

CORNELL UNIVERSITY OFFICIAL PUBLICATION

Announcement of
Winter Courses

in the New York State
College of Agriculture

for 1939-40



VOLUME 30 : MAY 15, 1939 : NUMBER 19

CALENDAR OF THE WINTER COURSES, 1939-40

Nov. 1	Wednesday	Registration in winter courses, beginning at 9 a. m., at the office of the Secretary, Roberts Hall.
Nov. 2	Thursday	Instruction begins in winter courses.
Nov. 2	Thursday, 4 p.m.	General assembly of all winter-course students, Roberts Assembly.
Nov. 13	Monday	Fee cards issued by office of the Secretary.
Nov. 18	Saturday	Last day for payment of fees at office of the University Treasurer, Morrill Hall. (Before 1 p. m.)
Nov. 30-Dec. 2		Thanksgiving recess.
Dec. 20	Wednesday, 4 p.m.	Instruction ends.
Jan. 4	Thursday, 8 a.m.	Instruction resumed.
Feb. 9	Friday	Instruction ends in winter courses.
Feb. 12-17		Thirty-third Annual Farm and Home Week.

CORNELL UNIVERSITY OFFICIAL PUBLICATION

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WINTER COURSE STAFF

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Carl Edwin Ladd, Ph.D., Dean of the College of Agriculture and Director of Experiment Stations.
Cornelius Betten, Ph.D., D.Sc., Director of Resident Instruction and Dean of the University Faculty.
Lloyd R. Simons, B.S., Director of Extension and Professor of Extension Teaching.
Charles Arthur Taylor, B.S., Professor in Extension Service, in charge of Winter Courses.
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Cedric Hay Guise, B.S., M.F., Professor in Personnel Administration in charge of Admissions.
John Parker Hertel, Ph.D., Assistant Professor in Personnel Administration and Secretary of the College.
Willard Waldo Ellis, A.B., LL.B., Librarian.
George Wilson Parker, Bursar.

Raymond Clayton Allen, Ph.D., Instructor in Floriculture.
Elmer William Alvord, Foreman in Dairy Industry.
Floyd Edward Andrews, Foreman in Poultry Husbandry.
Willis Harrison Ashton, Extension Assistant in Agricultural Engineering.
Winfred Enos Ayres, Assistant Professor of Dairy Industry.
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Frank Pores Bussell, Ph.D., Professor of Plant Breeding.
William LaMar Cogshall, B.S., Assistant in Apiculture.
Herrell Franklin DeGraff, B.S., Assistant in Farm Management.
Daniel Harden Deyoe, M.D., D.N.B., Assistant Professor of Hygiene and Assistant Medical Adviser.
Karl Hermann Fernow, Ph.D., Extension Assistant Professor in Plant Pathology.
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- Robert Byron Hinman, Ph.D., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station.
- Lewis Merwin Hurd, Extension Assistant Professor of Poultry Husbandry.
- Burton Aaron Jennings, B.S., Professor of Agricultural Engineering and Agricultural Engineer in the Experiment Station.
- Curtis Gilbert Keyes, M.S., Instructor in Ornamental Horticulture.
- Josiah Randall Livermore, Ph.D., Associate Professor of Plant Breeding and Associate Plant Breeder in the Experiment Station.
- William Manning, Mechanic in Dairy Industry.
- Richard Alan Mordoff, Ph.D., Professor of Meteorology.
- Everett Franklin Phillips, Ph.D., D.Sc., Professor of Apiculture and Apiculturist in the Experiment Station.
- Philip Adna Readio, Ph.D., Professor of Economic Entomology and Entomologist in the Experiment Station.
- Arthur Bernhard Recknagel, B.A., M.F., Professor of Forest Management and Utilization.
- Louis Michael Roehl, B.S., Professor of Farm Mechanics.
- Harold Ellis Ross, M.S.A., Professor of Dairy Industry.
- Glenn Wade Salisbury, Ph.D., Assistant Professor of Animal Husbandry and Assistant Animal Husbandman in the Experiment Station.
- James Morgan Sherman, Ph.D., Professor of Dairy Industry and Bacteriologist in the Experiment Station.
- Earl Young Smith, B.S., Extension Assistant Professor in Poultry Husbandry.
- Myron Tompkins Van Etten, Assistant in Dairy Industry.
- Hezekiah Goodwin Webster, B.S., Assistant in Dairy Industry.
- John Peter Willman, Ph.D., Associate Professor of Animal Husbandry and Associate Animal Husbandman in the Experiment Station.

NEW YORK STATE COLLEGE OF AGRICULTURE

THE WINTER COURSES

The winter courses begin on November 1, 1939, and close on February 9, 1940. Instruction begins at 8 a. m. on November 2. The Thanksgiving Day recess includes November 30 to December 3, and the Christmas vacation extends from December 20, at 4 p. m., to January 4, at 8 a. m.

Correspondence concerning these courses and other instruction in the College of Agriculture may be addressed to the Secretary, College of Agriculture, Cornell University, Ithaca, New York.

There are no examinations for admission. However, in order that the student may be able to make the best use of the instruction, it is necessary that he should have had a good common-school education.

Tuition is free to those who are, and have been, bona-fide residents of New York State for one year previous to registration. Non-residents pay a tuition fee of \$25.

DESCRIPTION OF THE WINTER COURSES

The six twelve-weeks courses given are as follows:

1. General Agriculture.

For those who are interested in general crop growing and dairy farming (page 5).

2. Dairy Industry.

For those who wish to operate milk plants (page 9).

3. Poultry Husbandry.

For those who wish to operate poultry plants (page 12).

