

CORNELL UNIVERSITY OFFICIAL PUBLICATION

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New York State
College of Agriculture
for 1940-41



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The University Calendar for 1940-41

1940

FIRST TERM

Sept.	16, <i>Monday</i> ,	Entrance examinations begin.
Sept.	23, <i>Monday</i> ,	Registration and assignment, new students.
Sept.	24, <i>Tuesday</i>	Registration and assignment, old students.
Sept.	26, <i>Thursday</i>	Instruction begins at 8 A.M.
Oct.	17, <i>Thursday</i>	Last day for the payment of tuition for first term.
Nov.	6, <i>Wednesday</i> ,	Registration of winter-course students.
Nov.	20, <i>Wednesday</i> ,	Instruction suspended at 4 P.M.

(Thanksgiving Recess)

Nov.	25, <i>Monday</i>	Instruction resumed at 8 A.M.
Dec.	21, <i>Saturday</i>	Instruction suspended at 12:50 P.M. in regular and winter courses.

1941

(Christmas Recess)

Jan.	6, <i>Monday</i> ,	Instruction resumed at 8 A.M. in regular and winter courses.
Jan.	11, <i>Saturday</i>	Founder's Day.
Jan.	27, <i>Monday</i> .	Final examinations begin.
Feb.	5, <i>Wednesday</i> ,	Final examinations end.
Feb.	6, <i>Thursday</i> ,	A holiday.

SECOND TERM

Feb.	7, <i>Friday</i> ,	Instruction ends in winter courses.
Feb.	7, <i>Friday</i> ,	Registration of all students.
Feb.	10, <i>Monday</i> ,	Instruction begins at 8 A.M. in regular courses.
Feb.	10-15,	Farm and Home Week.
March	3, <i>Monday</i> ,	Last day for the payment of tuition for the second term.
March	29, <i>Saturday</i> ,	Instruction suspended at 12:50 P.M.

(Spring Recess)

April	7, <i>Monday</i> ,	Instruction resumed at 8 A.M.
May	—, <i>Saturday</i> ,	Spring Day: a holiday.
June	2, <i>Monday</i> ,	Final examinations begin.
June	10, <i>Tuesday</i> ,	Final examinations end.
June	16, <i>Monday</i> ,	COMMENCEMENT.

CORNELL UNIVERSITY OFFICIAL PUBLICATION

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NEW YORK STATE COLLEGE OF AGRICULTURE

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†On leave second term.

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 Herbert Bertsch Hartwig, Ph.D., Professor of Field Crops.
 Arthur John Heinicke, Ph.D., Professor of Pomology and Pomologist in the Experiment Station.†

†On leave second term.

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- Clive Maine McCay, Ph.D., Professor of Animal Nutrition and Animal Nutritionist in the Experiment Station.
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- Laurence Howland MacDaniels, Ph.D., Professor of Horticulture and Horticulturist in the Experiment Station.
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- Robert Matheson, Ph.D., Professor of Economic Entomology and Entomologist in the Experiment Station.
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- Walter Conrad Muenschner, Ph.D., Professor of Botany and Weed Specialist in the Experiment Station.

†On leave second term.

- Clyde Hadley Myers, Ph.D., Professor of Plant Breeding and Plant Breeder in the Experiment Station.
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- Allan Goodrich Newhall, Ph.D., Associate Professor of Plant Pathology and Associate Plant Pathologist in the Experiment Station.
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- Arthur Bernhard Recknagel, B.A., M.F., Professor of Forest Management and Utilization.
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- James Morgan Sherman, Ph.D., Professor of Dairy Industry and Bacteriologist in the Experiment Station.

†On leave second term.

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 George Samuel Butts, B.S., Assistant Professor in Extension Service and Supervisor of Farm Study Courses.
 Robert Flint Chandler, jr., Ph.D., Charles Lathrop Pack Assistant Professor of Forest Soils.

*On leave first term.

†On leave second term.

- Daniel Grover Clark, Ph.D., Assistant Professor of Botany and Assistant Botanist in the Experiment Station.
- Robert Theodore Clausen, Ph.D., Assistant Professor of Botany, Bailey Hortorium.
- Randall Knight Cole, Ph.D., Assistant Professor of Poultry Husbandry and Animal Genetics and Assistant Animal Geneticist in the Experiment Station.
- Donald Louis Collins, Ph.D., Assistant Professor of Economic Entomology and Assistant Entomologist in the Experiment Station.
- William Marshall Curtiss, Ph.D., Assistant Professor of Marketing and Investigator in Marketing in the Experiment Station.
- Arthur Watson Dimock, Ph.D., Assistant Professor of Plant Pathology and Assistant Plant Pathologist in the Experiment Station.
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- Theodore Roy Hansberry, Ph.D., Assistant Professor of Insect Toxicology and Assistant Insect Toxicologist in the Experiment Station.
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- George Abdallah Knaysi, Ph.D., Assistant Professor of Bacteriology and Assistant Bacteriologist in the Experiment Station.
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- Harlan Parker Banks, A.B., Instructor in Botany.
- Howard Francis Bardwell, Experimentalist in Animal Husbandry in the Experiment Station.
- Roy Stanley Beck, Ph.D., Extension Instructor in Marketing.
- John Nicholas Belkin, B.S., Instructor in Entomology.
- Leslie Herbert Bemont, B.S., Extension Instructor in Poultry Husbandry.

*On leave first term.

†On leave second term.

‡On leave first and second terms.

Charles Jessie Blanford, Ph.D., Extension Instructor in Marketing.
William George Bodenstein, M.S., Instructor in Entomology.
Alfred Worden Boicourt, B.S., Instructor in Floriculture.
George Elmer Brandow, Ph.D., Extension Instructor in Prices.
James David Burke, B.S., Extension Instructor in Animal Husbandry.
Ferdinand Hinckley Butt, Ph.D., Instructor in Entomology.
Robert Birney Child, B.S., Extension Instructor in Agronomy.
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William Thomas Craig, Experimentalist in Plant Breeding in the Experiment Station.
George Wesley Crowther, B.S., Extension Instructor in Agricultural Engineering.
Henry Dietrich, Ph.D., Instructor in Entomology and Curator of Insects.
Ernest Dorsey, Ph.D., Instructor in Plant Breeding and Assistant in Plant Breeding in the Experiment Station.
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Daniel Robert Embody, B.S., Instructor in Limnology.
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Curtis Gilbert Keyes, M.S., Instructor in Ornamental Horticulture.
James Stephen Knapp, B.S., Instructor in Extension Service.
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William Harwood Long, B.A., Research Instructor in Avian Physiology (Department of Poultry Husbandry).
John James McAllister, Experimentalist in Plant Breeding in the Experiment Station.
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Floyd Reece Nevin, Ph.D., Instructor in Biology.
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L. B. Norton, Associate in Research (Geneva Station).
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Vernon Sennock Lee Pate, A.B., Instructor in Entomology.
Robert Lee Patton, Ph.D., Instructor in Insect Physiology.
Carl Spencer Pearson, B.S., Assistant Soil Surveyor.
Elmer Strobel Phillips, B.S., Instructor in Extension Teaching.

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 James Dunbar Pond, M.F., Extension Instructor in Forestry.
 Alfred M. S. Pridham, Ph.D., Instructor in Floriculture.
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 Robert Sigmund Reich, B.S., Instructor in Ornamental Horticulture.
 Mrs. Ethel Cowles Roberts, M.S. in Ed., Instructor in Rural Education.
 Cecil D. Schutt, Instructor in Animal Husbandry and Assistant in Animal Husbandry in the Experiment Station.
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 Karl Leroy Smiley, B.S., Instructor in Bacteriology.
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 Thomas Sproston, jr., B.S., Instructor in Plant Pathology.
 Josephine Strode, Ph.B., M.A., Instructor in Rural Sociology.
 Robert Dean Sweet, M.S., Extension Instructor in Vegetable Crops.
 William Davenport Swope, M.S., Extension Instructor in Plant Breeding.
 George Walter Tailby, B.S.A., Extension Instructor in Animal Husbandry.
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 Henry Keith Townes, jr., Ph.D., Instructor in Entomology.
 Thomas Broadhead Tracy, M.E., Instructor in Institutional Engineering.
 Allan Hosie Treman, A.B., LL.B., Lecturer in Business Law (first term).
 Howard Strying Tyler, Ph.D., Instructor in Land Economics and Assistant Land Economist in the Experiment Station.
 Archie Van Doren, A.B., Extension Instructor in Pomology.
 Alfred Van Wagenen, Ph.D., Instructor in Marketing and Investigator in Marketing in the Experiment Station.
 Thomas Cobb Watkins, Ph.D., Research Instructor in Economic Entomology.
 Charles Leonard Weddle, jr., M.S., Instructor in Floriculture.
 Kenneth Eugene Wheeler, B.S., Instructor in Floriculture.
 Robert Henry White-Stevens, M.S., Research Instructor in Vegetable Crops and Assistant Investigator in the Experiment Station.
 Robert Haworth Williams, B.S., Instructor in Botany.

ASSISTANTS

George Woodford Abel, B.S., Assistant in Forestry.
 Mrs. Mabel White Allen, B.A., Assistant in Botany.
 Richard Thomas Allman, B.S.A., Assistant in Agronomy.
 Elias Milton Andersen, B.S., Research Assistant in Vegetable Crops.
 Roice Hyrum Anderson, B.S., Assistant in Rural Economy.
 Carl Joseph Anderwald, B.S.C.E., Assistant in Industrial Education.
 Willis Harrison Ashton, Assistant in Agricultural Engineering.
 James Davis Aughtry, jr., B.S., Assistant in Agronomy.
 Betty Jane Austin, B.S., Assistant in Extension Service.
 MacLean Jack Babcock, M.S., Assistant in Animal Nutrition and Assistant in Animal Nutrition in the Experiment Station.
 Robert Francis Ball, B.S., Assistant in Animal Genetics (Department of Poultry Husbandry).
 Clare August Becker, B.S., Assistant in Farm Management.
 Kenneth Robert Bennett, B.S., Assistant in Prices and Statistics.
 Donald Vincent Benson, B.S., Assistant in Plant Breeding.
 Leon Bernstein, B.S., Assistant in Botany.
 Ivan Rae Bierly, B.S., Extension Assistant in Farm Management.
 William Elmer Black, B.S.A., Assistant in Marketing.

H. Weston Blaser, Ph.D., Assistant in Botany.
 Frank Paul Boyle, jr., B.S., Assistant in Botany.
 Charles Arthur Bratton, B.S., Assistant in Land Economics.
 Robert Webster Bratton, M.S., Assistant in Animal Husbandry and Assistant in
 Animal Husbandry in the Experiment Station.
 John Grobe Brereton, B.S., Assistant in Bacteriology.
 Lloyd Allen Brinkerhoff, M.S., Research Assistant in Plant Pathology.
 James Stanley Brooks, A.B., Assistant in Botany.
 Max Edwin Brunk, B.S.A., Extension Assistant in Land Economics (first term).
 Stewart Henry Burnham, B.S., Assistant Curator in Botany.
 John Gilbert Cady, M.S., Assistant in Forest Soils.
 John Carlton Cain, B.S.A., Research Assistant in Pomology.
 Kenneth Van Houten Carey, B.S., Assistant in Agricultural Education.
 James Rolland Carson, B.S., Assistant in Poultry Husbandry.
 Olaf Guido Cavetz, Assistant in Agronomy.
 Elizabeth Collamore Chase, B.S., Assistant in Dairy Industry.
 Vincent Winner Cochrane, B.S., Assistant in Plant Pathology.
 Leland Gwaltney Cox, B.S., Assistant in Forestry.
 Lee Robert Crane, M.S. in Ed., Assistant in Agricultural Education.
 Richard Collier Crosby, M.S. in Ed., Assistant in Rural Education.
 Perry Thomas Cupps, B.S., Assistant in Animal Physiology and Assistant in
 Animal Physiology in the Experiment Station.
 Otis Freeman Curtis, jr., A.B., Assistant in Botany.
 John Wallace Dallenbach, B.A., Assistant in Rural Education.
 Glenn Elmore Davis, B.Ed., Assistant in Vegetable Crops.
 Phares Decker, M.S., Research Assistant in Plant Pathology.
 Avery Holmes De Golyer, B.S., Extension Assistant in Agricultural Engineering.
 Herrell Franklin DeGraff, B.S., Assistant in Farm Management.
 Erwin Rudolph Draheim, M.S., Assistant in Rural Education.
 Ernest Mapp Dunton, jr., M.S., Assistant in Agronomy.
 Sara Creecie Dyal, M.A., Assistant in Botany.
 Ralph Allen Eastwood, B.S., Assistant in Land Economics.
 Louis James Edgerton, B.S.A., Extension Assistant in Pomology.
 John Einset, B.S., Assistant in Botany.
 Irvine Elliott, B.S., Assistant in Animal Physiology in the Experiment Station.
 William Monroe Epps, B.S., Research Assistant in Plant Pathology.
 Marion Erickson, A.B., Assistant in Poultry Husbandry.
 Otto Erickson, Assistant in Entomology.
 William Howard Ewart, M.Sc., Research Assistant in Entomology.
 Donald Brice Ferguson, M.S.A., Assistant in Marketing.
 Hugh Fenner Fitzpatrick, A.B., Assistant in Plant Pathology.
 Mrs. Edith Jeffers Freeman, M.S., Assistant in Rural Sociology.
 Karl Edrick Gardner, Ph.D., Assistant in Animal Husbandry and Assistant in Ani-
 mal Husbandry in the Experiment Station.
 Joseph Woolley Geddes, jr., M.S., Extension Assistant in Rural Sociology.
 Marvin Bob Gillis, B.S., Assistant in Poultry Husbandry.
 Eva Lucretia Gordon, M.S., Assistant in Rural Education.
 Bradley Otis Gormel, M.S., Extension Assistant in Animal Husbandry.
 Leon Franklin Graves, M.A., Assistant in Meteorology.
 Garvin Green, B.S.A., Assistant in Entomology.
 Shaw Earl Grigsby, M.S., Assistant in Rural Sociology.
 Lyle Everest Hagmann, M.S., Assistant in Entomology.
 Arno John Hangas, B.S.A., Assistant in Farm Management.
 Lester Eugene Hanson, M.S.A., Assistant in Animal Husbandry and Assistant in
 Animal Husbandry in the Experiment Station.
 Lowell Stuart Hardin, B.S., Assistant in Land Economics.
 Norman H. High, B.S.A., Assistant in Rural Education.
 Charles Seright Hobbs, B.S., Assistant in Animal Husbandry and Assistant in
 Animal Husbandry in the Experiment Station.
 Raymond William Hoecker, M.S.A., Assistant in Farm Management.

