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

DAIRY INDUSTRY

1. Milk Composition and Tests. Credit three hours. For regular students only. Students must consult the Department in regard to laboratory assign-

ments before registering for the course. Lectures, T S, 11. Dairy Building 222. Practice, Th, 2-4.30. Dairy Building 232. Professor ROSS and Mr. McINERNEY.

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

DRAWING

2b. **Free-hand Drawing and Outdoor Sketching.** Credit two to five hours. Lectures during practice. Practice by appointment. M W F S, 8-12, T Th, 2-5. Dairy Building 371. Professor BAKER.

While this course is designed more particularly to meet the needs of the students of landscape art, being out-of-door study of foliage, tree-growth, and architecture, provision is also made for the needs of the general student of freehand drawing and of teachers of the subject in the secondary schools.

ENTOMOLOGY, LIMNOLOGY, AND NATURE STUDY

2. **The Ecology of Insects.** Credit three hours. One lecture and two practical exercises, largely field work. Lectures, W, 8. Roberts Hall 392. Practical exercises, one Th, 2-4.30, and one by appointment. Professor NEEDHAM and Messrs. LLOYD and CHAPMAN.

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.

3. **General Entomology.** Credit three hours. Prerequisite course 1 or Zoology 1. Lectures, W F, 9. Roberts Hall 392. Practical exercises, T or W, 2-4.30. Roberts Hall 392. Miss STRYKE and Mr. COUTANT.

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 courses 4 and 5. When possible the laboratory work will utilize materials collected by the student in the field. Laboratory fee, \$1.50.

4. **Elementary Morphology of Insects.** Credit three hours. Laboratory open daily except S, 8-5. Roberts Hall 391. Miss STRYKE 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; may advantageously be preceded or accompanied by course 10. Laboratory and field work, Monday and Wednesday afternoons, or other hours by special arrangement. Roberts Hall 301. Miss STRYKE and Mr. ———.

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.

12. **Taxonomy of Insects.** Credit four hours. Prerequisite courses 3, 4, 5, 10, 11, and 20, or the equivalent. Lectures, F, 8. Laboratory, hours to be arranged. Roberts Hall 392. Professor NEEDHAM, Assistant Professor MATHESON, Miss STRYKE, Mr. LLOYD, and cooperating specialists.

This course will continue through a number of terms, but the work of each term may be elected independently. It is intended primarily for graduate students who desire a systematic survey of one or more of the orders of insects and a practical working knowledge of them. Selected representative species will be studied in the laboratory, and the student will have opportunity to become acquainted with the particular methods of study applicable to the groups concerned, and with the technic and literature of each. The lectures will deal with the general aspects of the taxonomy of each group, its origin and distribution, its more generalized forms, and its chief lines of specialization, and data will be drawn freely from the fauna of the world at large, from developmental stages, and from the known fossil forms.

C. Myriapoda and Arachnida. Miss STRYKE.

[F. Neuropteroids. Third term, 1916. Professor NEEDHAM and Mr. LLOYD.] Not given in 1914-15.

19. **Research in Systematic Entomology.** Credit three or more hours. Prerequisite courses 3, 4, 5, 10, 11, 14, and 20. Laboratory open daily except S, 8-5, S, 8-1. Roberts Hall 301. Professors NEEDHAM and JOHANNSEN.

Special work arranged with reference to the needs and attainments of each student. Laboratory fee, 50 cents 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. Roberts Hall 391. Professors W. A. RILEY and NEEDHAM.

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

40. **Advanced Economic Entomology and Insectary Methods.** Credit two hours. Open only to graduates. Seminary, T, 2-4.30. Field and laboratory work by appointment. Insectary. Assistant Professor MATHESON.

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 HERRICK and Assistant Professor MATHESON.

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

50. **General Limnology.** Credit two hours. Open only to students who have taken or are taking course 3 and Biology 1, or the equivalent. Lectures, Th, 8. Roberts Hall 392. Laboratory, Th, 2-4.30. Roberts Hall 492. Professor NEEDHAM and Mr. LLOYD.