4. Fruit Growing.

For those who wish to engage in commercial fruit growing (page 13).

5. Flower Growing.

For those who wish to engage in commercial flower growing and flower marketing (page 14).

6. Vegetable Crops.

For potato growers and market gardeners (page 14).

1. COURSES IN GENERAL AGRICULTURE

Those persons who expect to engage in general farming or hope to be employed as herdsmen, or managers on dairy farms, or on farms on which diversified agriculture is practiced, usually choose the courses in general agriculture (pages 5 to 9). Persons who plan to specialize in milk-plant operation, poultry husbandry, fruit growing, flower growing, or vegetable crops, will register in one of the professional courses (pages 9 to 15).

In planning his schedule each student should examine the following courses with great care and should choose those which will best meet

his needs in the light of his interest and experience. All students enrolled in the Course in General Agriculture are required to include in their schedules the course Rural Health on Friday at 10 (page 8). The schedule determined upon should be submitted in the student's application. No student may take less than twelve hours or more than eighteen hours without permission of his faculty adviser.

AGRICULTURAL ECONOMICS

2. **Farm Management.** Three hours a week. It is suggested but not required that students registering in this course register also in course 3. Lectures, M Th 3. Warren 225. Laboratory, T or W 3-5. Warren 240. Mr. DEGRAFF.

Farming as a business; types of farming; farm records and accounts; size of business; rates of production; labor efficiency; farm layout; building arrangement; ways of starting farming; use of capital and credit; choosing and buying a farm; planning the organization and management of specific farms. Fee for materials furnished, \$2.50.

3. **Agricultural Business.** One hour a week. W 11. Warren 225. Mr. DEGRAFF.

Introductory discussions of farmers' cooperatives; certain marketing problems of New York farmers; credit agencies serving farmers; and insurance for farmers. Fee for materials furnished, \$1.

AGRICULTURAL ENGINEERING

1. **Farm Mechanics.** Three hours a week. Lectures, M W 4. Dairy Building 218. Practice, S 10-12.50. Agricultural Engineering Laboratory. Professor JENNINGS and Mr. ASHTON.

A course dealing with shafts, pulleys, belts, and pulley speeds; gasoline engines; pumps and water systems; knots and splices of ropes; care and adjustment of farm machinery. Laboratory fee, \$2.

5. **Farm Shop Work.** Two hours a week. Lectures, demonstrations, and practice, T W 10-12.50. Agricultural Engineering Laboratory. Professor ROEHL.

Practice in carpentry, saw filing, tool sharpening, fitting handles, soldering, black-smithing, cold-metal work, and harness repairing. Study is made of the plan and interior arrangement of the farm shop and of the selection, care, and use of the tools necessary for farm construction and general repair work. Students preparing for general farming are given opportunity to do blacksmithing, harness repairing, and so forth, and poultry students will construct poultry appliances and houses. Laboratory fee, \$3; for students in poultry husbandry, \$4.

AGRONOMY

4. **Soil Fertility.** Three hours a week. Lectures, M T W Th 2. Caldwell 100 and 143. Professors BUCKMAN and GUSTAFSON.

An elementary course dealing with those physical, chemical, and biological properties of the soil that have special practical applications. The use of lime, manures, and fertilizers is an important phase of the work.

5. **Field-Crop Production.** Four hours a week. Lectures, M W F 8. Caldwell 143. Laboratory, M 11-12.50. Caldwell 250. Professor HARTWIG.

A course dealing principally with the crops used for feeding livestock and poultry. Emphasis is placed on the hay, silage, pasture, and grain crops of New York. Practical cultural methods, crop rotations, fertilizer practices, soil and climatic adaptation, and the better varieties of the important feed crops are considered. Laboratory fee, \$1.

ANIMAL HUSBANDRY

1. **Feeds and Feeding.** Three hours a week. Lectures, T Th 9. Wing C. Practice, T 11-12.50. Mr. HANSON.

The principles and practices of compounding rations and of feeding farm animals.

2. **Principles of Breeding Dairy Cattle.** Three hours a week. Lectures, M W 9. Wing C. Practice, Th 11-12.50. Professor HARRISON and Mr. ———.

Dairy-cattle breeding; the dairy bull; care and management of the dairy herd; milk production; practice in judging and scoring.

3. **Horses, Beef Cattle, Sheep, and Swine Production.** Four hours a week. Lectures, T Th 8. Wing Hall. Livestock-judging laboratory, S 8-10, followed by a practice period until 12.30 in the actual feeding, care, and management of stock. Professor HINMAN, Associate Professor J. P. WILLMAN, and Assistant Professor SALISBURY.

Types, breeds, judging, and management of horses, beef cattle, sheep, and swine.

APICULTURE

1. **Beekeeping.** Elective by students in all courses. Two hours a week. Lectures, discussions, and demonstrations, M 10, F 11-1. Comstock 17. Professor E. F. PHILLIPS and Mr. COGGSHALL.

This course includes a general discussion of the work of handling bees during each of the seasons, and of the necessary seasonal operations, such as preparing bees for wintering, wintering methods, building up colonies in the spring, swarm control, supering, and disease control. It includes also a discussion of the chief characteristics of honey as a food.

DAIRY INDUSTRY

Students wishing to specialize in the operation of milk plants should enroll in the professional dairy course outlined on pages 9 to 12.

[8. **Farm Dairying.** For students in general agriculture only. Four hours a week. Professor GUTHRIE.] Not given in 1939-40.

Composition of milk; the Babcock test for fat in milk and its products; the care and handling of milk; the manufacture of farm dairy products, including the operation of cream separators, the making of butter, starters, some of the farm cheeses, and ice cream; dairy arithmetic; judging dairy products. Laboratory fee, \$5.