Leon Frederic Hough, B.S., Assistant in Pomology.
 P'eng Ch'eng Hsu, M.S., Assistant in Animal Nutrition and Assistant in Animal Nutrition in the Experiment Station.
 Ernest Paul Imle, M.Sc., Research Assistant in Plant Pathology.
 Duane Isley, M.S., Assistant in Botany.
 Walter Casper Jacob, M.S., Research Assistant in Vegetable Crops.
 Vernon Cornielian Jamison, B.S., Assistant in Agronomy.
 Karl Hamilton Jarvis, B.S., Assistant in Plant Breeding.
 Donald Herbert Jolly, A.B., Assistant in Botany.
 Dean Graeme Jones, B.S., Assistant in Animal Genetics (Department of Poultry Husbandry).
 Francis Malloy Jornlin, B.S., Research Assistant in Agronomy and Assistant in Soil Chemistry in the Experiment Station.
 Oren Lloyd Justice, Ph.D., Assistant in Botany.
 Harold Frederick Kaufman, A.M., Assistant in Rural Sociology.
 Sidney Robinson Kennedy, jr, Ph.D., Assistant in Botany.
 Theodore William Kerr, jr., B.S., Research Assistant in Entomology.
 Herbert Richard Kling, B.S., Assistant in Marketing.
 Leighton Francis Koehler, M.S., Assistant in Agronomy.
 Thomas Eldredge LaMont, Ph.D., Extension Assistant in Land Economics (first term).
 Robert George Latimer, B.S., Assistant in Rural Economy.
 Wayne Austin Lee, M.S., Assistant in Marketing.
 Fred Herbert Lewis, B.S., Research Assistant in Plant Pathology.
 Oscar Anthony Lorenz, B.S., Research Assistant in Vegetable Crops.
 Henry Laurence Lucas, jr., B.S., Assistant in Animal Nutrition.
 Clarence W. Lyon, jr., Assistant in Aquiculture.
 Harry Alexander MacDonald, M.S., Research Assistant in Agronomy.
 Fred McGoldrick, M.S., Research Assistant in Vegetable Crops.
 John Archibald Mack, B.S., Assistant in Agricultural Education.
 Gabriel Raphael Mandels, B.S., Assistant in Botany.
 Clyde Augustus Marion, Assistant in Agronomy.
 Russell Dickinson Martin, B.S., Assistant in Extension Teaching.
 Don A. Marshall, M.S., Assistant in Land Economics.
 Gerhard C. Matzner, M.A., Assistant in Rural Education.
 Robert Lee Metcalf, A.M., Assistant in Entomology.
 John Jasper Mikell, M.S., Assistant in Vegetable Crops.
 Wilford Richard Mills, Ph.D., Assistant in Plant Pathology.
 William Montagna, B.A., Assistant in Ornithology.
 Leonard Leslie Morris, M.S., Research Assistant in Vegetable Crops.
 Clyde Dewey Mueller, B.S.A., Assistant in Poultry Husbandry.
 Clarence William Mulligan, B.S., Assistant in Agricultural Engineering.
 Merritt Joseph Murray, Ph.D., Assistant in Plant Breeding.
 Max Myers, B.S., Extension Assistant in Marketing.
 Kenneth Bonney Nash, B.S., Research Assistant in Entomology.
 Lee Blanton Nash, Ph.D., Research Assistant in Vegetable Crops.
 Harry Brooks Naylor, B.S., Assistant in Bacteriology.
 Walter Nelson, M.S., Assistant in Animal Nutrition and Assistant in Animal Nutrition in the Experiment Station.
 Vincent Fleetwood Nettles, M.S., Assistant in Vegetable Crops.
 Vessie Howard Nicholson, B.S., Assistant in Marketing.
 John Strong Niederhauser, B.S., Assistant in Plant Pathology.
 Harold Leslie Noakes, M.S. in Ed., Assistant in Agricultural Education.
 Jonathan Oscar Nottingham, M.A., Research Assistant in Entomology.
 Robert Edward Olson, B.S., Research Assistant in Entomology.
 Leon Frederick Packer, B.S., Assistant in Agricultural Education.
 Elmer Arthur Palmatier, M.S., Assistant in Botany.
 Lester Cole Peterson, B.S., Research Assistant in Plant Pathology.
 Ruth Alice Petry, A.B., Assistant in Botany.
 Hans Heinrich Plambeck, M.A., Assistant in Rural Sociology.

Earl Gerald Planty, M.A., Research Assistant in Rural Education.
Daniel Townsend Pope, M.S., Assistant in Plant Breeding.
Seth Alison Pope, A.B., Research Assistant in Plant Pathology.
Martin Potter, Assistant in Pomology.
Noel Printiss Ralston, M.S., Assistant in Animal Husbandry.
Maynard Jack Ramsey, M.A., Assistant in Biology.
Mrs. Fannie Rane Randolph, M.A., Assistant in Botany.
James David Rebstock, A.B., Research Assistant in Plant Pathology.
William Woodland Reeder, M.S., Assistant in Rural Sociology.
John William Holman Rehn, B.S., Assistant in Parasitology.
Ruby Rema Rice, M.S., Assistant in Plant Pathology.
Martin Varney Rockwell, B.S., Assistant in Rural Economy.
James Neville Roney, M.S., Research Assistant in Entomology.
William Francis Royce, B.S., Assistant in Biology.
Frank Joseph Rudert, A.B., Assistant in Dairy Industry.
Albert Horton Sayer, B.S., Assistant in Agricultural Engineering.
Arnold Edward Schumacher, M.S., Assistant in Poultry Nutrition.
William Arvid Seleen, B.S., Assistant in Bacteriology.
Joseph Bjorn Skaptason, M.Sc., Research Assistant in Plant Pathology.
Walter Skott, Assistant in Entomology and Plant Pathology.
Paul Albert Smith, B.S., Assistant in Dairy Industry.
Obel Lavelle Snowden, M.S., Assistant in Agricultural Education.
Franklin Wallburg Southwick, M.S., Assistant in Pomology.
Felix Edward Stanley, B.S., Assistant in Marketing.
Aubrey Porter Stewart, B.A., Assistant in Dairy Industry.
Ke Sung, M.S. in Ed., Assistant in Rural Education.
Clayton Isaac Swayze, A.B., Assistant in Botany.
Stefan Taussig, Extension Assistant in Animal Husbandry.
Louis Tepper, Assistant in Plant Pathology.
Paul Sink Thompson, B.S., Assistant in Business Management.
Harold Trapido, M.A., Assistant in Zoology.
Charles Sterling Tuthill, B.S., Research Assistant in Plant Pathology.
Lowell Dohner Uhler, B.S. in Ed., Assistant in Entomology.
Donald Leroy Van Horn, M.S.A., Assistant in Agronomy.
Deboise Arthur Van Slyke, B.A., Assistant in Rural Government.
Clifford Charles Volkerding, B.S., Assistant in Agronomy.
George Frederick Warren, Jr., B.S., Research Assistant in Vegetable Crops.
Ross Derrick Watson, M.S., Assistant in Plant Pathology.
Dwight Albert Webster, B.S., Assistant in Fisheries.
James Carrick White, B.S., Assistant in Dairy Industry.
Alvin Richard Whitehill, A.B., Assistant in Bacteriology.
James Eugene White, B.A., Assistant in Rural Sociology.
Elwin Linton Willett, M.S., Assistant in Animal Husbandry and Assistant in
Animal Husbandry in the Experiment Station.
Charles Edward Williamson, A.B., Research Assistant in Plant Pathology.
Warren Charles Wilson, B.S., Assistant in Floriculture.
George Wallis Woodbury, M.S., Assistant in Vegetable Crops.
Martin Dwight Woodin, M.S., Assistant in Marketing.
William Dickey Wylie, B.S.A., Research Assistant in Entomology.
Stuart G. Younkin, B.S., Research Assistant in Plant Pathology.

ADMISSION AND GRADUATION

THE COURSES AVAILABLE

The resident instruction in the College of Agriculture is planned for those who desire training in agriculture and in the sciences most closely related to agriculture. From 70 to 80 per cent of the men graduates of the College go into agricultural pursuits. Besides farming, which is the most common occupation followed, there is a great range of related professional or technical vocations, for which the course in this College offers training. Manufacturing dairy products, teaching agriculture, agricultural extension, work in agricultural experiment stations, and administrative work in farmers' organizations dealing in agricultural products and machinery, may be cited as examples of these vocations.

The instruction is organized, for the most part, in a course of four years, or eight terms, leading to the degree of bachelor of science.

For those who cannot plan to take four years of college work, special curricula are organized, running through two years and giving specific training for definite vocational objectives.

Aside from the above, there are a twelve-weeks winter course not giving credit toward a degree and a six-weeks summer school designed especially for teachers, school principals, and superintendents. There are also one-week and two-weeks courses with very specific purposes. Correspondence courses, without credit toward a degree, are available.

The information contained in this announcement applies specifically to the four-year course. Circulars describing the other courses referred to may be obtained on application to the Secretary of the College.

DIRECTIONS REGARDING CORRESPONDENCE

For admission to the freshman class, to the two-year courses, and to advanced standing from other colleges and universities, all communications should be addressed to the Director of Admissions of the University.

For enrollment in correspondence courses, communications may be addressed to the Supervisor of Study Courses in the College of Agriculture.

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

A circular, referred to as the *General Information Number*, giving details concerning admission, expenses, scholarships, and related subjects, may be obtained on application to the Secretary of the University.

THE APPLICATION FOR ADMISSION

Admission to the College is not simply a matter of presenting certain specified entrance units. For both the applicant and the

College it is of the utmost concern that a proper choice of college work be made, and the College, therefore, in making its choice of students to be admitted, considers not only the school record submitted but also any other available indications of probable success in the course the student proposes to take. For this reason the applicant should give, in addition to his formal school credentials, the fullest information regarding his background and experience, the quality of his work, his resources for carrying on, and his own purposes in seeking a college education, so that the College may have a better basis for consultation and decision. Correspondence regarding these matters is solicited and, if it is at all possible, applicants should come to the College for an interview.

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 College. This experience is necessary in order to meet the farm-practice requirement (pages 19 and 50).

Every candidate for admission to an undergraduate course must deposit \$25 with the University. Candidates are warned not to send cash through the mails. A check, draft, or money order should be made payable to Cornell University and should be sent to the Office of Admissions, Cornell University. The deposit must be made not later than August 1 if the candidate is to be admitted in September and not later than January 1 if, by exception, he is to be admitted in February.

If the candidate matriculates, the deposit will be credited to his account, \$10 for the matriculation fee, \$1 for an examination-book fee, and \$14 as a guaranty fund, which every undergraduate student is required to maintain and which is to be refunded upon his graduation or permanent withdrawal, less any indebtedness to the University.

If admission is denied a candidate, the deposit is refunded in full at any time.

A candidate may withdraw the application for admission, but a charge of \$10 is regularly made for accrued expenses unless the application is withdrawn and a refund of the deposit in full is claimed before August 1. If an application is not withdrawn until after August 1, but is withdrawn before August 31, the \$10 charged for accrued expenses is deducted and \$15 of the deposit is refunded. No refund is made to an applicant who withdraws the application after August 31.

In the case of applications for admission in February, a withdrawal after January 1 incurs the regular charge of \$10, and no refund is made for withdrawal after January 31.

Every candidate for matriculation must submit to the Director of Admissions a satisfactory certificate of vaccination against small-pox, not later than August 1 if he is to be admitted in September, or not later than January 1 if he is to be admitted in February. It will be accepted as satisfactory only if it certifies that within the last five years a successful vaccination has been performed or three unsuccessful attempts at vaccination have been made.

Candidates for admission to the four-year course must be at least sixteen years of age. They must have certificates of good moral char-

acter; and students from other colleges or universities are required to furnish certificates of honorable dismissal from those institutions. The academic requirements may be satisfied by the presentation of New York State Regents credentials, or acceptable school certificates, or by passing the June or September examinations of the College Entrance Examination Board.

Candidates for admission must file their credentials and obtain permits for any necessary entrance examinations at the office of the Director of Admissions, Morrill Hall. The results of entrance examinations may be ascertained from the Office of Admissions.

ENTRANCE REQUIREMENTS FOR THE FOUR-YEAR COURSE

The subjects that may be offered for admission to the College of Agriculture are named in the following list; the figure in parenthesis following each subject indicates its value in entrance 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.

- | | |
|--|---|
| 1. English, 4 years.....(3) | 9f. Plane Trigonometry.....($\frac{1}{2}$) |
| 2. 1st to 3rd Year Greek.....(1, 2, 3) | 10. Physics.....(1) |
| 3. 1st to 4th Year Latin...(1, 2, 3, 4) | 11. Chemistry.....(1) |
| 4. 1st to 4th Year German (1, 2, 3, 4) | 12. Physical Geography.....($\frac{1}{2}$ -1) |
| 5. 1st to 4th Year French (1, 2, 3, 4) | 13. Biology*.....(1) |
| 6. 1st to 4th Year Spanish (1, 2, 3, 4) | 13a. General Science.....(1) |
| 7. 1st to 3d Year Italian.....(1, 2, 3) | 14. Botany*.....($\frac{1}{2}$ -1) |
| 8a. Ancient History.....($\frac{1}{2}$ -1) | 14a. Zoology*.....($\frac{1}{2}$ -1) |
| 8b. European History.....($\frac{1}{2}$ -1) | 15. Bookkeeping†.....($\frac{1}{2}$ -1) |
| 8c. English History.....($\frac{1}{2}$ -1) | 16. Agriculture, Home Econ.†.....($\frac{1}{2}$ -4) |
| 8d. Am. History and Civics.....($\frac{1}{2}$ -1) | 17. Drawing.....($\frac{1}{2}$ -1) |
| 9a. Elementary Algebra.....(1) | 18. Manual Training.....($\frac{1}{2}$ -1) |
| 9b. Intermediate Algebra.....(1) | 19. $\left\{ \begin{array}{l} \text{Any high-school subject} \\ \text{or subjects not already} \\ \text{used and acceptable to} \\ \text{the University.} \end{array} \right\}$ ($\frac{1}{2}$ -2) |
| 9c. Advanced Algebra.....($\frac{1}{2}$) | |
| 9d. Plane Geometry.....(1) | |
| 9e. Solid Geometry.....($\frac{1}{2}$) | |

*If an applicant has counted Biology (1), he may not also offer 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. Bookkeeping may not be offered together with more than one of the subjects listed under 16, 17, and 18.

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

A. Fifteen units, arranged as follows: English (3), history (1), elementary algebra (1), plane geometry (1), foreign language (3 units in one language or 2 units in each of two), elective (6 or 5).

B. The New York State Academic Diploma in Agriculture, with the proviso that elementary algebra, 1 unit, and plane geometry, 1 unit, are included.

ADMISSION WITH ADVANCED STANDING

A student admitted to the College of Agriculture from another college in Cornell University, or from any other institution of colle-

giate 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 his last two terms and have completed no less than fifteen hours a term, of which two-thirds, at least, must be subjects taught by the staff of the College of Agriculture.

Credit toward a degree for work done in a preparatory school on subjects that may be offered for entrance to the University will be given to those students only who, in addition to satisfying all entrance requirements, pass separate examinations in the subjects for which they seek college credit. These examinations will cover substantially the same ground as the university courses in the subjects. An applicant desiring a college-credit examination of this kind must apply to the Office of Admissions as early as possible, and in no case later than September 15, specifying which fifteen units he intends to offer in satisfaction of the entrance requirements, and on what other entrance subjects he wishes to be examined for credit. In case he fails to satisfy the entrance requirements in any one or more of the units on which he proposes to enter, but passes the credit examination in any other subject or subjects, he may use the latter toward satisfying entrance requirements, but in that case he cannot also receive college credit for it.

A student who receives at entrance twelve or more hours of credit in addition to the requirements for admission may be regarded as having satisfied one term of residence. Under no circumstances is surplus entrance credit based on extra work done in a preparatory school accepted as the equivalent of more than one term.

A student who has satisfied the entrance requirements of this College, and has afterwards completed in two or more summer sessions in Cornell University at least twelve hours of work in courses approved by the departments concerned, may be regarded as having thus satisfied one term of residence. Work done in summer sessions is not accepted as the equivalent of more than two terms of residence. The maximum amount of credit toward the degree of bachelor of science which is allowed for the work of any one summer session is eight hours.

REQUIREMENTS FOR ADMISSION OF SPECIAL STUDENTS

Opportunity is provided for the admission of students whose needs may not be well met by the organized curricula of the College. Applicants for admission to such special standing must present entrance credentials as other students do and in addition they must present a detailed statement of the program they desire to follow. They

must show that they have had recent farm experience or other experience qualifying them for the special work they plan to do and, unless they offer regular entrance, they must be twenty-one years of age.

Students having a first degree and desiring further undergraduate work may be admitted as special students. The work of such students will ordinarily be limited to courses in the College of Agriculture; for work taken outside tuition will be charged at the rate prevailing in the college where the work is done.

REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE

The requirements for the degree of bachelor of science are residence for eight terms, and, in addition to the prescribed work in the Departments of Physical Training and Military Science and Tactics, the completion of one hundred and twenty-two hours of required and elective work, as outlined on pages 19 and 20.

All men students must satisfy the farm-practice requirement before the beginning of the senior year. This requirement is the equivalent of a year or more of farm work. In order to meet it, students should have a good working knowledge of farm animals, crops, and machinery, and of the ordinary farm operations as they are practiced on a general farm. Students should complete the requirement as early in their course as possible, since it is prerequisite for admission to certain courses. Students specializing in botany, bacteriology, or entomology are allowed to substitute special work in those fields for part or all of the farm-practice requirement. The intention to qualify as a specializing student in one of these subjects should be discussed with the department as early as possible, preferably at the end of the first year, so that there may be opportunity for beginning the practice immediately.