An introduction to the study of the life of inland waters. Aquatic organisms in their qualitative, quantitative, seasonal, and ecological relations. Laboratory fee, \$2.50.

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

Seminary. M, 4.30-5.30. Roberts Hall 392.

The work of an entomological seminary is conducted by the Jugatae, an entomological club which meets for the discussion of the results of investigations. Attendance at the meetings may be counted as laboratory work.

FARM CROPS

2. **Cereal Crops.** Credit two hours. Prerequisite course 1. Lectures, T Th, 8. Roberts Hall 292. Professor MONTGOMERY and Mr. DYNES.

An advanced course dealing with the principal cereal crops, based largely on a study of literature and experimental data.

3. **Forage Crops.** Credit two hours. To be preceded by course 1. Lectures, T Th, 10. Agronomy Building 192. Professor MONTGOMERY and Mr. DYNES.

An advanced course. Lectures and recitations on the character, use, and production of the principal forage plants, and the management of meadows and pastures, based on study of literature and experimental data.

5. **Seminary.** Without credit toward graduation. Required of graduate students. Professor MONTGOMERY.

6. **Research.** Credit two or more hours. Prerequisite permission to register. Limited to graduate students. Professor MONTGOMERY.

FARM MANAGEMENT

2. **Farm Management.** Credit four hours. Open to students who have passed the farm practice examination. This course is designed for students who have had considerable farm experience. It should be taken near the end of the student's college course. Lectures, M W F, 10. Soil Technology Building 100. One laboratory period a week, T, 2-4.30. Farm Management Building 102. On days when farms are visited, laboratory work may last longer than two and one-half hours. Assistant Professor THOMPSON.

Lectures, recitations, and laboratory practice. Farming as a business; labor income; size, diversity, and production of business; regions and types of farming; cropping systems; farm layout; building arrangement; efficient use of labor, horses, and machinery; marketing; forms of tenures and leases; organization and management of successful farms; ways of starting farming; use of capital and credit; choosing and buying a farm; planning, organization, and management of specific farms. A one-day excursion to farms at some distance from Ithaca will be made about September 5. Laboratory fee, \$1.

FARM PRACTICE

1. **Farm Practice.** Without credit toward graduation. Hour and place by appointment. Professor STONE and Mr. MOULTON.

An elective course designed to assist students in meeting the requirements in farm practice demanded by the College. In order to meet these requirements, students must have a practical knowledge of horses, cattle, sheep, swine, poultry, crops, farm machinery, orcharding, gardening, butter and cheese making, and the like. 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, or entomology, 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 as assigned within the first three weeks of their first term in the College.

FLORICULTURE

3. **Commercial Floriculture.** Credit four hours. Prerequisite course 1 or commercial experience, and course 2. Lectures and recitations, M W F, 10. Practice, W, 2-4.30. Greenhouses. Assistant Professor LUMSDEN.

Studies in the propagation and culture of florists' crops. As far as possible, practical work will be given in the propagation and culture of roses, carnations, violets, orchids, and other plants grown for commercial purposes. Methods of packing, shipping, and marketing will be considered. Laboratory fee, \$2.

5. **Greenhouse and Garden Practice.** Credit one or two hours. Prerequisite course 1, and permission to register. Practice by appointment. Greenhouses and gardens. Professor WHITE and members of the staff.

Designed to give students a wider experience in the practice of flower growing. The course consists of practical work in all branches of greenhouse management. Reports of work done are required.

8. **Garden Flowers.** Credit three hours. Lectures, T Th, 10. Practice, T or Th, 2-4.30. Greenhouses and gardens. Assistant Professor LUMSDEN and Mr. THAYER.

A study is made of the identification, propagation, and culture of annuals, herbaceous perennials, and roses. It is aimed 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 this class will be required to participate in an excursion to the Thompson estate at Canandaigua on August 14. Laboratory fee, \$2.