ENTOMOLOGY

1. **Injurious Insects.** Three hours a week. Lectures, T Th 9. Comstock 145. Laboratory, for students in Floriculture, S 8-10.20; for all others, F 1.40-4. Comstock 100. Professor READIO.

The common insect pests of farm, garden, orchard, and greenhouse, and of farm animals are discussed, and measures of control are carefully considered. Specimens of the insects discussed, together with examples of their work, are shown to members of the class whenever possible. Opportunity is given for questions and discussions, with the hope of clearing up obscure points and the various phases of the problems. The lectures and discussions are illustrated by lantern slides and by charts.

EXTENSION TEACHING

1. **Public Speaking.** Two hours a week. Lectures and discussions, T Th 8. Roberts 492. Criticism by appointment, daily 8-12.50 and 2-4. Mr. GOODRICH.

Practice in oral and written presentation of topics in agriculture, with criticism and individual conferences on the technic of public speech. The course is designed to acquaint students with parliamentary practice, to encourage interest in public affairs, and to train for effective self-expression in public. Open to all students in the winter courses.

FLORICULTURE

6. Gardening and Garden Flowers. Three hours a week. Lectures, T Th 10. Plant Science 37. Laboratory, W 9-11. Plant Science 15. Doctor ALLEN and Mr. WHEELER.

A course designed to study the methods of propagation and growing of outdoor annuals and herbaceous perennials. Studies are made, so far as possible, of individual garden problems. The culture of outdoor roses, asters, peonies, phlox, iris, and bulbous plants is considered. Laboratory fee, \$2.

FORESTRY

1. The Farm Woodlot. One hour a week. Lecture, laboratory, and field trips, M 10-12.30. Fernow 206. Professor RECKNAGEL.

A course to present the most important phases of woodlot forestry; characteristics of the principal trees of New York State woodlots; the methods of measuring standing timber; log scaling; the care and improvement of the woodlot; forest planting; the preservative treatment of farm timbers.

HYGIENE AND PREVENTIVE MEDICINE

1. Rural Health. One hour a week. Lecture, F 10. Comstock 145. Required of all students enrolled in General Agriculture. Assistant Professor DEYOE.

This course aims to acquaint the student with certain of the factors influencing the personal and community health of rural dwellers; also the possible effects of ill health of a dairyman or other producer on the consumer of his products.

Rural sanitation, the hygienic production of milk, meat, and their products, the county health unit, and home nursing, are among the subjects discussed.

METEOROLOGY

[1. The Weather and Weather Forecasting. Two hours a week. Professor MORDOFF.] Not given in 1939-40.

The principles and methods of practical weather forecasting from weather maps and local observations, and the more essential phases of meteorology and climatology and their relations to agriculture, are considered.

PLANT BREEDING

1. Plant Breeding. Three hours a week. Not given unless ten or more students register. Lectures and discussions, M 9-11 and F 9. Plant Science 146. Professor BUSSELL and Associate Professor LIVERMORE.

This course explains how plant breeding is done and why it is useful in maintaining or increasing yields of crop plants. The use and value of selection as a method of improvement is first considered. This is followed by a discussion of the crossing of plants and the part it plays in providing new and better varieties. Emphasis is placed upon seed values and upon seed certification as a further step in the practical application of breeding effort. A study of the mechanism of reproduction is included and is designed to equip the student to pursue intelligently further study and work in plant breeding if he so desires.

PLANT PATHOLOGY

1. Plant Diseases. Three hours a week. Lecture, S 9. Plant Science 336. Practice, T 10-12.50 and Th 10-11.50. Plant Science 342. Extension Assistant Professor FERNOW.

A course designed to give the student a better understanding of the nature and cause of plant diseases and how these are related to intelligent control. Certain typical diseases of economic importance are studied in detail, and the student is then given the opportunity of applying what he has learned to the study of diseases in which he is especially interested. Laboratory fee, \$1.50; breakage deposit, \$3.

POMOLOGY

2. **General Fruit Growing.** Four hours a week. Lectures, M T W Th 8. Plant Science 114. Mr. _____.

This lecture course is designed for students who desire a general knowledge of fruit growing, and who cannot schedule the laboratory work. Whenever possible the student is urged to register for course 1, as the laboratory work aids greatly in getting an understanding of the lecture material. (See page 13.)

POULTRY HUSBANDRY

1. **Poultry Husbandry, Lecture Course.** Four hours a week. Lectures, T Th F S 9. Poultry Husbandry Building 305. Members of the departmental staff.

A lecture course dealing with the practical application of the principles of poultry husbandry.

VEGETABLE CROPS

1. **Vegetable Crops.** Four hours a week. Lectures, M W F 4. East Roberts 222. Laboratory, S 10.30-12.50. Vegetable Greenhouses. Doctor GRIFFITHS.

A comprehensive survey is given of the vegetable industry of New York State. The problems of the market gardener, the vegetable forcer, the truck grower, the muck-land farmer, and the producer of canning crops, are taken up. Climatic adaptations, soils and soil management, varieties, seed, plant growing, cultivation, irrigation, grading, handling, and packing, are all considered in general, and with reference to the special crops.

The laboratory work includes exercises in plant growing, vegetable-variety studies, hotbed and coldframe construction and management, and the grading and handling of important vegetable crops. Laboratory fee, \$1.50.

VETERINARY MEDICINE

1. **Diseases of Farm Animals, and Veterinary Hygiene.** One hour a week. Lecture, F 9. Moore Laboratory 106. Professor GILMAN.

This course includes a discussion of the most common diseases of farm animals, especially cattle, the prevention and control of these diseases, and general questions of animal hygiene.