Freshmen are required to attend, during their first term, a course designed to orient students in the life of the University and specifically to acquaint them with the scope and purpose of the courses of instruction in the College. The course requires attendance two hours a week and carries one hour of credit.

THE COURSES LEADING TO THE DEGREE OF BACHELOR OF SCIENCE

(Those required courses which are given in other colleges than Agriculture are described on pages 70 to 73.)

Freshman Orientation Course.....	1
Hygiene 1 and 2.....	2
English 2.....	6
Botany, Biology, or Zoology.....	6
Chemistry 102 or 104, or Physics 3 and 4.....	6

Geology 100 (the requirement may be waived for students presenting geology or physical geography for entrance. In such a case 3 hours is added to the minimum of agricultural electives)	3
Basic sciences and social studies.....	24
(Not less than 9 hours and not less than 2 subjects under A and not less than 9 hours and 2 groups of subjects under B)	
A. Biology, botany, zoology, bacteriology, physiology, genetics, psychology, chemistry, physics, geology, physical geography, mathematics, meteorology, human growth and development.	
B. Economics 1, 2a, 2b.	
Government 1, 1a, 2, 9; Agricultural Economics 135, 138.	
History 42, 50, 61, 82, 83, 86, 87.	
Social Science A, B; Sociology and Anthropology 2;	
Rural Sociology, 1, 12.	
Elective in the College of Agriculture (including any courses listed in this announcement on pages 25 to 70).....	54
Elective (either in Agriculture or in any other college in the University)	20
Total.....	122

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

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

REGISTRATION FOR COURSES

The schedule for the freshman year must include:

Freshman Orientation Course.....	1
Hygiene 1 and 2.....	2
English 2.....	6
Botany 1, Biology 1, or Zoology 1.....	6
Chemistry 102 or 104, Physics 3 and 4.....	6
Elective courses in the College of Agriculture.....	6
Elective in the basic sciences, social studies, or in courses in the College of Agriculture.....	3-6

In selecting his course, the student must obtain the approval of a faculty adviser, preferably in the department in which he expects to specialize, who shall be chosen by the student before the beginning of the sophomore year.

A student must register for at least twelve hours each term, and no new student may register for more than eighteen hours.

Necessary changes of registration must be made within the first ten days of the term.

Failures in courses, either required or elective, taken outside of the College of Agriculture are counted against the allotment of 20 free hours.

If the students who have met all requirements desire to take courses outside of the College of Agriculture in addition to those required or allowed free, they may do so upon paying for the additional hours at the rate of tuition prevailing in the colleges where the courses are taken.

To be eligible for the degree, the student must maintain an average grade of at least 70 for the entire course.

PAYMENTS TO THE UNIVERSITY

TUITION

Tuition is free to undergraduate students pursuing full, special, or short courses in the New York State College of Agriculture, who at the time of their admission are, and for at least twelve months prior thereto have been, bona-fide residents of the State of New York.

Since physical presence in the State, especially in the case of those under age, by no means constitutes legal residence, applicants who are at all doubtful of their own right to exemption should address inquiries in advance to the Director of Resident Instruction in the College of Agriculture.

No student is allowed to transfer from any free-tuition course to another course wherein tuition is charged without first paying the difference in tuition for the credit transferred.

Students in Agriculture who are not exempt under these provisions are required to pay \$200 tuition for the regular year. Tuition-paying students transferring from the College of Agriculture to other colleges in the University must first make payment of the difference in tuition for the credit transferred. All students registered in the Summer Session, whether or not exempt in the other terms, pay a tuition fee of \$55.

The tuition fee of \$200 is payable in installments of \$110 at the beginning of the first term and \$90 at the beginning of the second term, but a student registered only for the second term of the academic year is required to pay at the rate of the first term.

Students desiring to take, while registered in the College of Agriculture, courses in other colleges in the University, beyond those specifically required and also beyond the twenty hours allowed free, may do so upon payment of tuition for the additional hours at the rate of tuition in the college in which the work is taken.

Tuition and other fees become due when the student registers. The University allows twenty days of grace after the last registration day of each term of the regular session. The last day of grace is generally printed on the registration coupon which the student is required to present at the Treasurer's office.

Any student, graduate or undergraduate, except as hereinafter provided, who fails to pay his tuition fees, and other indebtedness within the time prescribed by the University is thereby dropped from the University. When in his judgment the circumstances in a particular case so warrant, the Treasurer may allow an extension of time to complete payments. For such extension, the student will be assessed a fee of \$2. A financial reinstatement fee of \$5 will be assessed in the case of any student who is permitted to continue or return to classes after being dropped from the University for default in payments. For reasons satisfactory to the Comptroller and the Registrar, which must be presented in writing, the above assessment may be waived in any individual case.

The rules governing the rate of tuition in cases of withdrawal during the term or of registration late in the term are stated in the *General Information Number*.

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

OTHER FEES

A *matriculation fee* of \$10 is required of every student upon entrance into the University. This fee must be paid at the time of registration. A new student who has made the required deposit of \$25 with the Treasurer does not make an additional payment of the matriculation fee, because the Treasurer draws on the deposit for this fee. See page 16.

A *University administration fee* of \$5 is required of every student in the State colleges at the beginning of each term.

A *health and infirmary fee* of \$7.50 a term is required of every student at the beginning of each term. For a statement of the privileges given in return for this fee, see the *General Information Number*.

A *Willard Straight Hall membership fee* of \$5 a term is required of every undergraduate student at the beginning of each term. 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.

A *physical recreation fee* of \$4 is required, at the beginning of each term, of every undergraduate. Its payment entitles a man student to the use of the gymnasium and the university playgrounds, and to the use of a locker, bathing facilities, and towels, in the gymnasium, Barton Hall, or the Schoellkopf Memorial Building; and a woman student to the use of the women's gymnasium, recreation rooms, and playgrounds, and to the use of a locker.

An *examination book fee* of \$1 is required of every student at entrance to pay for the examination books furnished to the student throughout his course. The charge is made against the student's deposit fee.

A *graduation fee* is required, at least ten days before the degree is to be conferred, of every candidate for a degree. For a first, or baccalaureate, degree, the fee is \$10; for an advanced degree it is \$20.

Laboratory fees to cover the cost of materials used by the student are charged in courses that require work in laboratory, shop, or drafting room, or field work.

An average allowance of \$30 a year will probably cover laboratory fees for most students, though for the first year a larger sum is likely to be required.

Deposits are made in advance at the Treasurer's office in some courses, particularly in Chemistry. Charges for materials used and

laboratory expense are entered against the deposits, and at the end of the term any balance remaining is returned to the student.

RULES GOVERNING MINOR DELINQUENCIES

Every student is held personally responsible for any injury done by him to any of the University's property.

Assessments, charged to the student's account and payable at the Treasurer's office, are levied upon the student in certain circumstances, under the following rules of the University.

A matriculated student desiring to register after the close of registration day must first pay a fee of \$5.

A student desiring to file his registration of studies after the date set by his College for filing the same must first pay a fee of \$2.

A student desiring to take an examination or other test for the completion of a course in which the grade "absent" or "incomplete" was reported must first pay a fee of \$2 for each examination or other test.

A student desiring to make an appointment for the required medical examination or conference after twenty days from the last registration day of the term must pay a fee of \$2.

For reasons satisfactory to the proper authority, any of the above-mentioned assessments may be waived in any individual case if the student's failure to comply with the regulation was due to ill health or to any other reason beyond his control. Application for such a waiver should be made to the Secretary of the College, or, in the case of the medical examination, to the Director of the Student Health Service.

BOARD AND LODGING

Halls and lodging for men. The University has twelve residential halls and houses for men, offering accommodations for about 725 students. On July 1 available rooms are assigned by lot to new students applying for them. For particulars, address the Manager of Residential Halls, Morrill Hall, Ithaca, New York.

Many private lodging houses near the University offer furnished rooms, with heat and light, at rates ranging from \$3 to \$5 a week for a single room. Before he rents a room in a private house, a student should make sure, by a personal inspection, that the sanitary arrangements of the house are good, and he should especially insist on a good fire escape. The University publishes a list of lodging houses which have been inspected and found to be satisfactory in the above respects; the list is ready for distribution on August 1. New students, if they have not already engaged rooms, are advised to come to Ithaca and do so a few days before the day of registration. The Freshman Advisory Committee offers its help to new students, and sends them a circular letter of suggestions about September 1.

Students rooming in university dormitories as well as those lodged in private houses will enter into written contracts. The details of these agreements should be clearly understood at the outset.

The number of private houses that offer both rooms and board is small, and most students get their meals outside the houses where they live. The University conducts a cafeteria in Willard Straight Hall, as does also the College of Home Economics in Martha Van Rensselaer Hall. There are other good cafeterias which are patronized mainly by students.

Board and lodging may be obtained in Ithaca for \$11 a week, but this amount would best be regarded as the lowest practicable allowance.

Halls for women. All women students are required to live in the residential halls, Sage College and Prudence Risley Hall, or in cottages, reserved for freshmen and juniors, and in four units of Balch Hall, reserved for sophomores and seniors. In these buildings the total cost of board, laundry, and rent of furnished room with heat and light, is \$525. Exceptional circumstances which seem to make living outside of these buildings necessary should be taken up with the Dean of Women. Rooms are assigned on August 25 in the order of application. Inquiries about board and rooms in the women's halls should be addressed to the Manager of Residential Halls, Morrill Hall, Ithaca, New York.

DEPARTMENTS OF INSTRUCTION

WITH OUTLINES OF COURSES THAT MAY BE CHOSEN BY REGULAR
OR SPECIAL STUDENTS AS AGRICULTURAL ELECTIVES

SPECIAL NOTICES

The first term begins with the opening of the college year, in September. The second term begins in February. (See calendar, page 2).

Unless otherwise noted, all courses are given in the buildings of the College of Agriculture. Courses inclosed in brackets will not be given in 1940-41.

Courses numbered from 1 to 100 are open to undergraduates generally; courses numbered from 101 to 200 are intended primarily for upperclassmen and graduates; courses numbered from 200 to 300 are intended primarily for graduates.

The main divisions of subject matter under which the courses are arranged are, for the most part, separate administrative units. The exceptions are bacteriology, which is administratively joined with dairy industry; meteorology, which goes with pomology; drawing, part of which goes with floriculture and ornamental horticulture and part with agricultural engineering; and the courses in wild-life conservation and game farming, which are given cooperatively.

ORIENTATION

Orientation. First term. Credit one hour. Required of all freshmen in Agriculture. T Th 10. Roberts 131.

A course designed to orient students in the life of the University.

AGRICULTURAL ECONOMICS

FARM MANAGEMENT

102. Farm Management. Second term. Credit five hours. Open to juniors and seniors who have satisfied the farm-practice requirement. It is desirable that this course should be preceded by as many as possible of the courses dealing with the production of crops and of animals. Lectures, M W F 10. Warren 25. Laboratory: undergraduate students, T W Th or F 1.40-3.40; graduate students, F 4-6. Warren 101. On days when farms are visited, laboratory periods for both undergraduates and graduates are from 1.40-6. Associate Professor WARREN, and other members of the departmental staff.

Farming as a business; types of farming; size of business; rates of production; labor efficiency; combination of enterprises; farm layout; building arrangement; machinery; forms of tenure and leases; choosing and buying a farm; use of capital and credit; planning the organization and management of specific farms. One all-day trip and four half-day trips are taken during April and May to visit farms in near-by regions. These trips are taken on the day of the regular laboratory period. Fee for materials furnished and for transportation on trips, \$6.

103. Farm Records and Accounts. First term. Credit three hours. Lectures, T Th 8. Warren 25. Laboratory, undergraduate students, M T or W 1.40-4; graduate students, W 1.40-4. Warren 101, 140, and 240. Assistant Professor WILLIAMSON.

Planning an accounting system designed to meet the needs of the individual farm and farmer; practice in keeping the records; training in the interpretation and analysis of farm records. Fee for materials furnished, \$3.

203. Business Organization and Management of Successful New York Farms. First term. Credit four hours. Prerequisite, course 102 or its equivalent. F 1.40-4, S 8-10. Warren 101. Professor SCOVILLE.

During October and November all-day trips are taken usually on Saturdays. Two two-day trips are taken, leaving Friday morning and returning Saturday night. Approximate expenses of trips, \$20. Fee for materials furnished, \$2.

[207. **Research Methods in Farm Management.** First term. Credit one hour. Professor ————]. Not given in 1940-41.

Attention is given to the more important methods of determining the principles of farm management and the preparation of results for publication.

[208. **Research Methods in Farm Management.** Second term. Credit two hours. Th 1.40-3.40. Warren 140. Professor MISNER.] Not given in 1940-41.

The course gives experience in the tabulation and the study of farm-management data and in the preparation of the results for publication. During the spring vacation, several days are spent in taking farm-management survey records.

209. **Comparative Agriculture.** First term. Credit one hour. For graduate students. Lecture, T 9. Warren 125. Professor MISNER.

A study of the agriculture of foreign countries, with emphasis on the farm-management aspects. Fee for materials furnished, \$1.

PRICES AND STATISTICS

Attention is directed to Mathematics 10 (Mathematics for students of economics and statistics), to Mathematics 83a (Probability and Statistics), and to Mathematics 83b (Advanced Mathematical Statistics), in the College of Arts and Sciences.

111. **Statistics.** First term. Credit three hours. Lecture, M 9. Warren 125. Laboratory, M 1.40-4. Warren 25. Professor PEARSON and Mr. ————.

A study of the principles involved in the collection, tabulation, and interpretation of agricultural and marketing statistics. Analysis of statistical problems with an 80-column tabulating machine. Fee for materials furnished, \$3.

112. **Statistics.** Second term. Credit three hours. Prerequisite, course 111. Lecture, M 8. Laboratory, M 1.40-4. Warren 125. Professor PEARSON and Mr. ————.

A continuation of course 111. A study of the application of probable error; sampling; gross, partial, and multiple correlation; curve fitting to problems in this field. Methods of using 80-column tabulating equipment for multiple-correlation analysis. Fee for materials furnished, \$3.

115. **Prices.** Second term. Credit three hours. Open to juniors, seniors, and graduate students. Lectures, T Th 9. Laboratory, W 1.40-4. Warren 25. Professor PEARSON and Mr. ————.

A study of prices of farm products in relation to agricultural and industrial conditions. Fee for materials furnished, \$3.

BUSINESS MANAGEMENT

Attention is directed to Administrative Engineering 3A23 (Business and Industrial Management), Geology 206 (Commercial Geography), and to the courses in Economics, in the College of Engineering, and in the College of Arts and Sciences.

120. **Personal Financial Management.** First term. Credit three hours. Lectures, T Th 11. Warren 225. Discussion and quiz, S 9-10.20 or 10.30-11.50. Warren 201. Professor POWELL.

Planning an individual's financial program; sources and terms of credit; savings and investments; insurance of property and income; acquisition and disposition of property; provision for dependents. Fee for materials furnished, \$2.

121. **Financial Statements.** First term. Credit three hours. Lectures, T Th 9. Warren 225. Discussion and quiz, W 2-4. Warren 201. Professor POWELL.

Interpretation of the statements used to express financial condition and the results of business operations. Content of and relationship between balance sheet, operating statement, and statement of surplus; methods of valuing assets; analysis by means of ratios. Fee for materials furnished, \$2.

122. **Accounting Method.** Second term. Credit three hours. Class will meet during Farm and Home Week for those only who have not had course 121. Lec-

tures, W F 11. Warren 225. Practice period, F 1.40-4. Warren 201. Professor POWELL.

The methods and procedures used in recording business transactions and deriving financial statements; analyses of costs and budgets. Fee for materials furnished, \$1.

126. **Farmers' Cooperatives.** Second term. Credit three hours. Lectures, W F 8. Warren 225. Discussion and quiz, undergraduates, S 9-10.50; graduates, Th 2-4. Warren 201. Professor POWELL.

What cooperatives have tried to do and what they have done; their special problems of organization, finance, and control. Fee for materials furnished, \$2.