9. **Amateur Floriculture.** Credit two hours. Lectures, F, 11. Practice, S, 10.30-1. Greenhouses. Mr. PATCH.

The propagation and culture of potted plants in the home—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 it is open to any one desiring information regarding simple methods of plant culture. Laboratory fee, \$2 a term.

12. Investigation in Floriculture. Credit one, two, or three 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.

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

FORESTRY

The first six weeks of the summer term will be spent at Ithaca; the remainder of the term will be spent in camp on a forest tract, in the Adirondacks in the summer of 1915.

The following courses of instruction will be offered:

Group A

Forestry 9	Forest Utilization
Forestry 11	Forest Mensuration
Forestry 14	Silviculture: Forest Ecology
Forestry 15	Silviculture: Natural Reproduction and Care of the Forest

Group B

Forestry 20	Forest Management
Forestry 22	Seminary
Forestry 23	Advanced Work
Forestry 24	Research

For the professional forestry students, the courses in group A will constitute the first term's work of the senior year. During the following term, these students are expected to obtain the required practical experience, returning to Ithaca to complete undergraduate work in the second term. Courses in group B are offered for graduate students.

Courses 9, 11, 14, 15, and 20 will hereafter be given for professional forestry students during the third, or summer, term only, because of the obvious advantages of the season and place of work.

In the following program, the designated hours and rooms apply to work in Ithaca. A special camp schedule is to be arranged.

9. Forest Utilization. Credit four hours. Lectures, M T W Th F, 11. Forestry Building 122. Practice in forestry camp latter part of term. Professor RECKNAGEL.

The principal industrial uses of timber; logging methods and equipment; logging in representative regions; manufacture of lumber; determination of stumpage values; timber sale contracts; timber sale administration, including marking, brush disposal, and scaling in practice; minor industries; utilization of forest products other than wood, as grazing range, fish and game, and the like.

11. Forest Mensuration. Credit five hours. Lectures, M T W, 8. Forestry Building 126. Practice, M, 2-4.30. Forestry Building 118, and in camp. Assistant Professor BENTLEY.

Measurement of logs and standing timber; timber cruising; study of the rate of growth of timber; volume and yield tables. Laboratory fee, \$1.50.

14. **Silviculture: Forest Ecology.** First six weeks. Credit three hours. Prerequisite Botany 1 or its equivalent. Lectures, M T W Th F, 10. Forestry Building 122. Practice, W, 2-4.30, S, 8-1. Forestry Building 8. Professor SPRING.

The influence of site on the forest and of the forest on site; the behavior of trees as members of a forest community. Laboratory fee, 50 cents.

15. **Silviculture: Natural Reproduction and Care of the Forest.** Last ten weeks. Credit three hours. Prerequisite courses 13 and 14. Lectures and practice to be arranged. Professor SPRING.

A technical discussion of the silvicultural systems as practiced in Europe, and the possibility of using them in each of the forest regions of the United States and Canada; improvement cuttings, thinning and underplanting; marking timber for cutting. Laboratory fee, 50 cents.

20. **Forest Management.** Credit five hours. Open only to graduate students. Lectures, daily, 9. Forestry Building 126. Practice in forestry camp. Professor RECKNAGEL.

Forest organization, including foundations of working plans; regulation of yields, and the formulating of working plans; forest finance, including forest valuation (the ascertainment of values) and forest statics (the comparison of values).

22. **Seminary.** Credit two hours. Open only to graduate students. Hours to be arranged. Forestry Building 126. Professors HOSMER, SPRING, RECKNAGEL, and MOODY, and Assistant Professor BENTLEY.

23. **Advanced Work.** Credit two or more hours. Open to undergraduate and graduate students who have had the necessary training. Hours by appointment. Professors HOSMER, SPRING, RECKNAGEL, and MOODY, and Assistant Professor BENTLEY.

Individual advanced study of designated topics.