2. **Poultry Hygiene and Disease.** One hour a week. Lecture, M 9. Moore Laboratory 106. Assistant Professor BRUNETT.

The course deals with the nature of the infectious and parasitic diseases of poultry and with the principles of hygiene applicable to poultry farming, for the prevention and control of diseases.

2. COURSE IN DAIRY INDUSTRY

The course in dairy industry is intended especially for persons who plan to work in commercial dairy plants. It is *not* intended for persons who plan to follow dairy farming, nor for those preparing to occupy positions as herdsmen, or as testers in advanced registry work. Students wishing to qualify themselves for such work should enroll in general agriculture, taking such subjects as may be recommended by the faculty adviser.

Enrollment is limited to thirty-six. Early application is therefore desirable.

A meeting of all winter-course students in dairy industry will be held at three o'clock on the afternoon of registration day, November 1, in the Dairy Industry Building, room 119.

SPECIAL EXPENSES

In addition to the general expenses listed on pages 18 and 19, students in dairy industry have the following special expenses:

Laboratory fee, to pay for materials used and to cover laundry and breakage.	\$35.00
(Less than the full term: First period only, \$20; second period only, \$7.50 for each manufacturing subject taken.)	
Books	\$25.00-\$30.00
One suit of overalls, about	\$2.00
One rubber apron, about	\$1.00

At least two white suits, with caps, will also be needed for the work of the second period. The customary laboratory uniforms include white shirts with short sleeves and soft collars, white trousers with black belts, and washable white caps without visors.

Waterproof footwear is necessary for work in the dairy laboratories. Books, notebooks, and the special clothing listed above can be purchased in Ithaca.

METHODS OF INSTRUCTION

Instruction is given by means of actual practice in the different kinds of dairy work, supplemented by lectures, recitations, and reading assignments in dairy literature. Brief written examinations, and informal discussions of topics previously assigned for study, are frequently introduced.

The term is divided into two periods. The first is devoted to acquiring a knowledge of those subjects fundamental to a study of any dairy-manufacturing process. On this foundation the student, during the latter half of the course, develops his understanding of the various factors involved in the actual making or processing of dairy products.

FIRST PERIOD

November 1 to December 16 inclusive

The following lecture and practice courses are required during the first half of the term:

200. Testing and Composition of Dairy Products. Credit three hours. Lectures, T W Th 1. Room 120. Laboratories, T W Th 2-5. Room 209. Extension Professor BRUECKNER and Mr. WEBSTER.

This course involves a study of the composition of milk; laboratory practice in analysis, including the Babcock, Gerber, and Mojonnier methods; tests for acidity, salt, moisture, chemical sterilizers, and washing solutions; use of the lactometer; calculating milk solids; some of the simple tests for preservatives and adulterants.

201. Dairy Bacteriology. Credit three hours. M W F 10-12. Room 120. Professor SHERMAN.

The course considers the relation of bacteria to dairy work, their action on milk and its products, and methods of controlling their growth. Studies are made of the various bacteria commonly found in milk. This work is intended to acquaint the student with the important part played by bacteria in dairy products, rather than to train him in scientific procedure.

NEW YORK STATE COLLEGE OF AGRICULTURE AT CORNELL UNIVERSITY
APPLICATION FOR ADMISSION TO WINTER COURSES

Remove this application without separating the pages
Print name clearly, using pen and ink or typewriter

Name of applicant *IN FULL* Last name First name Middle name
Permanent home address (number and street, or R. F. D.)
Place County State
Date of birth, month day year
Nationality Married Date of this application
Name and address of parent or guardian, or person to be notified in case of serious illness or accident
.....
School or college attended (Indicate clearly the type of school or course)
Name of school Place Period of attendance
.....
.....
.....
.....
Have you received any degree or certificate? What? Where and when?
OVER

What has been your practical experience in farm work and in the special work covered by the winter course in which you are registering?

What has been your residence and occupation during the past five years?

Occupation 1935.....Place.....State.....

Occupation 1936.....Place.....State.....

Occupation 1937.....Place.....State.....

Occupation 1938.....Place.....State.....

Occupation 1939.....Place.....State.....

What church do you attend?

REFERENCES.*—I am personally acquainted with the above applicant, and know.....to be of good moral character, industrious, studious, and physically and otherwise capable.

Name.....Name.....

Position.....Position.....

Address.....Address.....

*Two endorsements are necessary, and should be preferably by your teacher and your pastor or a public official, not a member of your own family. These persons should sign the application themselves.

NOTE.—The applicant must answer ALL the questions asked on both sides of this application blank. When the blank has been answered in full, and the vaccination certificate has been filled out by your physician, mail them to the Secretary, College of Agriculture, Roberts Hall, Ithaca, New York.

Name..... Last name..... First name..... Middle name.....

SCHEDULE OF SUBJECTS

The applicant should make sure, by means of a form similar to the one shown below, that the subjects he wishes to take do not conflict in time. Most of the courses offer options in laboratory periods, so that, with the exercise of care, one can generally arrange to include the subjects desired.

Indicate by a check mark (✓) the one of the following six courses in which you wish to register. Do not check more than one course.

1. General Agriculture
2. Dairy Industry
3. Poultry Husbandry
4. Fruit Growing
5. Flower Growing
6. Vegetable Crops

If you intend to specialize in the professional course in dairy industry it is not necessary for you to fill out the remainder of the blanks on this page.