127. **Business Law.** First term. Credit two hours. Open to juniors, seniors, and graduate students. Lectures, T Th 12. Warren 25. Mr. ALLAN H. TREMAN.

Consideration is given chiefly to legal problems of particular interest to persons who expect to engage in business, including contracts, liens, mortgages, and negotiable instruments; ownership and leasing of property; wills; estates; inheritance taxation; and other practical problems.

PUBLIC ADMINISTRATION AND FINANCE

Attention is directed to the courses in Government in the College of Arts and Sciences.

135. **Local Government.** First term. Credit three hours. Lectures, W F 8. Warren 125. Laboratory, Th 1.40-4. Warren 101. Professor CATHERWOOD.

Historical development, organization, and operation of local government. Particular attention is given to receipts, expenditures, and administration of counties, towns, and school districts in New York. Fee for materials furnished, \$2.

138. **Taxation.** Second term. Credit three hours. Open to juniors, seniors, and graduate students. Lectures, M W F 11. Warren 25. Professor KENDRICK.

A study of the principles and practices of public finance, with emphasis on taxation. Among the topics examined are: the growth of public expenditures; the changing pattern of federal, state, and local taxation; general-property, personal-income, inheritance, business, commodity, and motor-vehicle taxation; the incidence of taxation; relations among taxing units; and the problem of developing a system of taxation. Fee for materials furnished, \$2.

235. **Problems in Financial Administration.** First term. Credit three hours. Alternates with course 236. Primarily for graduate students. Time and room to be arranged. Professor CATHERWOOD.

Attention is given to a number of problems in governmental financial administration, with special reference to New York, including accounting systems, budgetary procedure, borrowing procedure, and debt and tax limits. Fee for materials furnished, \$2.

[236. **Problems in Public Administration.** First term. Credit three hours. Alternates with course 235. Primarily for graduate students. Time and room to be arranged. Professor CATHERWOOD.] Not given in 1940-41.

Attention is given to a number of problems in public administration, with special reference to New York, including state and local planning, personnel administration, and administrative organization. Fee for materials furnished, \$2.

238. **Seminar in Public Finance.** Second term. Credit two hours. Primarily for graduate students. Hour and place of meeting to be arranged. Professor KENDRICK.

MARKETING

141. **Marketing.** First term. Credit three hours. Lectures, W F 10. Laboratory and discussion for undergraduates, F 1.40-4, Warren 225; for graduate students, F 11-1, Warren 240. Professor HARPER.

A general course dealing with problems of distribution of farm products. Characteristics of consumer-demand; factors to be considered in judging the best marketing plan from the standpoint of when, where, in what form, and through what channels to sell; public regulation and controls. Fee for materials furnished, \$2.

142. Marketing Fruits and Vegetables. First term. Credit four hours. Lectures, M W F 9. Warren 25. Laboratory, Th or F 1.40-4 primarily for undergraduate students. F 4-6 primarily for graduate students. Warren 240. Professor RASMUSSEN.

A study of the economic factors involved in the marketing of fruits and vegetables. Regional and seasonal competition; areas of distribution; methods of handling; costs of marketing; types of marketing organizations; sales methods; transportation and carrier services; produce law and methods of credit rating; terminal problems. Fee for materials furnished, \$3.

242. Methods and Results of Research in Marketing. First term. Credit two hours. W 4-6. Warren 225. Professor RASMUSSEN.

A critical study of research projects in marketing fruits and vegetables, and practice in planning such research.

143. Marketing Dairy Products. Second term. Credit three hours. Lectures, M W 9. Warren 25. Discussion period, undergraduate students, F 8-10 or F 1.40-3.40; graduate students, Th 4-6. Warren 240. Professor SPENCER.

A study of the marketing of fluid milk and other dairy products: economic geography of the industry; demand; supply; surplus; price plans and policies; costs of distribution; cooperative marketing; trade organization; public regulation. One all-day trip to visit milk plants is taken some time in May. Fee for materials furnished and for transportation on trips, \$4.

243. Methods and Results of Research in Marketing. Second term. Credit two hours. W 4-6. Warren 240. Professor SPENCER.

A critical study of research projects in marketing dairy products and practice in planning such research.

144. Marketing Poultry Products. Second term. Credit three hours. Preferably to be preceded by Poultry Husbandry 50. Lectures, T Th 10. Warren 225. Laboratory, T 1.40-4. Warren 240. Doctor VAN WAGENEN.

A study of the economic factors involved in the marketing of eggs and poultry, including: areas of production; distribution channels; sales methods; market costs; cold-storage operations; legislation; demand; terminal-market and consumption problems. Fee for materials furnished, \$2.

147. Marketing Trip to New York City. Second term. Credit one hour. Given only if twenty or more students register. Enrollment limited to 40. Doctor VAN WAGENEN in charge. Representatives of other departments cooperate in the course.

Five days of the spring vacation will be spent in New York City inspecting and studying the marketing of dairy products, eggs, poultry, fruits, vegetables, live-stock, and meat. A short series of introductory lectures precede the trip, at hours to be arranged. Fee for materials furnished, \$2.

A \$4 deposit for bus hire and incidental expenses is payable 10 days before the trip, at Warren Hall, Room 205. Total cost of trip need not exceed \$28 in addition to transportation to and from New York City.

RURAL ECONOMY

[151. **Public Problems of Agriculture.** Second term. Credit two hours. Open to juniors, seniors, and graduate students. Professor ————.] Not given in 1940-41.

A discussion of some of the more important problems of agriculture that involve collective or governmental action. Fee for materials furnished, \$1.

152. Current Problems of Agriculture. Second term. Credit one hour. Limited to fifty upperclassmen who have completed their farm practice. Th 11. Warren 140. Dean LADD.

262. Rural Economy, Elementary Course. First term. Credit three hours. Prerequisite, an introductory course in economics. Lectures, M W F 9, and individual conferences. Warren 325. Professor LAUMAN.

A study of the factors underlying the present conditions in rural communities

at home and abroad, and of the forces at work in shaping the agriculture of the world, chiefly along economic lines.

263. Rural Economy, Advanced Course. Second term. Credit three or four hours. Prerequisite, course 262 or special permission. Lectures, M W F 9. Warren 325. Professor LAUMAN.

A more extended study, primarily theoretical, of the general economic problems of agriculture.

264. Planning for Agriculture. Second term. Credit three hours. Prerequisite, at least junior standing, and an elementary knowledge of agriculture. Lectures, T Th 9. Warren 325. Professor LAUMAN.

A study of agricultural policies and plans for the rehabilitation and redirection of agriculture in various countries of the world.

269. Rural Economy Seminar. First and second terms. Primarily for graduate students, and for seniors (with credit) by invitation. T 2.30. Warren 316. Professor LAUMAN.

HISTORY OF AGRICULTURE

171. History of Agriculture. First term. Credit three hours. Prerequisite, junior standing and an elementary knowledge of agriculture, or special permission of the instructor. Lectures, M W F 11. Warren 325. Professor LAUMAN.

The important phases of the development of agriculture are considered historically. Stress is laid on the development of the agricultural classes, on rational agriculture, and on modern agrarian problems.

172. History of Agriculture in the United States. Second term. Credit three hours. Prerequisite, junior standing. Lectures, M W F 11. Warren 325. Professor LAUMAN.

This course deals with the land, its settlement, and its settlers in their economic, social, and political aspects; the technical development of agriculture; the beginnings of permanent agriculture; the rise of marketing problems and of the agrarian movements.

278. Research in Rural Economy or History of Agriculture. First and second terms. Credit two or three hours a term. For seniors, by permission, and for graduate students. Warren 316. Professor LAUMAN.

279. Agricultural History Seminar. First and second terms. Primarily for graduate students and for seniors (with credit) by invitation. Th 2.30. Warren 316. Professor LAUMAN.

LAND ECONOMICS AND FARM FINANCE

281. Land Economics. Second term. Credit three hours. Open to graduate students, and advanced undergraduates. Lectures, T Th 8. Warren 125. Quiz or laboratory, T 1.40-4. Warren 140. Professor HILL.

The characteristics of land and their relation to population and to public policies; the theory, methods, results, and use of land-classification studies. Fee for materials furnished, \$2.

284. Farm Finance. First term. Credit three hours. Open to advanced undergraduate students and graduate students. Lecture, Th 10. Lecture and discussion, Th 1.40-4. Warren 125. Professor W. I. MYERS.

A study of the credit institutions which serve agriculture. Fee for materials furnished, \$1.

287. The Appraisal of Farm Land. First term. Credit two hours. Primarily for graduate students. Open to seniors who have passed course 102 with a grade of 80 or better. Lecture T 10. Laboratory, T 1.40-5. (1.40-4 during the latter part of the term when no trips are taken). Warren 201. Associate Professor WARREN.

A study of factors governing the price of land; methods of land valuation; the appraisal of land for use, for sale, for purposes of making loans, and for taxation. Fee for materials furnished, \$1.

DEPARTMENTAL SEMINAR AND RESEARCH

195. Undergraduate Research. First and second terms. Credit one to three hours depending upon the problem undertaken and the quality of the work done on it. Open to seniors by permission. Departmental staff.

This course is designed to afford opportunity for outstanding seniors to test their ability to do research. The student is expected to complete a research problem under the direction of a staff member.

299. Seminar. First and second terms. Open only to graduate students. M 4. Warren 401. Departmental staff.

AGRICULTURAL ENGINEERING

1. Farm Mechanics. First or second terms. Credit three hours. Prerequisite, reasonable proficiency in drawing; Drawing 1 recommended. Lectures: first term, T Th 9, Caldwell 100; second term, T Th 10, Warren 25. Recitation: first term, S 8, W S 9, T Th 10, or W 11; second term, W S 8, W S 9, M 10, or W 11. Agricultural Engineering Laboratories. Professor RILEY and Mr. _____.

A course planned to give training in understanding the farm application of mechanical methods and appliances and to develop ability to think and to reason in terms of these. Materials, \$1.

101. Electricity on the Farm. Second term. Credit three hours. Lectures, M W 11. Dairy Industry Building 119. Practice, T W 1.40-4. Agricultural Engineering Laboratories. Mr. _____.

A course intended to give some practical knowledge of electricity and of its uses in the home and on the farm. (If possible, a field trip to Niagara Falls power plants will be arranged at excursion rates.) Laboratory fee, \$2.50.

102. Farm Power. First term. Credit three hours. Open to juniors and seniors and to special students in their second year. Prerequisite, course 1 and a reasonable proficiency in drawing. Lectures, W F 8. East Roberts 222. Practice, M T W or Th 1.40-4. Agricultural Engineering Laboratories. Professor JENNINGS.

A study of the principles of operation and adjustments of single cylinder and multi-cylinder engines as they are used on the farm. The course includes the principles of ignition, carburetion, valve timing, and power developed for four-cycle engines, also a study of the use of Diesel engines and large-sized electric motors for farm operation. Laboratory fee, \$3.

103. Field Machinery. Second term. Credit three hours. Open to juniors and seniors and to special students in their second year. Prerequisite, course 1 and a reasonable proficiency in drawing. Lectures, W F 8. East Roberts 222. Practice, T W Th or F 1.40-4. Agricultural Engineering Laboratories. Professor JENNINGS.

A study of the use, care, operation, adjustment, and repair of farm field machinery, such as plows, drills, binders, combines, sprayers, potato diggers, and the like. Horse-drawn as well as tractor equipment is included. The selection of the size and the type of field equipment best adapted for a specified size of farm is considered. Laboratory fee, \$3.

10. Household Mechanics. First or second term. Credit three hours. For women students. Not open to freshmen. Lectures, T Th 12. Caldwell 100. Practice: first term, Th 9-11.30 or Th or F 2-4.30; second term, Th or F 2-4.30. Agricultural Engineering Laboratories. Professor ROBB.

A course intended to develop ability to think and to reason in terms of mechanical devices. Among the problems selected for this training are exercises in plumbing, soldering, and power transmission, and studies in the principles of operation, care, and repair of small mechanical devices, sewing machines, domestic electrical equipment, and automobile engines. Laboratory fee, \$2.

21. Farm Engineering. First or second term. Credit three hours. It is recommended but not required that students have training in mechanical drawing. Lectures: first term, M W 9; second term, M W 10. Dairy Industry Building 119. Practice, M or T 1.40-4. Dairy Industry Building, Fourth Floor, and field. Professor McCURDY.

A study of the practical solution of the elementary problems involved in connection with surveying and mapping the farm; leveling for farm drainage and water supply; laying out building foundations. Farm drainage, concrete, and sewage disposal are studied. Laboratory fee, \$2.

[121. **Farm Engineering, Advanced Course.** Second term. Credit two hours. Alternates with course 122. Prerequisite, course 21 or its equivalent. Professor McCURDY.] Not given in 1940-41.

A course in topographic surveying and mapping; leveling, including cross-section and earthwork computations; a study of the use and adjustment of the better class of levels and of the transit. Laboratory fee, \$1.

122. **Drainage and Irrigation.** Second term. Credit two hours. Alternates with course 121. Prerequisite, course 21 and Agronomy 1 or their equivalents. Lecture, T 10. Wing B. Field work, W 1.40-4. Professors ROBB and McCURDY.

A course covering the principles and practice of drainage and irrigation; laying out drainage for farm lands, golf courses, gardens, and roads; a study of irrigation systems for humid climates; pumping plants for drainage, irrigation, and water supply. One two-day excursion to drainage projects near Ithaca is taken sometime in May. Laboratory fee, \$1.

24. **Farm Concrete.** First term. Credit two hours. Lecture, T 11. Dairy Industry Building 119. Practice, Th or F 1.40-4. Agricultural Engineering Laboratories. Professor McCURDY.

A study of the selection, testing, and proportioning of the materials used in making concrete; building forms; mixing, placing, finishing, and curing concrete; waterproofing; inspection of local sand and gravel banks and of some local concrete structures. Laboratory fee, \$2.

31. **Farm Structures.** First term. Credit three hours. Drawing 1 recommended. Lectures, M W F 8. Fernow 122. Extension Professor GOODMAN.

A study of the plan and structure of the buildings suited to various types of farming, with emphasis on the construction, remodeling, insulation, and ventilation of dairy, horse, poultry, sheep, swine, and general-purpose buildings. Materials fee, \$1.

40. **Farm Shop Work.** First or second term. Credit two hours a term. Open to all students. Section 1, T Th 1.40-4; section 2, M F 1.40-4. Agricultural Engineering Laboratories. Professor ROEHL.

This course includes woodworking, with special jobs in carpentry, cabinet making, and fitting tool handles; metal working, with special jobs in saw fitting, tool grinding, cold-metal working, sheet-metal working, selecting and attaching builders' hardware; forge work, with special jobs in shaping and tempering tools; painting, with special jobs in repairing and refinishing furniture; harness repairing; problems in the use of rope. Mechanical drawing and free-hand sketching are done as they supplement the work. Laboratory fee, \$4.

41. **Shop Work for Rural High School Teachers.** First or second term. Credit three hours. Prerequisite, course 40. W 1.40-4 and S 8-12.50. Agricultural Engineering Laboratories. Professor ROEHL.

A course offering training for teaching in rural high-schools general shop work related to agriculture. The course includes presentation of purpose, plans, and equipment of shops, organization of course of study, and methods of teaching. In the course one learns how to teach the work outlined in course 40 and other work pertaining to rural life. Laboratory fee, \$4.

[46. **Household Carpentry, Furniture Repairing and Refinishing.** Second term. Credit two hours. For women students. Professor ROEHL.] Not given in 1940-41.

A course in such carpentry-tool work as a housekeeper can make use of; the making and finishing of several small pieces of furniture; each student to refinish a few pieces of furniture supplied by her, and do such repairing as may be necessary. Laboratory fee, \$3.

47. **Farm Blacksmithing.** First or second term. Credit one or more hours. Prerequisite, permission to register. Practice, M or W 1.40-4. Farm Practice Shop. Professor ROBB and Mr. LAYTON.

Welding of iron and ordinary steel such as is used in the parts of modern farm machinery; sharpening, shaping, and tempering of steel tools; miscellaneous forging, such as chain hooks, links, and so forth; horseshoeing for those interested and competent. Laboratory fee, \$3 for each credit hour.