24. **Research.** Credit three or more hours. Open only to graduate students who have had the necessary training. Hours by appointment. Professors HOSMER, SPRING, RECKNAGEL, and MOODY, and Assistant Professor BENTLEY.

LANDSCAPE ART

13. **Elements of Planting Design.** Credit five hours. Prerequisite Botany 1. Lectures, T, 9. Practice and field trips with criticism, M W F, 2-4.30, W, 9-12.30. Landscape Art Building. Assistant Professor CURTIS.

A study of the identification and characteristics of trees, shrubs, and vines used in landscape planting, together with the elementary principles of their composition.

This work has been planned in consultation with the Departments of Drawing and Floriculture, so that a total registration of 13 hours may be secured as follows: Floriculture 3 hours, Drawing 5 hours, Landscape Art 5 hours. This instruction enters into the regular Landscape Art schedule and carries full-term credit toward graduation. Laboratory fee, \$1.

PLANT BREEDING

6. **Plant Breeding.** Credit four hours. Prerequisite Biology 1, and Botany 1 or Zoology 1. Lectures, W F, 12. Recitations, M, 12. Practice, Th, 2-4.30.

Forestry Building, Plant Breeding Laboratory. Assistant Professor BARKER and Mr. FRIEDMAN.

A general introductory course treating of variation, the laws of heredity, and selection. Equivalent to courses 1 and 2. Laboratory fee, \$3.

PLANT PATHOLOGY

1. **Plant Pathology.** Credit one, three, or four hours. Prerequisite Botany 1 or its equivalent. Lectures, W, 12. Recitations, F, 12. Home Economics Building 100. Practice, W F, 2-4.30. Bailey Hall, West Basement. (If registration warrants, additional recitation and practice sections will be offered: recitations, T, 12; practice, Th, 2-4.30, S, 8-10.30.) Students registering for three hours will omit the lectures. Students who have previously had the practice and recitations may register for the lectures only. Professor WHETZEL, Assistant Professor HESLER, and Messrs. CHUPP and HENDRICKS.

A fundamental course treating of the nature, cause, and control of plant diseases, illustrated by studies on some of the more common diseases of cultivated crops. A prerequisite for all other courses in plant pathology. The practice work must be taken in the couplets announced above. Laboratory fee, \$4.50; breakage deposit, \$2.

2. **Principles of the Control of Plant Diseases.** Credit three hours. Prerequisite course 1. Recitations, Th, 12. Practice, Th, 2-4.30, S, 10.30-1. Bailey Hall, West Basement. Assistant Professor HESLER and Messrs. CHUPP and HENDRICKS.

A consideration of the principles and the methods of the control of plant diseases. This will include studies on exclusion by laws, regulations, quarantine, and inspection; eradication by pruning, seed selection, tree surgery, rotation, disinfection; protection by spraying, dusting, wound dressing; immunization by selection, breeding, feeding, cultivation. Laboratory fee, \$4.50; breakage deposit, \$2.

6. **Parasitic Plants and Parasitism.** Credit three hours. Prerequisite Botany 1 or its equivalent. Lectures, M, 12. Practice, M T, 2-4.30. Bailey Hall, West Basement. Professor WHETZEL and Assistant Professor HESLER.

A consideration of parasitism as exhibited among plants and illustrated by comparative studies on the structure, life history, and classification of representative plant parasites and their saprophytic relatives. While the course is planned to cover the whole range of plant parasites from slime molds and bacteria to flowering plants, inclusive, the greater part of the time is devoted to the fungi. A general course for undergraduates. Laboratory fee, \$4.50; breakage deposit, \$2.

20. **Research.** Not less than three hours. Professors WHETZEL and REDDICK, and Assistant Professors STEWART and HESLER.

POMOLOGY

1. **Principles in Pomology.** Credit three hours. Prerequisite Biology 1 or Botany 1. For regular students only. Lectures, T Th, 10. Roberts Hall 131. Recitations, F, 10. Roberts Hall 292. Professor WILSON and Mr. OVERHOLSER.