If you are registering in any of the other five courses, write below the number and name of each subject in which you desire to register, using the number given in the catalogue. Example: Subject **Agricultural Economics**. No. 2, 3 hours. Without special permission, no student is allowed to take less than twelve or more than eighteen "hours" of work.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	COURSES FOR WHICH CREDIT IS DESIRED	
							SUBJECT	NO. HRS.
8								
9								
10								
11								
12								
1								
2								
3								
4								

Vaccination Certificate

This certificate, or a similar one which is fully equivalent, must be filed with the rest of the application not later than October 31.

.....
Family name

.....
First name

I certify that the above-named applicant was vaccinated against smallpox by me on the following dates:

.....19.....

.....19.....

.....19.....

and that the result was

SUCCESSFUL { *Immune reaction*
 Vaccinoid
 Vaccinia
UNSUCCESSFUL

.....M. D.

.....
Post Office Address of Physician

All students matriculating in the University must present a certificate of vaccination against smallpox; this certificate is considered satisfactory only if it certifies to a successful vaccination within five years or certifies that at least three unsuccessful attempts have been made within the same period.

202. Dairy Chemistry. Credit one hour. Lectures, T Th S 8. Room 119. Professor HERRINGTON.

The elementary principles of chemistry are explained in order that the student may better understand the composition of dairy products and the chemical changes connected with and influencing dairy operations.

203. Dairy Arithmetic. Credit two hours. Recitations, and laboratory practice, T Th 9-12. Room 120. Professor ROSS.

A thorough drill is provided in such problems as are constantly arising in all kinds of dairy work and in the keeping of factory accounts.

204. Dairy Mechanics. Credit three hours. Lectures and recitations: M W 8-10, Room 120; F 8-10, Room 119. Laboratories, M F 1-5, S 9-1. Room 235. Assistant Professor AYRES and Messrs. ALVORD, VAN ETEN, and MANNING.

A lecture and laboratory course covering the principles and the operation, adjustment, and repair of dairy machinery, refrigeration equipment, steam engines, boilers, lubricating devices, and related apparatus. Practical laboratory work is given in the operation of cream separators and similar equipment, in the installation of shafts and pulleys, and in pipe fitting, belt lacing, and soldering.

ELIGIBILITY FOR THE SECOND PERIOD

During the last half of the term, laboratory courses in the manufacture of various dairy products will be conducted as listed subsequently.

Any student whose work in the first period has been of satisfactory grade, may enroll in any of the courses offered that do not conflict as to time.

These courses are open also to former students who have satisfactorily completed the work of the first half, and who wish to return and obtain additional training in dairy-manufacturing lines.

This privilege is extended also to persons who may already have received training elsewhere equivalent to the work of the first half of this course. Such persons will be expected to pass an entrance examination covering the subjects listed in the first half, as evidence of their fitness for admission; and a complete understanding between the candidate and the dairy department should be accomplished by correspondence before any move is made toward coming to Ithaca.

Fees covering enrollment of those not registered for the first half of the term are stated on page 10.

SECOND PERIOD

The following elective courses are offered, subject to the requirement that at least five students register for any desired course.

No student may take more than three subjects, as the work of any one course will occupy his entire time during the period scheduled.

December 18 to 20 and January 4 to 13 inclusive

205. Market Milk. Credit three hours. Laboratories, daily, 8-1. Room 128. Lectures, daily, 2. Room 120. Professor ROSS, Extension Professor BRUECKNER, and Messrs. ALVORD and VAN ETEN.

This course covers the sanitary construction of dairy barns; score cards for dairy barns and market milk; food value of milk; standardizing milk and cream; legal standards for milk and cream; dairy utensils; the general production and handling of clean milk. The laboratory work includes bottling; milk pasteuriza-

tion; different methods of cooling milk; clarification; standardization of milk and cream; judging milk and cream for sanitary quality; the making of cultured buttermilk and other milk drinks; the use of the sanitary score card in judging dairy barns and dairy plants.

January 15 to 27 inclusive

206. **Condensed and Powdered Milk.** Credit three hours. Laboratories, daily 8-1. Room 237. Lectures, daily 2. Room 120. Assistant Professor AYRES and Messrs. ALVORD and VAN ETEN.

This course considers the principles and practices of making condensed and powdered milk. Students make plain condensed, superheated, evaporated, and sweetened milks, and powdered whole milk, skimmilk, and buttermilk.

207. **Cheese.** Credit three hours. Lectures, daily, 8 M W, room 120, and T Th F S, room 119. Laboratories, daily 9-4. Room 122. Extension Professor BRUECKNER.

Instruction is given in the principles underlying the making of the common types of both hard and soft cheeses. Daily practice is conducted in the manufacture and judging of cheese and in the making and use of starters.

January 29 to February 9 inclusive

208. **Butter.** Credit three hours. Laboratories, daily, 8-1. Lectures, daily, 2. Room 139. Professor GUTHRIE.

This course deals with the principles involved in butter-making processes, and the practices followed in modern creameries. Training is given in judging and grading cream; standardizing acidity of cream; pasteurization; making cultured buttermilk and cultured sour cream; and the manufacture of butter from both sweet and ripened cream. This involves also the making and use of starters, and a study of cream-ripening methods. Practice in scoring and grading butter is included and consideration is given to the marketing of the finished products.

209. **Ice Cream.** Credit three hours. Laboratories, daily, 8-1. Room 237. Lectures, daily, 2. Room 120. Assistant Professor AYRES, and Messrs. ALVORD and VAN ETEN.

Lectures and recitations concerning the theories and principles related to the processing of materials and to the freezing operation are combined with daily practice in the making of ice creams, sherbets, and ices. Students are especially trained in the standardization of mixes and in the analysis of materials.