251. Special Problems in Agricultural Engineering. First or second term. Credit one or more hours. Prerequisite, adequate ability and training for the work proposed, and permission to register. Professors and assistant professors of the department.

Special work in any branch of agricultural engineering on problems under investigation by the department or of special interest to the student, provided, in the latter case, that adequate facilities can be obtained. Laboratory fee for welding, \$5 for either one or two hours credit; other fees appropriate to the work undertaken.

252. Seminar. First and second terms. Credit one hour a term. Open to seniors and required of graduate students. M 4.30-5.45.

Presentation and discussion of papers on special problems in agricultural engineering. Professor ROBB.

AGRONOMY

SOIL SCIENCE

1. The Nature and Properties of Soils. First or second term. Credit five hours. Prerequisite, Chemistry 102 or 104 and Geology 100. Lectures, M W F 9. Caldwell 100. Laboratory: M T W Th or F 1.40-4. Caldwell 49. Two recitations, to be arranged. Caldwell 31. Professor BUCKMAN and Associate Professor CUMMINGS.

A comprehensive course dealing with the composition, properties, and plant relations of soils, with particular reference to the fundamental principles of maintaining soil fertility. Laboratory fee, \$3.

101. Origin, Morphology, Classification, and Mapping of Soils. Second term. Credit three hours. Prerequisite, course 1. Lectures, T Th 10. Caldwell 100. Professor HOWE.

A course dealing with the characteristics of the great soil groups, with particular reference to the soils of the United States. Attention is given to the origin and the classification of New York soils, based upon study of their morphology. A field study of soils and mapping is made. Three all-day field trips. Laboratory fee, \$3.

102. Soil Conservation. Second term. Credit two hours. Prerequisite, courses 1 and 11 or their equivalent. Lectures, T Th 11. Caldwell 100. Professor GUSTAFSON.

An analysis of the causes of the decline in the inherent productivity of soils and of the practical methods of management that will permanently maintain their productivity. The causes of erosion and its control by agronomic methods receives special emphasis. Two all-day Saturday field trips. Laboratory fee, \$4.

[**103. Organic Soils.** First term. Credit two hours. Prerequisite, course 1 and Chemistry 201. Given in alternate years. Professor B. D. WILSON.] Not given in 1940-41.

A course designed primarily for students specializing in soil technology. Emphasis is placed on the composition and properties of organic soils.

104. Forest Soils. First term. Credit two hours. Prerequisite, course 1 and Botany 31. Given in alternate years. W F 8. Room to be announced. Assistant Professor CHANDLER.

Assigned readings and semi-weekly discussions of the more important forest-soils literature. There are occasional field trips.

205. Soil Fertility, Advanced Course. First term. Credit three hours. Prerequisite, course 1 and Chemistry 201 or its equivalent. Lectures, T Th S 8. Caldwell 143. Professor BIZZELL.

The lectures are supplemented by reviews of literature and by the preparation of abstracts.

106. Soil Microbiology. Second term. Credit three hours. Prerequisite, course 1.

Bacteriology 1, and Chemistry 201 or its equivalent. Lectures, M W 8. Caldwell 143. Laboratory, W or F 1.40-4. Caldwell 201. Professor J. K. WILSON.

A course in biological soil processes designed primarily for students specializing in soil technology or bacteriology. The laboratory work is supplemented by reports and by abstracts of important papers on the subject. Laboratory fee, \$5.

207. **Physical and Chemical Properties of Soils: Lectures.** Second term. Credit three hours. Prerequisite, course 1, Physics 3 and 4, Chemistry 201. A course in physical chemistry is recommended. Lectures, T Th S 8. Caldwell 143. Professor BRADFIELD.

A study of physical and chemical processes and changes that take place in soils, with emphasis upon their practical application and significance.

208. **Physical and Chemical Properties of Soils: Laboratory.** Second term. Credit three hours. Must be preceded or accompanied by course 207. Enrollment limited to twelve students. Laboratory, M W 1.40-4. Caldwell 294. Professor BRADFIELD and Assistant Professor STAKER.

Laboratory practice in the use of physical and physico-chemical technics used in soil investigations. Laboratory fee, \$5.

209. **Research in Soil Science.** Throughout the year. Professors BIZZELL, BRADFIELD, BUCKMAN, CONN, GUSTAFSON, B. D. WILSON, J. K. WILSON, and HOWE, Associate Professor CUMMINGS, and Assistant Professors CHANDLER and STAKER.

FIELD CROPS

11. **Production of Field Crops.** First or second term. Credit four hours. Prerequisite, course 1 and Botany 1. Seniors and juniors are advised to register in the first term. First term: Lectures, M W F 10, Caldwell 100; Laboratory, T W Th or F 1.40-4, Caldwell 250. Second term: Lectures, M W F 11, Caldwell 100; Laboratory, T W 1.40-4. Caldwell 250. Professor HARTWIG.

A course dealing principally with the crops that are used for feeding livestock and poultry. Emphasis is placed on the hay, silage, pasture, and grain crops of the Northeastern States. Cultural methods, crop rotations, fertilizer practices, soil and climate adaptation, and the better varieties of the important crops, are considered. Laboratory fee, \$3.

[211. **Field Crops. Advanced Course.** Second term. Credit two hours. Prerequisite course 11, Plant Breeding 211, and Botany 31 or their equivalent. Given in alternate years. Professor HARTWIG.] Not given in 1940-41.

A literature course organized to meet the needs of students specializing in field crops. Current problems involving crops other than pasture are considered. The emphasis is on forage crops. In addition to lectures, papers are assigned for reading and abstracting.

212. **Pastures.** Second term. Credit three hours. Prerequisite, courses 1 and 11 or their equivalent. Lectures and discussions, T Th 9. Caldwell 143. Laboratory and field trip, Th 1.40-4. Assistant Professor JOHNSTONE-WALLACE.

Special attention is devoted to the principles involved in the improvement and management of pastures in humid temperate climates. Current literature is studied. Laboratory fee, \$4.

219. **Research in Field Crop Production.** Throughout the year. Professor HARTWIG and Assistant Professors JOHNSTONE-WALLACE and MUSGRAVE.

DEPARTMENTAL SEMINAR

290. **Seminar.** Throughout the year. Required of graduate students taking work in the Department. S 11-12.30. Caldwell 143.

ANIMAL HUSBANDRY

Students intending to specialize in animal husbandry are advised to register for courses 1, 10, and 20 before taking the more advanced courses.

1. **Livestock Production.** First term. Credit three hours. Lectures, W F 10.

Warren 25. Laboratory, T Th or F 1.40-4, or W 11-1. Judging Pavilion. Professors HARRISON, HINMAN, and SAVAGE, Associate Professor J. P. WILLMAN, Assistant Professors MILLER and SALISBURY, and assistants.

Introduction to types, breeds, judging, and management of livestock. Laboratory fee, \$2.

10. Livestock Feeding. First or second term. Credit four hours. Must be preceded or accompanied by Chemistry 102 or 104. First term: Lectures, M W F 11. Wing A. Laboratory, Th or F 1.40-4. Wing C. Assistant Professor MILLER and assistants. Second term: Lectures, M W F 9. Wing A. Laboratory, M T W Th or F 1.40-4. Wing C. Professor MORRISON, Assistant Professor MILLER, and assistants.

The feeding of farm animals, including the general basic principles, feeding standards, the computation of rations, and the composition and nutritive value of livestock feeds.

110. Animal Nutrition. First term. Credit three hours. For advanced and graduate students. Prerequisite: a course in human or veterinary physiology, and a course in organic chemistry. Lectures, M W F 10. Wing B. Professor MAYNARD and Assistant Professor LOOSLI.

The chemistry and physiology of nutrition and the nutritive requirements for growth, reproduction, lactation, and other body functions.

111. Animal Nutrition, Laboratory Course. First term. Credit two or three hours. Must be preceded or accompanied by course 110. Registration by permission. M W F 1.40-4. Animal Nutrition Laboratory, Dairy Industry Building. Professor McCAY.

This course is designed to familiarize the student with the application of chemical methods to the solution of fundamental problems of nutrition. Laboratory fee, \$10; breakage deposit, \$5.

213. Biochemistry of Lactation. Second term. Credit one hour. Given in alternate years. Prerequisite, course 110. One meeting a week at an hour to be arranged. Professor MAYNARD and Doctor ELLIS.

A discussion of the biochemistry of the processes involved in milk secretion and of the composition of milk as related to diet and to the blood precursors.

215. Animal Nutrition, Advanced Course. First term. Credit one hour. Prerequisite, course 110 and permission to register. One meeting a week at an hour to be arranged. Dairy Industry Building 160. Professor McCAY.

Lectures and conferences on the nutrition of animal species from the invertebrate to man, with special emphasis upon the fundamental discoveries in such fields as growth, comparative biochemistry, and physiology that have been synthesized into the modern science of nutrition.

219. Seminar in Animal Nutrition. First and second terms. Open to graduate students only. Registration by appointment. Assigned readings on selected topics, with weekly conferences. M 4.15. Professors MAYNARD, McCAY, NORRIS, and HAUCK.

A consideration of the experimental data on which the principles of animal nutrition are based, and a critical review of current literature.

20. Animal Breeding. First term. Credit three hours. Prerequisite, course 1 and either Botany 1, Biology 1, or Zoology 1. Lectures, M W 9. Wing A. Recitation, demonstration, or laboratory, for four-year students, M or T 1.40-4; for two-year students, W 1.40-4. Wing C. Assistant Professor SALISBURY and assistants.

A general outline of the principles of physiology and heredity as applied to the breeding of farm animals. Laboratory fee, \$2.

[120. Problems in Animal Breeding. First term. Credit two hours. Prerequisites, course 20 or Plant Breeding 101. Given in alternate years. For seniors and graduate students. Assistant Professor SALISBURY.] Not given in 1940-41.

A consideration of the problems involved in the improvement of the larger farm animals and the application of genetics in their solution.

125. Endocrinology, Reproduction, and Lactation. Second term. Credit two hours. Open to graduate students and upper classmen. Lectures, M W 10. Wing A. Professor ASDELL.

A general course in endocrinology, with more detailed consideration of the endocrine processes involved in reproduction and lactation.

126. Problems in Animal Physiology. First term. For graduate students. Given in alternate years. Time to be arranged. Professor ASDELL.

Assigned reading and conferences on growth, reproduction, and lactation in mammals.

229. Seminar in Animal Breeding. First and second terms. F 4.15. Poultry Husbandry Building 201. Professors HUTT and ASDELL, and members of Poultry Husbandry and Animal Husbandry Staffs.

30. Health and Diseases of Animals. First term. Credit three hours. Not open to freshmen or to those who have had no courses in animal husbandry. Lectures, M W F 11. Veterinary College. Professor BIRCH.

The course is designed to give the student a clear conception of the causes and nature of the diseases of animals, with suggestions for their prevention. Special attention is given to the methods of preventing the spread of the infectious and epizootic diseases. Such information as is practicable is given for the treatment of slight injuries and for first aid in emergencies.

40. The Horse. Second term. Credit three hours. Lectures, T Th 9. Wing B. Practice, W 1.40-4. Judging Pavilion. Assistant Professor SALISBURY.

A general course treating of the horse and the mule. Judging, care and management, economy in feeding, breeding, and stable management, including harnessing, hitching, and the like. Origin, history, and development of the breeds of horses. Laboratory fee, \$2.

41. Livestock Judging, Beef Cattle, Horses, Sheep, and Swine. First term. Credit two hours. Prerequisite, course 1. The course should be taken preferably in the junior year. Lecture and laboratory period, W 1.40-4.50. Judging Pavilion. Assistant Professor MILLER.

A beginning course in judging market and breeding classes of beef cattle, horses, sheep, and swine, with major emphasis on a detailed study of the type of livestock which best meets present-day demands. Laboratory fee, \$2.

42. Livestock Judging, Beef Cattle, Horses, Sheep, and Swine. Second term. Credit two hours. Students may register for only one laboratory period for one hour of credit by permission of instructor. Prerequisite, course 41 or permission to register. Practice, T Th 1.40-4. Judging Pavilion and Livestock Barns. Assistant Professor MILLER.

A course in judging market and breeding classes of beef cattle, horses, sheep, and swine, with major emphasis on a study of the type of breeding stock which best meets modern demands. One field trip of about two-days duration is made to give additional opportunities to study livestock in outstanding herds or flocks, estimated cost, \$10. Laboratory fee, \$2.

43. Advanced Livestock Judging. First term. Credit two hours. Registration by permission. Laboratory periods, T F 1.40-4.50. Judging Pavilion and Livestock Barns. Assistant Professor MILLER.

An advanced type study of purebred market and breeding classes of beef cattle, horses, sheep, and swine. Intended primarily to give additional training to successful students of course 42. Two two-day field trips are taken on week ends; estimated cost, \$10. Members of this group are selected to represent the institution in intercollegiate judging competitions. Laboratory fee, \$2.

50. Dairy Cattle. Second term. Credit three hours. Lectures. T Th 10. Wing A. Practice, M or Th 1.40-4. Wing A and Judging Pavilion. Professors SAVAGE and HARRISON, and assistants.

Origin, history, and development of the breeds of dairy cattle; methods of breeding; economy of feeding; production of milk; care, management, and sanitation of the dairy herd. Practice in judging, scoring, tracing pedigrees, and keeping records. Laboratory fee, \$2.

51. Advanced Judging, Dairy Cattle. Second term. Credit one hour. Must be preceded or accompanied by course 50. Saturdays after Easter recess. Hours by appointment. Successful students may also register for one hour in the succeeding fall term. Professor HARRISON. One two-day trip and trips on Saturdays after spring recess are required, estimated cost, \$15.

150. Dairy Cattle, Advanced Course. Second term. Credit two hours. Prerequisite, course 50. Lecture, W 11. Practice, W 1.40-4. Wing E. Professor HARRISON.

Analysis of breeding operations in successful breeding establishments. Formulating a breeding program. Selection of foundation females and herd bulls, and special problems in the feeding and management of the purebred dairy herd.

60. Beef Cattle. Second term. Credit three hours. Not open to freshmen. Lectures, W F 10. Wing C. Practice, F 1.40-4. Judging Pavilion. Professor HINMAN.

Origin, history, and development of the breeds of beef cattle; herd management; feeding for fattening; practice in judging. Lectures, recitations, discussions, reports, tracing of pedigrees, and field trips. Field trips, two and one-half days total, estimated cost, \$6. Laboratory fee, \$2.

70. Swine. Second term. Credit three hours. Lectures, W F 11. Wing C. Practice, T 1.40-4. Judging Pavilion. Associate Professor J. P. WILLMAN.

Origin, history, and development of the breeds of swine; herd management; practice in judging swine; and reports on assigned topics. Lectures, recitations, discussions, and field trips intended to give the student a knowledge of the feeding, management, production, and marketing of swine. One-day field trip, estimated cost, \$4. Laboratory fee, \$2.

80. Sheep. First term. Credit three hours. Lectures, T Th 10. Wing B. Practice, M 1.40-4. Judging Pavilion. Associate Professor J. P. WILLMAN.

Origin, history, and development of the breeds of sheep; flock management; feeding and fattening lambs; practice in judging. Lectures, recitations, discussions, reports, and field trips intended to give the student a knowledge of the management, production, and marketing of sheep and lambs. One-day field trip, estimated cost, \$4. Laboratory fee, \$2.

90. Meat and Meat Products. First or second term. Credit three hours. Not open to freshmen. Lecture, M 8. Wing A. Two laboratory periods a week, one slaughter section, and one cutting section. Slaughter sections, M 1.40-4, W 8-10.30, or W 1.40-4. Cutting sections, M 9.40-12 or F 1.40-4. One required inspection trip to Buffalo stockyards and slaughterhouses; estimated cost, \$12. Professor HINMAN and Mr. SCHUTT.

A course in the slaughtering of farm animals, the cutting of carcasses, and the preparing and curing of meats. One two-day field trip, estimated cost, \$12. Laboratory fee, \$2.