A study of fundamental principles in pomology; cuttings, layers, budding, grafting, tillage, cover crops, fertilizing, pruning, spraying, and thinning. These topics are considered in their broadest sense, without application to any particular fruit.

1a. Pomology, Elementary Course. Credit one hour. Prerequisite course 1, and Biology 1 or Botany 1. For regular students only; required of students taking the advanced courses in pomology. Laboratory course to follow course 1. M, 2-4.30. Roberts Hall 202. Professor WILSON and Mr. OVERHOLSER.

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

4. Small Fruits. Credit one hour. Prerequisite course 1 or 16. Lectures and discussions, M, 10. Roberts Hall 202. Professor WILSON and Mr. OVERHOLSER.

A course which considers the grape, raspberry, blackberry, dewberry, currant, gooseberry, and strawberry. The topics discussed are soils, varieties, propagation, planting, culture, picking, grading, packing, and marketing.

10. Systematic Pomology. Credit two hours. Prerequisite courses 1, 1a, 2, and 8. Lectures or recitations, F S, 8. Roberts Hall 232. After September 1 a laboratory period, S, 8-10.30, is substituted for the Saturday lecture. Professor WILSON and Mr. OVERHOLSER.

A course designed primarily for graduates and students who are preparing to do experimental work. A study of the characters and botanical relationships of the fruits of the United States. Each student is required to collect and mount a number of varieties and species.

19. Research. Credit one or more hours. Prerequisite courses 1, 1a, 2, and 8, and Plant Physiology 20. Roberts Hall 202. Professor WILSON.

Original investigation of problems in pomology. A typewritten and bound thesis is required.

POULTRY HUSBANDRY

1. Poultry Husbandry. Credit three hours. Lectures, T Th, 11. Poultry Building 375. Practice, W, 2-4.30. Poultry Building 300. Professor RICE, Assistant Professor BENJAMIN and Mr. CHARLES.

An introductory and prerequisite course for students desiring to take specialized courses in poultry husbandry. This course must precede courses 1a, 4, 5, 7, 7a, 8, 11, and 12. The course considers the anatomy and physiology of poultry; the study of the egg; embryology; nomenclature; bibliography; environmental conditions; the history and scope of poultry husbandry.

2. Feeding and Care. Credit one hour. Must be preceded or accompanied by courses 1 and 1a, or by course 10, and preferably also by Animal Husbandry 1. Time arranged by appointment. Practice, three short periods a day, including Sunday, for four weeks: morning, 7.45-8.30; noon, 12.45-1.15; night, 4.30-5. Poultry Building. Professor RICE and Mr. ANDREWS.

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 courses 1 and 1a, or by course 10. Time arranged by appointment. Practice, three short periods a day, including Sunday, for four weeks: morning, 7.45-8.30; noon, 12.45-1.15; night, 4.30-5. Poultry Building. Professor RICE and Mr. BUCHAN.

Practice in operating incubators; testing eggs, keeping records, and taking apart and setting up machines. Assigned reading and a written examination will be required.

3a. **Brooder Practice.** Credit one hour. Must be preceded or accompanied by courses 1 and 1a, or by course 10. Time arranged by appointment. Practice, three short periods a day, including Sunday, for four weeks: morning, 7.45-8.30; noon, 12.45-1.15; night, 4.30-5. Poultry Building. Professor RICE and Mr. BUCHAN.

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 or two hours. Must be preceded or accompanied by course 7. Time arranged by appointment. Poultry Building. Assistant Professor BENJAMIN and ———.

This course is to accompany or supplement course 7, Marketing, for those who desire additional instruction in this subject. The work will include the preparation of poultry and poultry products for market; killing, picking, drawing, caponizing, and packing poultry; testing, candling, grading, packing, and shipping eggs.

10. **Farm Poultry.** Credit three hours. Lectures, M W, 11. Poultry Building 375. Laboratory, M, 2-4.30. Poultry Building 300. Professor RICE, Assistant Professor BENJAMIN, and Messrs. KENT, DANN, and CHARLES.