3. COURSE IN POULTRY HUSBANDRY

Persons expecting to take up poultry raising professionally should register in the course in poultry husbandry. Applicants must furnish evidence of having had at least six-months experience in working on an approved farm or poultry plant. The course is intended to assist in supplying trained poultrymen to take charge of poultry farms for themselves or for others. Although it is manifestly impossible in twelve weeks to give full preparation for so exacting a business as poultry keeping, this course will start the student in the right direction, enable him to avoid many mistakes, and offer him facts and principles of value gleaned from the experience, study, and observation of others.

REQUIRED SUBJECTS

Students planning to attend but one winter course should take the following subjects. Those who have not had practical farm experience had best plan a two-year program, spending the intervening period in work on a poultry farm.

1. **Poultry Husbandry, Lecture Course.** Four hours a week. Lectures, T Th F S 9. Poultry Husbandry Building 305. Members of the departmental staff.

A lecture course dealing with the practical application of the principles of poultry husbandry.

2. **Poultry Husbandry, Laboratory Course.** Five hours a week. Practice, M 11-1, T 2-4, Th 10-12.30, F 1.40-4. Poultry Husbandry Building 100. Mr. ANDREWS.

A laboratory course dealing with the practices of poultry husbandry, including: judging and selecting fowls; preparing poultry products for market; studying poultry rations; diseases and sanitation; and other poultry-management practices. One period each week is devoted to practice work in incubation and brooding. Laboratory fee, \$10.

3. **New York Market Inspection Trip (Optional).** One hour. A three-day trip to the New York City markets under the guidance of a member of the poultry department staff during or immediately following the Christmas vacation. Necessary expense need not exceed \$10 in addition to transportation to and from New York City.

	<i>Hours</i>
Agricultural Economics 2 (page 6).....	3
Agricultural Engineering 5 (page 6).....	2
Veterinary Medicine 2 (page 9).....	1
Elective.....	2 or 4

4. COURSE IN FRUIT GROWING

The course is intended to meet the requirements of persons engaged in commercial fruit growing. Lectures cover the relation of the fundamental sciences to the various orchard operations, and a digest of experimental work bearing on fruit growing. Special emphasis is placed on the interpretation of experimental work with reference to New York conditions. In the laboratory exercises each student will be given opportunity to perform all the orchard operations which the season will permit. The course should be of value to men who are preparing to become managers or foremen of fruit farms. Unless the student has had considerable previous experience, however, the course will not equip him for such a position.

REQUIRED SUBJECTS

Students planning to attend but one winter session should take the subjects that follow. Those without experience in fruit growing had best plan a two-years program.

1. **Commercial Fruit Growing.** Six hours a week. Lectures, M T W Th 8. Practice, W 9-12.50. Plant Science 114. Mr. —————.

This course includes a study of varieties, methods and principles of propagation; grafting; soils, and planting plans for the orchard, cultivation, cover crops, fertilization, pollination, pruning, and thinning as practiced in orchard management; picking, grading, packing, storing, and marketing fruit. The course considers the following: apple, pear, quince, cherry, plum, peach, grape, raspberry, blackberry, currant, gooseberry, and strawberry.

	<i>Hours</i>
Plant Pathology 1 (page 8).....	3
Entomology 1 (page 7).....	3
Agronomy 4 (page 6).....	3
Agricultural Economics 2 (page 6).....	3
Apiculture 1 (page 7).....	2

5. COURSE IN FLOWER GROWING

New York is distinctly a flower-growing State. Competition is keen among flower growers, and progressive young men realize that they must equip themselves with all the information possible if they are to make a success of the business. The course offered is for those especially interested in commercial floriculture; that is, in the production and the methods of distribution of cut flowers and ornamental potted plants grown under glass.

Interest in flower growing, however, is not confined to men engaged in the commercial industry. There is an increasing demand from amateurs for information regarding the culture of plants, especially annuals and perennials, to be used about the home, in the ornamentation of rural public buildings, and the school grounds. The course in garden flowers, as outlined on page 8, is planned to meet this demand. The following course is planned especially for persons who intend to engage in commercial greenhouse-flower production.

REQUIRED SUBJECTS

1. **Commercial Flower Production.** Five hours a week. M T W Th 8. Plant Science 22. Practice, F 8-12. Greenhouses. Mr. KEYES.

A study of the principles and methods of growing commercial florists' crops, such as roses, carnations, sweet peas, and potted plants. The first six weeks of the course are devoted to a study of plant growth and how the factors that influence growth are controlled and applied in the scientific production of cut flowers and potted plants. Detailed culture of particular crops is considered during the last six weeks of the course. The course is designed for either students who have or have not had greenhouse experience. Laboratory practice consists of familiarizing the student with the practical work of the greenhouse. One or more field trips to commercial greenhouses are taken during the course. Laboratory fee, \$4.

	<i>Hours</i>
Agronomy 4 (page 6)	3
Floriculture and Ornamental Horticulture 6 (page 8)	3
Entomology 1 (page 7)	3

ELECTIVE SUBJECTS

2. **Retail Flower Store Management.** Two hours a week. Limited to fifteen students. M 11. Practice, F 1-4. Plant Science 22. Mr. KEYES.

This course gives the student some knowledge of methods of retail-flower-store management, such as store equipment, salesmanship, business methods, delivery, decorating, artistic flower arrangement, and wholesale markets. Laboratory fee, \$7.

	<i>Hours</i>
Vegetable Crops 1 (page 9)	4
Forestry 1 (page 8)	1

6. COURSE IN VEGETABLE CROPS

An ever-increasing number of persons are looking to the growing of vegetables as a source of their income, both on specialized vegetable farms and in connection with other types of agriculture.