91. Meat and Meat Products. First or second term. Credit two hours. Open to sophomores, juniors, and seniors in Hotel Administration only. Lecture, M 8. Wing B. Laboratory period, T 1.40-4. Wing B and Meat Laboratory. One required trip as in course 90. Professor HINMAN and Mr. SCHUTT.

A course in wholesale and retail buying, cutting, curing, and preparation of meats. One two-day field trip, estimated cost, \$12. Laboratory fee, \$2.

92. Meat and Meat Products. First or second term. Credit one hour. Open especially to the students of the College of Home Economics. Registration limited to fifteen students. Laboratory and lecture period, Th 2-4.20. Wing B and Meat Laboratory. Professor HINMAN and Mr. SCHUTT.

A course in wholesale and retail buying, cutting, curing, and preparation of meats. Laboratory fee, \$2.

93. Meat Cutting. First or second term. Credit one hour. Prerequisite, course 90, 91, or 92. Enrollment limited to five students a section. Laboratory and lecture period. T Th or S 8-10.30. Meat Laboratory and Meat Lecture Room. Professor HINMAN and Mr. SCHUTT.

A course dealing with the principles and practice of meat selection, cutting, and wrapping. Laboratory fee, \$2.

200. Research. First and second terms. Credit and hours by arrangement. For advanced students only. Professors MORRISON, MAYNARD, SAVAGE, McCAY, HARRISON, ASDELL, and HINMAN, Associate Professor J. P. WILLMAN, and Assistant Professors MILLER and SALISBURY.

The amount of the laboratory fee depends upon the nature of the problem undertaken.

201. Seminar. First and second terms. Required of all graduate students taking either a major or a minor subject in Animal Husbandry. Advanced undergraduates will be admitted by permission, and, if a satisfactory report on an approved subject is presented, may receive not to exceed two-hours credit. M 11. Professor MORRISON and departmental staff.

BACTERIOLOGY

Exemption from the farm-practice requirement because of specialization in bacteriology will be granted only to those students who follow the prescribed courses outlined by the department, whose record in all courses taken in the university approximates an average of 82, and whose record in courses in bacteriology is entirely satisfactory.

1. General Bacteriology. First term. Credit six hours. Prerequisite, Chemistry 102 or 104. Lectures, M W F 11. Dairy Industry Building 218. Laboratory practice, M W F 1.40-4. Dairy Industry Building 301. Professor STARK, Assistant Professor GUNSALUS, and assistants.

An introductory course; a general survey of the field of bacteriology, with the fundamentals essential to further work in the subject. Laboratory fee, \$15.

3. Agricultural Bacteriology. First term. Credit three hours. Not accepted as prerequisite for advanced courses. Primarily for freshmen and two-year students. Lectures, M W F 9. Plant Science 233. Professor STARK.

The elements of bacteriology, with a survey of the relation of microorganisms to agriculture.

4. Household Bacteriology. Second term. Credit three hours. Prerequisite, Elementary Chemistry. Limited to students in Home Economics. Lectures, T Th 10. Dairy Industry Building 218. Laboratory, T Th 8-9.50, or T Th 11-12.50. Dairy Industry Building. Professor STARK and assistants.

An elementary, practical course for students in Home Economics. Laboratory fee, \$10.

103. Applied Bacteriology. Second term. Credit six hours. Prerequisite, course 1, quantitative analysis, and organic chemistry. Lectures, recitations, and laboratory practice, M W F 1.40-5. Dairy Industry Building 218 and 301. Professor SHERMAN, Assistant Professor GUNSALUS, and assistants.

The important groups of bacteria that are of significance in water, milk, and foods, together with the methods used in the bacteriological analysis and control of these products. Laboratory fee, \$15.

105. Higher Bacteria and Related Microorganisms. First term. Credit four hours. Prerequisite, course 1. Lectures, recitations, and laboratory practice, T Th 1.40-5. Dairy Industry Building 119 and 323. Assistant Professor KNAYS and Mr. SMILEY.

A study of the higher bacteria, together with the yeasts and molds that are of especial importance to the bacteriologist. Laboratory fee, \$15.

106. Soil Microbiology. (Same as Agronomy 106.) Second term. Credit three hours. Prerequisite, course 1, Agronomy 1, and Chemistry 201 or its equivalent. Lectures, M W 8. Caldwell 143. Laboratory, W or F 1.40-4. Caldwell 201. Professor J. K. WILSON.

A course in biological soil processes designed primarily for students specializing in soil technology or bacteriology. The laboratory work is supplemented by reports and by abstracts of important papers on the subject. Laboratory fee, \$5.

Pathogenic Bacteriology. (See the Announcement of the New York State Veterinary College.)

210. **Physiology of Bacteria.** First term. Credit two hours. Prerequisite, course 1, at least one additional course in bacteriology, and one in organic chemistry. Lectures, T Th 8. Dairy Industry Building 120. Professor RAHN.

The physiology of bacteria and the biochemistry of microbic processes.

210a. **Physiology of Bacteria, Laboratory.** Second term. Credit three hours. Must be preceded by course 210. M 11 and M W 1.40-5. Dairy Industry Building. Professor RAHN and Mr. TANNER.

A laboratory course dealing with the biological principles of growth, fermentation, and death of bacteria. Laboratory fee, \$15.

211. **Taxonomy of Bacteria.** Second term. Credit two hours. Prerequisite, four terms of bacteriology. Lectures, W F 11. Dairy Industry Building 120. Professor RAHN.

The principles and methods used in the classification of bacteria, and the difficulties encountered because of variability.

212. **Selected Topics in Bacteriology.** Throughout the year. Credit one hour a term. For seniors and graduate students. F 8. Dairy Industry Building 120. Professor RAHN.

The topics change each term. For 1940-41, the topics are: first term, *The Yeast Industries*; second term, *Bacteriology of Water and Sewage*. For 1941-42: first term, *Food Industries*, second term, *Disinfection*.

213. **Morphology and Cytology of Bacteria.** First term. Credit two hours. For seniors and graduate students. Lectures, W F 4.40. Dairy Industry Building 119. Assistant Professor KNAYSİ.

The morphology, cytology, and microchemistry of microorganisms.

220. **Research.** First or second term. Credit one or more hours, by arrangement. For advanced students.

Special problems in any phase of bacteriology may be elected.

221. **Seminar.** Throughout the year. Without credit. Required of graduate students specializing in the department; open to undergraduate students taking advanced work. Hours to be arranged. Dairy Industry Building. Professor SHERMAN.

BOTANY

Students wishing instruction in special groups of plants or in special subjects should consult the department.

1. **General Botany.** Throughout the year. Credit three hours a term. If taken after Biology 1, credit two hours a term. Lectures, T Th 9 or 11. Plant Science 233. Laboratory, one period of two and one-half hours. Plant Science 240, 242 and 262. Professor PETRY, instructors, and assistants.

A survey of the fundamental facts and principles of plant life. The work of the first term deals with the structures and functions of the higher plants, with special emphasis on their nutrition. The work of the second term traces the evolution of the plant kingdom, as illustrated by representatives of the principal groups, and concludes with a brief introduction to the principles of classification of the flowering plants. Laboratory fee, \$3.50 a term.

[102. **Nonvascular Plants.** First term. Credit four hours. Prerequisite, course 1 or its equivalent. Mr. FORD.] Not given in 1940-41.

13. **Trees and Shrubs.** First term. Credit four hours. Prerequisite, course 1 or its equivalent. Lectures, T Th 8. Plant Science 143. Laboratory or field work, M W or T Th 1.40-4. Plant Science 211. Professor MUENSCHER.

The identification of trees and shrubs in summer and in winter conditions. During the first part of the term the work covering identification is done largely in the field. The work of the latter part of the term is a study of the taxonomy of woody plants. Laboratory fee, \$4.

53. **Poisonous Plants.** Second term. Credit one hour. Registration by permission. Discussion and demonstrations, F 1.40-4. Plant Science 353. Professor MUENSCHER and Doctor JUSTICE.

Special emphasis is placed on the identification, poisonous properties, and distribution of poisonous plants. Laboratory fee, \$1.

55. Weed Identification and Control, and Seed Analysis. First term. Credit three hours. Prerequisite, course 1 or its equivalent. Lecture, F 8. Plant Science 143. Laboratory, W F 1.40-4. Plant Science 353. Professor MUENSCHER and Doctor JUSTICE.

Special emphasis is given to the habits, characteristics, and properties which make weeds harmful or undesirable, the losses and injury produced by them, and the method for their prevention, eradication, and control. Field and laboratory practice in the identification of weeds and seeds and practice in the recognition of seed impurities are provided. Students wishing to do additional or special work on seed analysis or testing may register in course 171. Laboratory fee, \$3.

115. Aquatic Plants. Second term. Credit three hours. Prerequisite, course 1 or its equivalent. Lecture, T 9. Laboratory, M W 1.40-4. Plant Science 353. Professor MUENSCHER.

A study of the taxonomy and ecology of fresh-water plants, beginning with the algae and concluding with the aquatic angiosperms. Laboratory fee, \$4.

117. Taxonomy of Vascular Plants. Second term. Credit four hours. Prerequisite, course 1 or its equivalent. Lecture, M 9. Plant Science 143. Laboratory, M W F 1.40-4. Plant Science 211. Professor WIEGAND.

A study of the kinds of seed plants and ferns, their classification into genera, families, and orders, and field work on the local flora. Emphasis is placed on wild plants, but the more common cultivated plants receive some attention. The course is planned to follow course 1 and to furnish an introduction to the knowledge of field botany and classification of the higher plants, in preparation for special work in various departments, and as an aid in teaching. Instruction is given in the preparation of an herbarium and of keys. Laboratory fee, \$4; deposit, \$5.

Several afternoon and one or two all-day field trips are scheduled in May. Students completing this course may arrange, under course 171, to pursue special advanced work in taxonomy.

219. Advanced Taxonomy of Vascular Plants. Second term. Credit one or two hours. Prerequisite, course 117 or its equivalent. Open only to major students in botany and to graduate students. Hours to be arranged. Plant Science 211. Professor WIEGAND.

Special round-table discussion of topics of particular interest to the taxonomist. One hour may be devoted to practical work on some group of plants.

123. Plant Anatomy. First term. Credit four hours. Prerequisite, course 1 or its equivalent, and permission to register. Lecture, T 9. Plant Science 143. Laboratory, T 10-12.30; Th S 9-11.30. Plant Science 228. Professor EAMES and assistants.

This course is designed to give a working acquaintance with the internal morphology of vascular plants, and emphasis is placed on practice in interpretation and determination of material. The course is planned primarily for students in applied fields of botany, such as pathology, pomology, or genetics. Students desiring a less detailed training in this subject should take course 126. Laboratory fee, \$5.

124. Cytology. First term. Credit four hours. Prerequisite, course 1 or Zoology 1 or its equivalent. Lectures, M W 9. Plant Science 143. Laboratory, M W or T Th 10-12.30 or T Th 1.40-4. Assignment to laboratory section must be made at time of registration. Plant Science 219. Professor L. W. SHARP.

The principal topics considered are protoplasm, cells and their components, nuclear and cell division, meiosis and fertilization, and the relation of these to the problems of development, reproduction, and heredity. Both plant and animal materials are used. Microtechnic is not included. Laboratory fee, \$5.

224. Advanced Cytology. Second term. Credit two hours. Prerequisite, course 124, Plant Breeding 101, and permission to register. Lecture, W 9. Plant Science 141. Laboratory and seminar to be arranged. Professor L. W. SHARP.

An advanced course dealing mainly with the physical basis of heredity and with recent researches in cytogenetics.

[125. **Microtechnical and Microscopical Methods.** Second term. Credit five hours. Prerequisite, permission to register.] Not given in 1940-41.

126. **Morphology of Vascular Plants.** Second term. Credit three hours. Prerequisite, course 1 or its equivalent, and permission to register. Lecture, T 9. Plant Science 143. Laboratory, T 10-12.30, Th 9-11.30. Plant Science 228. Professor EAMES.

An advanced course in the comparative morphology, life histories, and phylogeny of vascular plants. Laboratory fee, \$5.

Comparative Morphology of Fungi. Given in the Department of Plant Pathology.

31. **Plant Physiology.** First or second terms. Credit four hours. Prerequisite, course 1 and introductory chemistry. Lectures, T Th 10. Plant Science 233. Laboratory, T Th 1.40-4 or W F 1.40-4. Plant Science 227. Professors KNUDSON or O. F. CURTIS, Assistant Professor CLARK, and assistants.

This course is designed to acquaint the student with the general principles of plant physiology. Topics such as water relations, photosynthesis, translocation, digestion, respiration, mineral nutrition, growth, and reproduction are studied in detail. Particular emphasis is placed, both in laboratory and classroom, on the discussion of principles and their applications to plants. Laboratory fee, \$4; deposit \$3.

231. **Plant Physiology, Advanced Lecture Course.** Throughout the year. Credit three hours a term. Prerequisite, training in botany and chemistry, to be determined in each case by the department. Limited to seniors and graduate students. Lectures, M W F 10. Plant Science 143. Professors KNUDSON and O. F. CURTIS.

232. **Plant Physiology, Advanced Laboratory Course.** Throughout the year. Credit three hours a term. Prerequisite or parallel, course 231. Laboratory M 1.40-4, S 8-12.30. Plant Science 241. Professors KNUDSON and O. F. CURTIS and Assistant Professor CLARK. Laboratory fee each term, \$10; breakage deposit, \$5.

233. **Seminar in Plant Physiology.** Throughout the year. Required of graduate students taking work in the department. Conference, F 11. Plant Science Seminar Room. Professors KNUDSON and O. F. CURTIS, and Assistant Professor CLARK.

The presentation and discussion of current contributions to plant physiology; reports on the research problems of graduate students and members of the staff.

161. **History of Botany.** Second term, without credit. Hours to be arranged. Seminar Room, Plant Science.

A course of lectures given by various members of the staff with the purpose of acquainting advanced students of botany with the historical development of their science.

171. **Special Problems in General Botany, Taxonomy, Morphology, Anatomy, Paleobotany, Economic Botany, Cytology, and Physiology.** Throughout the year. Credit not less than two hours a term. By appointment. Professors WIEGAND, KNUDSON, EAMES, L. W. SHARP, O. F. CURTIS, PETRY, MUENSCHER, and RANDOLPH, and Assistant Professor CLARK.

Students engaged in special problems or making special studies may register in this course. They must satisfy the instructor under whom the work is taken that their preparation warrants their choice of problem. The laboratory fee depends on the nature of the work and on the number of credit hours.

DAIRY INDUSTRY

Students intending to specialize in Dairy Industry are urged to elect qualitative and quantitative analysis, organic chemistry, and general bacteriology, in order that these courses may be completed by the end of the first term of the junior year.

1. **Introductory Dairy Science.** First or second term. Credit three hours. Prerequisite, Chemistry 102 or 104. Lectures, T Th 11. Dairy Industry Building 218. Laboratory: first term, M or F 1.40-4.30 or S 9-12; second term, M or Th 1.40-4.30. Dairy Industry Building 209. Professor HERRINGTON and Messrs. BRERETON and WHITE.

The scientific and practical aspects of milk and a survey of the dairy industry. Especial attention is given to the composition of milk and its physical and chemical properties, quantitative tests for fat and other constituents. Laboratory fee, \$7.

5. Technical Control of Dairy Products. Second term. Credit one hour. Prerequisite, course 1. Lecture and laboratory practice, Th 1-6. Three sections of one-third term each. Dairy Industry Building 120. Professor HERRINGTON and Mr. BRERETON.

The analysis of dairy products by factory methods. Laboratory fee, \$5.

102. Market Milk and Milk Inspection. Second term. Credit five hours. Prerequisite, course 1, and Bacteriology 1 or its equivalent. Lecture and laboratory practice, T Th 12.30-5.30. Dairy Industry Building 218 and 146. Professor BRUECKNER and Assistant Professor AYRES.

The scientific, technical, and sanitary aspects of the fluid-milk industry. Laboratory fee, \$10.

103. Milk-Products Manufacturing. First term. Credit five hours. Prerequisite, course 1, and Bacteriology 1 or its equivalent. Lectures, recitations, and laboratory practice, T Th 10-3.30. Dairy Industry Building 120. Professor GUTHRIE, Assistant Professor AYRES, and Mr. NAYLOR.