A brief course dealing with the practical application of the principles of poultry husbandry. For persons who do not specialize in this subject.

11. **Seminary.** Credit one to three hours. Prerequisite course 1; must be preceded or accompanied by courses 1a, 2, 3, 3a, 4, 5, 7, and 8; can best be taken in the last year by special students and in the senior year by regular students. M, 4.45-5.45. Poultry Building 325. Professor RICE, Assistant Professor BENJAMIN, and Messrs. KENT and DANN.

12. **Research.** Credit one to three hours. Prerequisite course 1; must be preceded or accompanied by courses 1a, 2, 3, 3a, 4, 5, 7, 8, and 11. Hours by appointment. Poultry Building. Professor RICE, Assistant Professor BENJAMIN, and Messrs. KENT and DANN.

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

RURAL EDUCATION

Seminary. In case there is sufficient demand, the Departments of Farm Crops and Rural Education will conduct a joint seminary dealing with the selection, organization, and presentation of subject matter with special reference to agronomy.

RURAL ENGINEERING

3. **Farm Mechanics.** Credit three hours. Students are urged to take Drawing 1 in preparation for this course. Lectures, W, 8. Soil Technology Building 100. Recitations, F, 8. Forestry Building 126. Practice, 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, spray nozzles, spraying outfits, water-supply outfits. B—Implements, including mowers and binder attachments, with a discussion of the special mechanical features of some of these implements now on the market. Laboratory fee, \$2.

19. **Research in Farm Mechanics.** Credit one or more hours. Prerequisite course 3 or its equivalent, and permission to register, together with natural ability in mechanical practice. Professor H. W. RILEY.

Special work in farm mechanics on problems under investigation by the Department or of special interest to the student, provided, in the latter case, that the Department can furnish adequate facilities.

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. Soil Technology Building 143. Practice, W, 2-4.30. Soil Technology Building 250. Mr. STRAHAN.

A study of the practical solution of the elementary problems involved in connection with surveying and mapping the farm; locating, digging, and laying 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. Attention will also be given to concrete construction, the design of simple structures, and estimates of their cost. Laboratory fee, \$2.

28. **Farm Engineering, Advanced Course.** Credit two or more hours. Prerequisite course 20 or its equivalent, and permission to register. Lectures, M, 8. Soil Technology Building 250. Practice, one problem as assigned. Assistant Professor ROBB and Mr. STRAHAN.

30. **Farm Structures.** Credit three hours. Prerequisite Drawing 1 or its equivalent. Lectures, T Th, 12. Soil Technology Building 100. Practice, S, 8-10.30. Rural Engineering Building. 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. Soil Technology Building 100. One laboratory period a week, daily, 2-4.30. Soil Technology Building 49. One recitation every two weeks by appointment. Students must consult the Department in regard to laboratory and recitation appointments before registering for the course. 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 in practice designed to demonstrate fundamental physical relations. Laboratory deposit, \$3.

5. Soil Surveying. Credit two hours. Prerequisite Soils 1 and Physical Geography 5. Practice, S, 8-1. Field, and Soil Technology Building 143. Assistant Professor BUCKMAN.

A course designed to provide the practical, as well as the technical and theoretical, phases of soil survey. The preparation of base maps and reports will be a feature of the course. Detailed as well as extended soil mapping will be studied. A good field knowledge of glacial geology is necessary for this work.

6. Soils, Advanced Course. Credit two hours. Prerequisite Soil Technology 1, and Chemistry 85 and 85a. Lectures, M W, 9. Soil Technology Building 143. Professor BIZZELL. Students should consult Professor Bizzell before electing this course.

An advanced course designed particularly for students specializing in soil technology. The lectures will deal with the important properties of soils from the theoretical and technical standpoints. The review of literature and preparation of papers will be an important part of the work.