In view of this growing interest in vegetables, the Department of Vegetable Crops offers the following course intended to meet the

needs of persons who desire to obtain, in a short time, a knowledge of the fundamental principles and practices of vegetable growing, grading, handling, and storage. Application of these principles is made to different phases of vegetable production and handling.

This course is designed especially for students who have had some farm or garden experience. It should be of value to owners, and to those who plan to become managers or superintendents of specialized vegetable farms as well as to those who plan to grow or handle vegetables in a commercial way in conjunction with some other phase of agriculture such as general or dairy farming, fruit growing, or poultry farming.

Students are advised to consider the possibility of taking more than one winter's work in order to broaden their training and to learn more of contributing subjects. Opportunity would also be afforded to build combinations of courses embracing other fields as dairy, pomology, poultry, and others.

REQUIRED SUBJECTS

1. Commercial Vegetable Crops. Four hours a week. Lectures, M W F 4. East Roberts 222. Laboratory, S 10.30-12.50. Vegetable Greenhouses. Doctor GRIFFITHS.

A comprehensive survey is given of the vegetable industry in New York State. The problems of the market gardener, the vegetable forcer, the truck grower, the muck-land farmer, and the producer of canning crops, are taken up. Climatic adaptation, soils and soil management, varieties, seed, plant growing, cultivation, irrigation, grading, handling, and packing are all considered in general, and with reference to the special crops. The laboratory work includes exercises in plant growing, vegetable-variety studies, hotbed and coldframe construction and management, and the grading and handling of important vegetable crops. Laboratory fee, \$1.50.

For a one-year course the following are recommended:

	<i>Hours</i>
Agronomy 4 (page 6).....	3
Vegetable Crops 1 (page 9).....	4
Entomology 1 (page 7).....	3
Plant Pathology 1 (page 8).....	3
Elective.....	3 to 5

For a second year's work, choice among the following should be made:

	<i>Hours</i>
Agricultural Economics 2 (page 6).....	3
Plant Breeding 1 (page 8).....	3
Agricultural Engineering 1 (page 6).....	3
Meteorology 1 (page 8).....	2
Extension Teaching 1 (page 7).....	2
Other electives, as Pomology, Poultry Husbandry, Field Crops, Animal Husbandry, and so forth.....	2 to 5

SPECIAL UNIT COURSES

Various groups of farmers, or others, frequently find themselves confronted by common problems that arise out of occupations related to agriculture. To these and to persons who wish to prepare for cer-

tain specific positions, the College offers special unit courses of intensive study over periods of a few days or a few weeks. The instruction in these special unit courses is devoted solely to particular subjects with which the courses are concerned. These special unit courses or special schools and conferences vary from year to year.

During the past year, the following unit courses were among those presented: Annual Poultry Judging and Breeding School; Annual Conferences of Teachers of Agriculture and Home Economics; Summer School for Town and Country Ministers; Egg Grading and Marketing School; Newspaper Institute for Editors and Publishers; Landscape Training School; Annual Nutrition School; Short Course for Florists; School for Missionaries on Furlough; Annual Nurserymen's Conference; School for Town and County Highway Superintendents; Meat Cutters' School; Northeastern Poultry Producers' Council; Short Course for Municipal Milk Inspectors, and others.

GENERAL INFORMATION

ADMISSION

A certificate of vaccination against smallpox (see application sheet) is required of all students and is considered satisfactory only if it certifies to a successful vaccination within five years or certifies that at least three unsuccessful attempts have been made within the same period. This requirement does not apply to students who attend the special unit courses for periods not exceeding six weeks.

The winter courses are business and occupational courses, not academic; hence there are no examinations for admission. However, in order that the student may be able to make the best use of the instruction, it is necessary that he should have a good common-school education. Winter-course students are sometimes seriously handicapped in their work by being deficient in arithmetic and in English. Persons who are planning to take a winter course are advised to review these subjects before coming to Ithaca.

Women should correspond with the Dean of Women, Ithaca, New York, in regard to rooms and accommodations.

Age. All the courses are open to both men and women of at least eighteen years of age.

Application. This circular contains an application blank for admission to the winter courses, a blank vaccination certificate, and a schedule sheet for courses to be taken. These should be made out in full and forwarded to the Secretary at once by any person who plans to attend any one of the winter courses. The filing of an application for admission does not constitute an obligation to attend, and applications may be withdrawn at any time.

When making application, candidates for admission should give a complete description of their school training.

Arrival at Ithaca. Students who desire advice concerning lodgings and boarding places are invited to come directly to the College of

Agriculture on their arrival in Ithaca. It is desirable that all housing arrangements should be completed before registration day.

On November 2 at 4 p. m. all winter-course students will meet in Roberts Assembly for general directions and instructions.

REGISTRATION

On Wednesday, November 1, beginning at 9 a. m., all students must report for registration at the office of the Secretary of the College of Agriculture, Roberts Hall. Upon being registered, each student is assigned a faculty adviser to whom he goes at once, and with whom he will consult frequently, during his course, on either personal problems or matters pertaining to his course of study.

Study Cards. After the student has registered, he may not change his schedule of courses in any respect, except on the recommendation of the head of the winter course concerned or of his faculty adviser, and with the approval of the Secretary. The schedule of subjects, which the applicant fills out in advance, may subsequently be changed at the request of the applicant, and is not to be confused with the study card, which is made out when the student registers.

CERTIFICATES

Students who complete a schedule of at least fifteen hours with grades of 70 or better, and are in residence for the full term of twelve weeks, are given certificates of record. These certificates are mailed late in April to students entitled to them.