The principles and practice of making butter, cheese, and casein, including a study of the physical, chemical, and biological factors involved. Consideration is given also to commercial operations and dairy-plant management. Laboratory fee, \$10.

104. Milk-Products Manufacturing. Second term. Credit five hours. Prerequisite, course 1; should be preceded or accompanied by course 5. Lectures, recitations, and laboratory practice, F 12-5, S 8-1. Dairy Industry Building 120. Assistant Professor AYRES and Mr. NAYLOR.

The principles and practice of making condensed and evaporated milk, milk powders, ice cream, and by-products, including a study of the physical, chemical, and biological factors involved. Laboratory fee, \$10.

108. Commercial Grades of Dairy Products. Second term. Credit one hour. Should be preceded by courses 103 and 104. Lectures, recitations, and laboratory practice, T 8-10 p.m. Professor GUTHRIE and Assistant Professor AYRES.

The classification of dairy products and the factors involved in grading them. Laboratory fee, \$5.

111. Analytical Methods. Second term. Credit four hours. Prerequisite, quantitative analysis. Lecture, T Th 10. Laboratory practice, T 1-5. Dairy Industry Building 120. Professor HERRINGTON and Mr. STEWART.

The chemical analysis of products and materials important in the dairy and food industries. Laboratory fee, \$10.

112. Chemistry of Biological Materials. First term. Credit three hours. Prerequisite, analytical and organic chemistry, and college physics. M W F 12. Dairy Industry Building 119. Assistant Professor HAND.

A fundamental treatment of the physico-chemical processes occurring in living cells and other biological materials.

113. Chemistry of Milk. First term. Credit two hours. Prerequisite, qualitative and quantitative analysis and organic chemistry; must be preceded or accompanied by course 112 or its equivalent. Lectures, M W 8. Dairy Industry Building 119. Professor P. F. SHARP.

A consideration of milk from the physico-chemical point of view.

Dairy Bacteriology (See Bacteriology 103.)

220. Chemistry of Milk Products. Second term. Credit four hours. Prerequisite, course 113. Lectures, M T W Th 8. Dairy Industry Building 120. Professor P. F. SHARP.

An advanced consideration of the chemical and physical aspects of milk products.

251. Research. First or second term. Credit one or more hours, by arrangement. For advanced students.

Special problems in any phase of dairy work may be elected.

252. **Seminar.** Throughout the year. Without credit. Required of graduate students taking work in the department; open to undergraduate students taking advanced work. Hours to be arranged. Dairy Industry Building. Professor SHERMAN.

DRAWING

1. **Mechanical Drawing.** First or second term. Credit three hours. Lectures during laboratory periods. Laboratory: section 1, T 1.30-4, and S 8-10.30; section 2, W F 1.40-4. Two additional practice periods to be arranged to suit the schedule of the student. Dairy Industry Building, Fourth Floor. Students must apply at the time of registration regarding materials required. Assistant Professor REYNA.

A course dealing with the principles and practices involved in the art of conveying information by graphical methods. The work includes use of instruments; lettering; orthographic projection involving plans, elevations, and sections; isometric drawing; and the practical applications of these principles to simple problems. This course may well be taken early by students interested in agricultural engineering. Materials fee, 50 cents.

3. **Mechanical Drawing.** First or second term. Credit three hours (two hours for those who have taken course 1.) Primarily for students of nursery landscape. Lectures during laboratory periods. Practice periods arranged to suit students' schedules. Laboratory, Th 1.40-4 and S 10-12. Dairy Industry Building, Fourth Floor. Students must apply at the time of registration regarding materials required. Assistant Professor REYNA.

This course embraces the elements of orthographic projection and mechanical perspective. Laboratory fee, 50 cents.

5. **Mechanical Perspective Drawing.** First or second term. Credit two hours. Lectures during laboratory periods. Laboratory, Th 1.40-4, S 10-12. Dairy Industry Building, Fourth Floor. Assistant Professor REYNA.

A course in perspective representation by mechanical methods, embracing all the fundamentals necessary for practical application to architectural or shop problems. Laboratory fee, 50 cents.

11. **Free-Hand Drawing.** First and second terms. Credit from two to four hours a term. One hour of credit means three hours of actual practice. Lectures during practice. Practice by appointment, daily 9-12.50 and 1.40-4, except S morning. East Roberts 371. Assistant Professor GARRETT and Mr. PASTO.

An elementary course for the development of graphic expression applicable to scientific studies. Of special value to those who expect to enter the field of teaching, nature study, or biological research. Laboratory fee, 50 cents.

12. **Free-Hand Drawing, Advanced Course.** First and second terms. Credit from two to four hours. Prerequisite, four hours of course 11 or its equivalent. Lectures during practice. Practice same as course 11. East Roberts 371. Assistant Professor GARRETT and Mr. PASTO.

Laboratory fee, 50 cents.

13. **Pen-and-Ink Drawing.** First and second terms. Credit from two to four hours. Prerequisite, four hours of course 11 or its equivalent. Practice, same as course 11. East Roberts 371. Assistant Professor GARRETT and Mr. PASTO.

Laboratory fee, 50 cents.

14. **Water Color.** First and second terms. Credit from two to four hours. Prerequisite, four hours of course 11 or its equivalent. Practice, same as course 11. East Roberts 371. Assistant Professor GARRETT and Mr. PASTO.

Laboratory fee, 50 cents.

15. **Free-Hand Perspective.** First or second term. Credit three hours a term. Prerequisite, course 3 and at least three hours of course 11. Lectures and criticisms, T Th 12. Drafting periods according to schedule of student. East Roberts 341. Assistant Professor GARRETT and Mr. PASTO.

A course in appearance drawing from data, with special emphasis on represen-

tation of tree forms and foliage; intended primarily for landscape-service students. Laboratory fee, 50 cents.

16. **Picture Study.** First or second term. Credit one hour a term. Open to sophomores, juniors, and seniors who have had at least two hours of Free-Hand Drawing. Registration limited to twelve students. Lectures, W F 12. East Roberts 341. Assistant Professor GARRETT.

ENTOMOLOGY AND LIMNOLOGY

For related work, see the courses listed under the heading *Zoology* in this announcement, and in the announcement of the College of Arts and Sciences.

BIOLOGY

1. **General Biology.** Throughout the year. Credit three hours a term; both terms of the course must be completed to obtain credit, unless the student is excused by the department. First term not prerequisite to second. Not open to students who have had both Zoology 1 and Botany 1. If Biology 1 is taken after either Zoology 1 or Botany 1, credit two hours a term. Lectures and demonstrations, M W 9 or 11. Roberts 392. One practice period a week. Roberts 301 and 302. Acting Assistant Professor HOOD, Doctor NEVIN, and assistants.

An elementary course planned to meet the needs of students majoring outside of the plant and animal sciences; particularly adapted as the first year of a two-year sequence in biology for the prospective teacher of general science in the secondary schools. The course deals with the nature of life, life processes, the activities and origin of living things. It covers the organization of representative plants and animals, including man as an organism, and the principles of nutrition, growth, behavior, reproduction, heredity, and evolution. Fee, \$3.50 a term.

5. **Laboratory Methods in Animal Biology.** Second term. Credit two or three hours. Prerequisite, Biology 1 or Zoology 1 and permission to register. Lecture and laboratory, T or F 10-12.30, and one or more periods by appointment. Roberts 302. Doctor NEVIN and cooperating specialists.

For students who intend to teach or to follow some phase of zoology as a profession. This course includes such subjects as: laboratory equipment; collection, preservation, and storage of materials; sectional and non-sectional preparations of animal tissues for histological study; injection of blood vessels and embalming; preparation of bird and mammal skins for study; chart making; introduction to photography including the preparation of lantern slides; use of micro projector; theory and use of 16-millimeter sound and silent projection apparatus. Laboratory fee, \$5 or \$7.50.

GENERAL ENTOMOLOGY

Students accepted for major work in entomology must complete, before graduation, three hours in general entomology, six hours in insect morphology, one hour in wing venation, six hours in insect taxonomy (course 31), three hours in economic entomology, three hours in either insect physiology or insect ecology, six hours in college physics, six hours in college chemistry, and the equivalent of one college year in French and the same in German. They must also satisfy a requirement in entomological field practice.

A student planning to major in entomology must make application to the Department, preferably at the end of his first year, and he must at the same time give notice of this action to the Office of Resident Instruction. To be acceptable as a major student he must have maintained and continue to maintain an average of at least 80 in his work in natural sciences (physics, chemistry, geology, biological subjects).

Major students in entomology must meet the farm-practice requirement applicable to students of the College generally, except in so far as entomological field practice may be substituted therefor. A minimum of entomological field practice is required in any case, and this minimum, together with additional work as outlined by the Department, may be substituted for farm practice. Whatever the combination of farm experience and entomological experience that is pre-

mented, the work must be completed under the same provisions as those specified for the farm-practice requirement.

12. General Entomology. First term. Credit three hours. Prerequisite, Biology 1, Zoology 1, or Botany 1. Lectures, W F 9. Comstock 245. Professor MATHESON. Practical exercises, T W Th or F 1.40-4, or S 8-10.30. Comstock 200. Professor MATHESON, and Messrs. BELKIN and REHN.

Lectures on the characteristics of orders, suborders, and the more important families, and on the habits of representative species; practical exercises in studying the structure of insects, their biology, and their classification. The lectures only (two hours) may be taken by those who have had courses 15, 21, and 30a. Laboratory fee, \$2.50.

15. Wing Venation and Evolution. Second term. Credit one hour. Prerequisite, course 12. Required of all students who plan to take advanced work in entomology. Lecture, T 12, and two additional hours T Th morning by appointment. Comstock 300. Professor BRADLEY and Mr. PATE.

A laboratory study of evolutionary series as illustrated by progressive modification of the wings of insects.

16. Insect Ecology. First term. Credit three hours. Prerequisite, Biology 1 or Zoology 1, and Entomology 12. T Th 9. Comstock 145. Laboratory, Th 1.40-4. Comstock 110. Professor PALM and Mr. UHLER.

A general study of insects in relation to their environment. Attention is given to life-history studies in the field and insectary; the rôle that insects play in different natural associations; the relations between structure, instinct, habitat, and ways of living. Photographing insects in the field and laboratory is included as a part of the course. Laboratory fee, \$2.50.

117. Entomological Aspects of Biological Problems. First term. Credit one hour. Open to upperclass and graduate students whose major interest is in biological science. Lectures, M 10. Comstock 145. Doctor FORBES.

A review of the contributions of entomology to the study of certain more general biological problems, such as distribution, coloration, relation to environment, and the question of species. Some consideration is given also to the history of entomology and to museums, explorations, and other means that are used in its development.

118. The Technics of Biological Literature. First term. Credit three hours. Lectures, M F 11. Comstock 300. Library work by assignment. Professor BRADLEY.

A critical study of the biologists' works of reference. Practice in the use of generic and specific indices and of bibliographies, and in the preparation of the latter; methods of preparing technical papers for publication; zoological nomenclature. This course is of a technical nature, and is intended to aid students specializing in zoology or entomology in their contact with literature.

INSECT MORPHOLOGY

122. Insect Morphology, Anatomy, and Histology. Throughout the year. Credit three hours a term. Prerequisite, course 12. Lecture, T 10. Comstock 145. Laboratory, M W 1.40-4. Comstock 270. Doctor BUTT and Mr. METCALF.

A study of external and internal anatomy of insects. Laboratories include gross dissection and histological studies of internal organs of representative insects. Laboratory fee, \$3.

123. Insect Embryology and Post Embryonic Development. Second term. Credit two hours. Prerequisite, courses 12 and 122. Lecture, Th 10. Comstock 145. Laboratory, Th 1.40-4. Comstock 270. Doctor BUTT.

Lectures with assigned reading and reports by students. Laboratory fee, \$3.

124. Insect Histology: Technic. First or second term. Credit two hours. Prerequisite, courses 12 and 122. Two laboratories a week by appointment. Comstock 265. Dr. BUTT.

The technic of preparing, sectioning, and mounting insect tissues for study. Laboratory fee, \$3.

INSECT TAXONOMY

30a. Elementary Taxonomy of Insects. Second term. Credit one hour. Prerequisite, course 15 and one term of course 122. Laboratory and field work, F 1.40-4. Comstock 300. Professor BRADLEY and Mr. PATE.

Practice in determining the orders and families of insects. Laboratory fee, \$2.25.

[30b. Elementary Taxonomy of Insects. Second and first terms, beginning after spring recess. Credit one hour second term and one or two hours the following first term, credit given only on the completion of the course. Open to freshmen. Professor BRADLEY.] Not given in 1940-41.

Methods of collecting insects and preserving them for study, and other matters of technic. Problems are assigned to be completed during the summer and fall and reported on during the fall term. Laboratory fee (spring term only), \$2.25, and expense of trips, including one all-day trip.

31. Taxonomy of Insects. This course extends through three terms, but the work of any term may be taken independently. Credit three hours. Prerequisite, courses 122, 15, and 30a. Lecture, W 10. Laboratory, T Th 1.40-4. Comstock 300. Professor BRADLEY, Doctor FORBES, and Mr. PATE.

A survey of the classification of the orders of insects. For the year 1940-41, the orders to be treated are: first term, Lepidoptera, Coleoptera; second term, Hymenoptera and Hemiptera. Laboratory fee, \$4.50 a term.

132. Classification of Aquatic Insects. First term. Credit two hours. Prerequisite, course 12. Laboratory, F 1.40-4 and one period Saturday morning. Comstock 300. Professor BRADLEY and Mr. PATE.

This course is intended primarily for students preparing to take limnology. Laboratory fee, \$4.

ECONOMIC ENTOMOLOGY

41. General Economic Entomology. Second term. Credit three hours. Prerequisite, course 12 or Zoology 1. Juniors and seniors may be admitted without prerequisites with the permission of the professor in charge. Lectures, W F 9. Comstock 145. Professor READIO. Practical exercises, M W or F 1.40-4. Comstock 100. Messrs. MIDDLEKAUFF and BODENSTEIN.

Lectures on the life histories and habits of injurious insects, and on the methods of control; practical exercises on the commoner pests and the more important insecticides, as time permits; several field excursions. Laboratory fee, \$2.

241. Advanced Economic Entomology. First and second terms. Credit two hours a term. Open to qualified seniors and graduate students. Lecture, M 11. Conference, W 2-4. Comstock 145. Professor READIO.

A course for the student intending to work in the field of economic entomology, including such subjects as: principles of insect control by natural agencies, biological control methods, inspection and quarantine regulations, cultural practices, physical methods, and use of insecticides; methods of planning and conducting experiments in insect control; insectary methods of rearing and studying insects; literature of economic entomology. The course is given cooperatively by the Division of Entomology of the New York State Agricultural Experiment Station at Geneva and the extension and research staffs of the Department of Entomology at Cornell University.

[43. Insects Injurious to Trees and Shrubs. Second term. Credit two hours. Prerequisite, course 12. Professor READIO and Mr. MIDDLEKAUFF.] Not given in 1940-41.

A consideration of the chief insects injurious to shade trees, to trees of the farm woodlot, and to ornamental shrubs. Methods of control are stressed. Laboratory fee, \$1.50.

PARASITOLOGY AND MEDICAL ENTOMOLOGY

51. Parasites and Parasitism. Second term. Credit two hours. Prerequisite, Biology 1 or Zoology 1. Lecture, Th 9. Comstock 245. Practical exercises, Th or F 1.40-4. Comstock 200. Professor MATHESON, and Messrs. BELKIN and REHN.

A consideration of the origin and biological significance of parasitism, and of the structure, life, and economic relations of representative parasites. Laboratory fee, \$2.

52. **Medical Entomology.** Second term. Credit two hours. Prerequisite, Zoology 1 or Biology 1. Lecture, T 9. Comstock 245. Laboratory, T or W 1.40-4. Comstock 200. Professor MATHESON, and Messrs. BELKIN and REHN.

This course deals with insects and other arthropods that are the causative agents of disease in man and animals, or are the vectors, or intermediate hosts, of disease-producing organisms. Laboratory fee, \$2.