11. Research. For graduate students only. By appointment. Soil Technology Building. Professor BIZZELL. Three graduate students may register for their major subjects with Professor LYON.

14. Seminary. Without credit toward graduation. Open to seniors who have had course 6, and required of graduate students. Soil Technology Building. Professors LYON, FIPPIN, and BIZZELL, and Assistant Professors BUCKMAN and WILSON.

VEGETABLE GARDENING

3. Commercial Vegetable Gardening. Second and third terms, credit three hours a term. Open only to students who have had the work in the second term. Prerequisite Botany 1 and Soils 1. Lectures, M W, 8. Practice, M, 2-4.30. Poultry Building 325, vegetable greenhouses, and gardens. Mr. WORK.

A course covering essentially the same ground as course 2, but considering the problems more thoroughly. The time of this course corresponds with the growing season for the crops, and the student is in touch with plantings of the leading vegetables in the departmental gardens. This affords excellent practice in the care, harvesting, and marketing of the products. Each student is assigned a small garden plot which he cares for throughout the two terms. Several short excursions are made to near-by market gardens. During the summer term there will be a one-, two-, or three-days trip to some of the most important vegetable-growing centers in the State, the cost of which will be \$10 to \$15; exact date to be arranged. Laboratory fee, \$2 a term.

5. Systematic Vegetable Crops. Credit three hours. Prerequisite course 3, or in special cases course 2, and permission to register. Lectures, F, 8. Poultry Building 325. Laboratory, T Th, 2-4.30. Vegetable gardens at East Ithaca. Messrs. WORK and KENERSON.

Lectures and descriptive studies dealing with vegetable crops, their origin and botany. Special attention will be given to the varieties of the different vegetables, to their characteristics and their adaptation to different cultural and market conditions, and to judging and exhibition work. 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. A judging trip to State Fair at Syracuse will be required. Each student makes a special systematic study of a crop or a group of crops, and presents a typewritten and bound report. Laboratory fee, \$2.

6. **Practice.** One or two hours, without credit toward graduation. 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 greenhouses and gardens.

7 **Vegetable Gardening, Advanced Course.** Credit two or more hours, by arrangement. Prerequisite course 3 and permission to register. Poultry Building 232. Mr. WORK and assistants.

A special problem, to be arranged; occasional short excursions. A typewritten and bound report of the special problem is required. Laboratory fee according to the nature of the problem.

OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

Issued at Ithaca, New York, monthly from July to November inclusive, and semi-monthly from December to June inclusive.

[Entered as second-class matter, August 31, 1910, at the post office at Ithaca, New York, under the Act of July 16, 1894.]

These publications include

The Annual Register (for the year 1914-15, published January 15, 1915), price 50 cents.

Catalogue Number for 1913-14 (containing lists of officers and students), price 25 cents.

Book of Views, price 25 cents.

Directory of Faculty and Students, Second Term, 1914-15, 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, January 1, 1915.

Announcement of the College of Arts and Sciences, May 1, 1914.

Announcement of Sibley College of Mechanical Engineering and the Mechanic Arts, February 1, 1915.

Announcement of the College of Civil Engineering, March 1, 1915.

Announcement of the College of Law, July 1, 1914.

Announcement of the College of Architecture, May 15, 1914.

Announcement of the New York State College of Agriculture, June 1, 1914.

Announcement of the Winter Courses in the College of Agriculture, June 15, 1914.

Announcement of the Department of Forestry, August 1, 1914.

Announcement of the Summer Term in Agriculture, April 15, 1915.

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

Announcement of the Graduate School, February 15, 1915.

Announcement of the Summer Session, April 1, 1915.

Annual Report of the President, October 1, 1914.

Pamphlet on prizes, samples of entrance and scholarship examination papers, special departmental announcements, etc.

Announcement of the Medical College may be procured by writing to the Cornell University Medical College, Ithaca, New York.

Correspondence concerning the publications of the University should be addressed to

The Secretary of Cornell University,
Ithaca, New York.