POSITIONS

The College does not promise to find positions for students registered in any of its courses, but it has opportunity to recommend students for a large number of positions. Some students who have completed a winter course have obtained an increase in salary in the following season sufficient to pay the entire cost of the course. Such results, while of course not guaranteed, show that there are excellent opportunities for trained men.

A student desiring a recommendation from the College must fulfill the following conditions: (1) he must be of good character; (2) his previous record must be good; (3) his work in the winter course must be satisfactory.

In the course in dairy industry, previous experience in a well-conducted dairy plant is strongly advised for those who expect the College to recommend them for positions.

In the course in poultry husbandry, it is recommended that persons inexperienced in the handling of poultry spend at least a year in acquiring practical knowledge of the business before entering this course. Students who have not previously had a considerable amount of farm or poultry experience cannot, as a rule, be recommended to positions of responsibility until they have spent a season on an ap-

proved poultry farm. This is particularly true for the better positions in which managers or superintendents are wanted to take charge of poultry farms.

EXPENSES

TUITION

Tuition is free to those who at the beginning of the course are, and for at least twelve months prior thereto have been, bona-fide residents of the State of New York. Non-residents pay a tuition fee of \$25. If a student withdraws, the Treasurer may refund a part of the tuition fee or cancel a part of the obligation that the student has incurred for tuition, provided the reason for the withdrawal be stated in writing and be satisfactory to the Comptroller and the Registrar. The amount that the student owes the University for tuition is 10 per cent of the term's tuition for each week or fraction of a week between the first registration day and the date of his certificate of withdrawal. This rate applies also to students registering for a part of the term only, as for the second period of the professional course in dairy industry.

Any tuition or other fee may be changed by the Board of Trustees to take effect at any time without previous notice.

BOARD AND LODGING

A number of fees and incidental expenses are detailed under the description of each course, but practically the only large expense is the cost of living in Ithaca and the railroad fare to and from Ithaca. While special arrangements may sometimes be made to lower costs, it is best to count on from \$6 to \$8 a week for board and from \$3 or \$4 for a room. The cost of books need not be more than \$10, but it has been the experience of winter-course students that they wish to buy a number of books to take home, and it would be well to allow at least \$15 for this item. Statements made by students in previous years show that \$175 or \$225 is a reasonable amount to allow for total expenses exclusive of clothes and travel. By careful management this may be reduced somewhat; but it is best not to stint too much, since great economy is likely to lessen the value of the course.

OTHER FEES

The laboratory fees, other expenses, and costs of observation trips, are mentioned in the descriptions of the courses in the announcement. Students are also liable for breakage due to carelessness on their part.

A *Health and Infirmary Fee* of \$3 is required. In return for this, any sick student is, on his physician's certificate, admitted to the infirmary, and is given, without further charge, a bed in a ward, board, and ordinary nursing, for a period not exceeding two weeks. Extra charges are made for private rooms, special food, and special nurses. If a sick student who has not received two-weeks service during the

course is unable to gain admittance to the infirmary, by reason of lack of accommodation, he is entitled to a refund of the fee. The infirmary has no medical staff; students employ their own physicians among practitioners in Ithaca or elsewhere.

A Willard Straight Hall Membership Fee of \$3 is required, at the beginning of the term, of every winter-course student. Its payment entitles the student to a share in the common privileges afforded by the operation of Willard Straight Hall, subject to regulations approved by the Board of Managers of the Hall.

For those enrolling in unit courses of three-weeks duration or less the fee is \$1.50.

Fee Cards. All the winter-course students must call at the office of the Secretary of the College of Agriculture on November 13, at which time the fee cards will be issued with tuition fee, infirmary fee, and laboratory fees charged. The cards must be presented at the Treasurer's office in Morrill Hall and payment made not later than 12 o'clock on Saturday, November 18.

SCHOLARSHIPS AND PRIZES

Beatty Agricultural Scholarships. By the will of the late Harrison L. Beatty of Bainbridge, New York, the income from a fund of \$5927 is devoted to three equal scholarships in the winter courses to be known as the Beatty Agricultural Scholarships. These scholarships are to be awarded to residents of Chenango County, one of whom shall be a resident of the town of Bainbridge. In making the award, equal consideration will be given to education and practical experience. Competitive examinations are held annually in Norwich and Bainbridge, New York, in the last week of September; the exact dates are to be announced to those applying for the examinations. The applications must be sent to the Secretary of the College of Agriculture, Ithaca, New York, by September 1.

CORNELL UNIVERSITY OFFICIAL PUBLICATION

This series of pamphlets is designed to give prospective students and other persons information about Cornell University. No charge is made for the pamphlet unless a price is indicated after its name in the list below. Requests for pamphlets should be addressed to the Secretary of the University at Ithaca. *Money orders should be made payable to CORNELL UNIVERSITY.*

The prospective student should have a copy of the

General Information Number

and a copy of one or more of the following Announcements:

Announcement of the Graduate School.

Announcement of the Medical College.

Announcement of the Law School.

Announcement of the College of Arts and Sciences.

Announcement of the College of Architecture.

Announcement of the College of Engineering.

Announcement of the New York State College of Agriculture.

Announcement of the Two-Year Courses in Agriculture.

Announcement of the Winter Courses in the College of Agriculture.

Announcement of the Farm Study Courses.

Program of the Annual Farm and Home Week.

Announcement of the New York State College of Home Economics.

Announcement of the Course in Hotel Administration.

Announcement of the New York State Veterinary College.

Announcement of the Graduate School of Education.

Announcement of the Summer Session.

Annual Report of the President.

Special departmental announcements, a list of prizes, etc.

Directory of the University. Price, postpaid, 25 cents.

Correspondence regarding the Cornell University Official Publication should be addressed to

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