APICULTURE

Advanced and graduate students taking courses 122 and 124, and specializing in apiculture, are permitted to use the honeybee as illustrative material in the laboratory work of these courses.

61. **General Beekeeping.** Second term. Credit three hours. Lectures, T Th 11. Comstock 17. Practical exercises, W 1.40-4. Comstock 17. Professor PHILLIPS.

This course is intended to afford a general knowledge of the fundamentals of beekeeping, including the life history, instincts, and general behavior of bees, their products, the sources of honey, the rôle of bees in cross-pollination, the equipment of the apiary, wintering problems, the diseases of bees, and the rearing of queens. Laboratory fee, \$2.50.

261. **Advanced Beekeeping.** First and second terms. Credit four hours a term. Open only to qualified seniors and graduate students. M F 11-12.50. Comstock 17. Professor PHILLIPS.

A technical course covering investigations, especially those of a scientific character, in all phases of apiculture. Special consideration is given to the study of beekeeping regions, with particular reference to conditions in New York.

Designed for advanced students preparing to teach or to do research in apiculture.

LIMNOLOGY AND FISHERIES

The courses offered in this division require a certain background in other subjects. Undergraduate students intending to do graduate work in the division should plan their studies from the first year with the following sequence of courses. First year, Zoology 1; second year, Botany 1, Zoology 8 and 16, and Entomology 12; third year, Entomology 132, 171, 173, and 174. Students are also urged to obtain a foundation in Statistics. Zoology 22 is recommended before graduation.

171. **Limnology.** Second term. Credit three hours. Prerequisite, permission to register. Lecture, Th 11. Comstock 145. Laboratory, F 1.40-4, S one period by appointment. Comstock 110. Associate Professor MOTTLEY and Mr. WEBSTER.

An introduction to the study of the relations between aquatic organisms and their environment. A laboratory and field course. Laboratory fee, \$5.

[172. **Advanced Limnology.** First term. Credit three hours. Prerequisite, permission to register. Associate Professor MOTTLEY.] Not given in 1940-41.

A qualitative and quantitative treatment of the problem of the productivity of inland waters. Laboratory fee, \$7.50.

173. **Fisheries Biology.** First term. Credit three or four hours. Prerequisite, permission to register. Lectures, M W F 12. Comstock 145. Laboratory period to be arranged. Associate Professor MOTTLEY.

The lectures deal with the life history of the more important species of food and game fishes in order to provide an understanding of the factors of fish production. Several ocean and freshwater species are studied intensively. Such subjects as spawning, food and feeding habits, enemies and diseases, migration, growth, age determination, methods of capture, and economic value are discussed. The laboratory period is limited to those specializing in wildlife management and deals with the methods of studying life histories as employed by modern fishery investigators. Laboratory fee, \$2.

174. **Fish Culture.** Second term. Credit three hours. Must be preceded by

course 173. Lecture, T 12. Laboratory, T Th 1.40-4. Comstock 110. Associate Professor MOTTLEY and Mr. EMBODY.

A study of the production of fish in hatcheries to meet the specifications of fisheries-management programs. The course includes the problems of hatchery construction and design, the care, handling, and feeding of fish, the treatment of diseases, and the cost of production. The students participate in field and hatchery work. Laboratory fee, \$7.

INSECT PHYSIOLOGY

185a. **Insect Physiology.** First term. Credit three hours. Prerequisite, course 122, Chemistry 102 or 104, and Physics 3 and 4. Lecture, Th 10. Laboratory, T Th 1.40-4. Comstock 265. Doctor PATTON and Mr. METCALF.

An introductory course for upperclassmen and graduate students. The physiology of insect systems is discussed and demonstrated by a series of laboratory exercises. Fee, \$2.50.

185b. **Insect Physiology.** Second term. Credit three hours. Prerequisite, course 125a and permission to register. Lecture, Th 10. Laboratory, T Th 1.40-4. Comstock 265. Doctor PATTON and Mr. METCALF.

An advanced course for students who are interested in physiological research in entomology. The basic principles of physiological methods, equipment design, and manipulation of apparatus are discussed and demonstrated. Laboratory fee, \$5.

RESEARCH

300. **Research.** Throughout the year. Credit and laboratory fees to be arranged. Prerequisite, permission to register from the professor under whom the work is to be taken. Comstock.

300a. **Insect Ecology.** Professor PALM.

300b. **Insect Morphology, Histology and Embryology.** Doctor BUTT.

300c. **Taxonomy.** Professor BRADLEY (all orders), Professor MATHESON (Diptera), and Doctor FORBES (Lepidoptera).

300d. **Economic Entomology.** Professors MATHESON, READIO, and PALM; Assistant Professors LEIBY, COLLINS, SCHWARDT, and HANSBERRY; and Doctors RAWLINS and WATKINS.

300e. **Medical Entomology and Parasitology.** Professor MATHESON.

300f. **Apiculture.** Professor PHILLIPS.

300g. **Limnology and Fisheries.** Associate Professor MOTTLEY.

300h. **Insect Physiology.** Doctor PATTON.

300i. **Insect Toxicology.** Assistant Professors HANSBERRY and NORTON.

SEMINAR

Jugatae. Throughout the year. M 4.30-5.30. Comstock 145.

The work of an entomological seminar is conducted by the Jugatae, an entomological club that meets for a discussion of the results of investigations by its members.

EXTENSION TEACHING

101. **Oral and Written Expression.** First or second term. Credit two hours. Open to juniors and seniors. The number in each section is limited to twenty-four students. Students should consult Professor PEABODY for assignment to sections. Lectures and practice: first term, M F 11, W F 10, or T Th 11, Roberts 131, M W 9, T Th 9, T Th 10, Roberts 492; second term, M W 9, T Th 9, Roberts 492; T Th 11, Roberts 131. Criticism, by appointment, daily, 8-4, S 8-1. Professors EVERETT and PEABODY and Messrs. PHILLIPS, GOODRICH, and MARTIN.

Practice in oral and written presentation of topics in agriculture, with criticism and individual appointments on the technic of public speech. Designed to encourage interest in public affairs, and through demonstrations and the use of graphic material and other forms, to train for effective self-expression in public. Special training is given to competitors for the Eastman Prizes for Public Speaking and in the Rice Debate contest. (See page 79.)

102. Oral and Written Expression. Second term. Credit two hours. Prerequisite, course 101, of which course 102 is a continuation. A part of the work of course 102 consists of a study of parliamentary practice. Lectures and practice, W F 10, T Th 9, or T Th 10. Roberts 131. Criticism, by appointment, daily 8-4, S 8-1. Professor PEABODY and Messrs. PHILLIPS, GOODRICH, and MARTIN.

103. Extension Organization, Administration, and Policy. Second term. Credit three hours. Open to graduate students and seniors, and to juniors by special arrangement. Lectures and exercises based on field work. M W F 10. Roberts 492. A limited number of practice periods on program building may be required outside of the regular class periods. Professors SIMONS, KELSEY, W. J. WRIGHT, FLANSBURGH, EDDY, and R. G. SMITH, and other members of the Extension Staff.

This course is designed to familiarize students with the organization, administration, and policies of extension work as exemplified in New York State. The course is for students preparing for effective service as citizens in rural communities, as well as for prospective county agricultural agents, county 4-H Club agents, home-demonstration agents, or other extension workers in agriculture and home economics.

104. Advanced Oral Expression. Second term. Credit two hours. Prerequisite, courses 101 and 102. Limited to nine students. M W 12. Roberts 492. Professor PEABODY.

An advanced course of study and practice in oral expression as directly related to the needs of the county agent, the home demonstration agent, the junior club leader, and the extension specialist. Part of the work consists in a study of and practice in radio speaking.

110. Agricultural Radio Broadcasting. Second term. Credit two hours. Prerequisite, course 101, or its equivalent, and an average grade of at least 80 in English. Lecture, W 10. Practice, Th 2-4. WESG Studio. Professor TAYLOR and Mr. PHILLIPS.

A course to familiarize students with the best methods of presenting ideas by radio and with radio-studio procedure. Practice includes auditions and criticisms for all members of the class in preparing and presenting radio talks; continuity writing and program arrangement. Participation in broadcast programs from the University station is required. Fee for materials furnished, \$1.

15. Agricultural Journalism. First term. Credit three hours. Open only to those who have passed the required hours in English with an average grade of 80 or better. T Th S 10. Roberts 392. Professor ADAMS.

This course gives the principles of news writing as applied to agricultural and home-economics subjects.

117. Agricultural News Writing. First and second terms. Credit two hours a term. Prerequisite, course 15. Th 2-4. Roberts 492. Professor ADAMS.

This course deals with practical news writing for publication. It includes criticisms, discussions, and consultations on published material written by students in the course.

119. The Country Newspaper. First term. Credit two hours. Prerequisite, course 15. M W 10. Roberts 492. Professor ADAMS.

A study of the community newspaper, its problems, its make-up, and its place as an influence in rural life.

120. Agricultural Information. Second term. Credit two hours. Prerequisite, course 15. T Th 11. Roberts 392. Professor ADAMS.

Publicity and advertising in agricultural extension.

122. Special Feature Articles. Second term. Credit two hours. Prerequisite, course 15. M W 11. Roberts 492. Professor ADAMS.

FARM PRACTICE

The farm-practice requirement is forty points, all of which must be obtained by actual farm work. (See page 19.)

The Office of Farm Practice will assist students in getting work on farms during vacations and at other times, and will supervise and keep records of the work.

Students should consult the office in regard to work on farms.

The office will also be glad to assist those students who have completed the farm-practice requirement, in obtaining places on farms where they can gain wider experience.

1. Farm Practice. First and second terms. Without credit toward graduation, but giving credit toward the farm-practice requirement, depending on the amount and the quality of the work done. Hour and place, by appointment. Professor KING and assistants.

A course designed to assist those students who enter with little or no farm experience. Students will have an opportunity to hitch, harness, and drive horses and to familiarize themselves with the use of the common farm tools. Admission to this course will be determined by the results of the farm-practice tests. This course should be taken by all new students who have had limited farm experience.

FLORICULTURE AND ORNAMENTAL HORTICULTURE

Instruction in the Department of Floriculture and Ornamental Horticulture is planned for the following students: (1) those intending to make commercial plant production, distribution, or utilization their life work, including the management of greenhouses, wholesale and retail establishments; (2) those interested in developing a landscape service, which includes the planning, construction, and planting of small properties (these students are expected to register for two summer sessions); (3) those wishing to become superintendents of parks, golf courses, or private estates; (4) those wishing general information on home gardening.

Students wishing to specialize in the department should plan their course of study with members of the faculty. One semester or its equivalent must be devoted to practice in the chosen field. Courses 1 and 2 are required of all students majoring in the department.

GENERAL COURSES

1. General Floriculture and Ornamental Horticulture. First term. Credit three hours. Lectures, M W 10. Plant Science 37. Laboratory, T or Th 1.40-4. Plant Science 15. Associate Professor POST and Doctor ALLEN.

A general course covering the principles and practices of growing ornamental plants in the garden, greenhouse, and home. Laboratory fee, \$4; deposit, \$2.

2. Introduction to Landscape Design. Second term. Credit three hours. Lecture, M W F 9. Plant Science 233. Acting Professor PORTER.

A consideration of the principles of landscape design as applied to the small-residence property.

5. Flower Arrangement. Second term. Credit one hour. Laboratory, T W Th or F 1.40-4. Plant Science 22. Miss SMITH.

A study of the principles and methods of arranging flowers and plant materials for decorative use. Laboratory fee, \$8.

PLANT MATERIALS AND PROPAGATION

11. Plant Propagation. First term. Credit three hours. Prerequisite, course 1, Botany 1, or permission to register. Lectures, T Th 11. Laboratory, S 8-10.30 or 10.30-12.50. Plant Science 37, greenhouses, and nurseries. Mr. SKINNER.

A study of the principles and methods involved in the propagation of woody and herbaceous plants by seeds, division, layers, cuttings, budding, and grafting. All members of the class are required to participate in a fall excursion to several near-by nurseries. Laboratory and transportation fee, \$5.

12. Herbaceous Plant Materials. Second and first term. Credit: second term, two hours; first term, one hour. Prerequisite, course 1 or permission to register. Lecture, second term, T 8. Plant Science 37. Laboratory: second term, T or Th 1.40-4. Plant Science 15; first term, W 10-12 or F 11-1. Plant Science 15. Doctor ALLEN and Mr. WHEELER.

A study of the ornamental herbaceous plants used in landscape and garden plantings. Emphasis is placed on the identification, use, and culture of garden flowers. All members of the class are required to participate in an excursion to Rochester parks and gardens in late May. Laboratory and transportation fee: second term, \$7; first term, \$5.

13. Woody-Plant Materials. First and second terms. Summer school is required for students specializing in landscape service. Credit two to four hours a term. Prerequisite, course 1 or permission to register. Lectures, T Th 9. Plant Science 29. Laboratory and field trips, M and W or F 1.40-4. Plant Science 29. Professor R. W. CURTIS and Doctor PRIDHAM.

A study of the trees, shrubs, and vines used in landscape planting and in nursery work. All members of the class are required to participate in a spring and a fall excursion to Rochester parks and gardens. Laboratory and transportation fee, \$7 a term.

114. Lawn-Making and Green-Keeping. Second term. Credit two hours. Prerequisite, course 13, Agronomy 1, and permission to register. S 8-1. Plant Science 29. Professor R. W. CURTIS and Doctor PRIDHAM.

This course deals with the principles, practices, and materials for the construction and maintenance of lawns and greens. A term report is assigned to each student. An inspection trip is taken during the spring recess to golf courses in Philadelphia and the National Turf Garden in Washington. Laboratory fee, \$5; transportation fee, \$15.

COMMERCIAL FLORICULTURE AND ORNAMENTAL HORTICULTURE

123. Commercial Greenhouse Production. First and second terms. Credit four hours a term. Prerequisite, courses 1 and 11, Botany 31, Agronomy 1, and the practice requirement. Lectures and recitations, M W F 9. Plant Science 37. Laboratory, W 1.40-4. Greenhouses. Associate Professor POST and Mr. WEDDLE.

The first term consists of a comprehensive study of the application of basic science to the culture of ornamental plants. The second term is devoted to a study of the commercial production of florist crops. The class is required to participate in a spring trip to near-by greenhouses and a fall trip to Rome and Utica the first week in December. Laboratory and transportation fee, \$7 a term.

125. Flower-Store Management. Second term. Credit two hours. Prerequisite, course 5 and permission to register. Lecture, M 11. Laboratory, M 1.40-4. Plant Science 22. Mr. WEDDLE.

Flower-shop management, business methods, and the making of floral designs are studied. Laboratory fee, \$10; deposit, \$2.

126. Commercial Plant Propagation. Second and first term. Credit two hours a term. Prerequisite, course 11 and Chemistry 102 or 104; to be accompanied or preceded by Plant Physiology 31. Lectures and laboratory, M W 11-12.50. Plant Science 40, greenhouses, and nurseries. Assistant Professor HUNN and Mr. SKINNER.

A study of equipment and methods in commercial propagation and the care of plant stocks in the lining-out nursery. Students are required to participate in trips to several nurseries during the year. Laboratory fee, \$5 a term.

127. Principles and Methods of Nursery Practice. First and second terms. Credit two hours a term. Prerequisite, permission to register. Lectures and laboratory, T Th 1.40-4. Plant Science 40. Assistant Professor HUNN.

Nursery organization, the culture of plants in the nursery, merchandising methods, and the relationship of the nursery to the landscape contractor are studied. Trips are taken to several nurseries and related enterprises throughout the State. Laboratory fee, \$1.50 a term.

129. Tree and Shrub Management. Second term. Credit three hours. Prerequisite, permission to register. Lectures, T Th 11. Laboratory, W 1.40-4. Plant Science 40 and nurseries. Assistant Professor HUNN and members of the staff.

A study of the principles and practices employed in the management of trees and shrubs including transplanting, fertilizing, pruning, spraying, and big-tree moving. Studies of planting specifications and cost estimates are included. Laboratory fee, \$2.50.

LANDSCAPE SERVICE

132. Landscape Planning and Planting of Small Properties. First term. Credit seven hours. Intended for advanced students; not open to general election. Prerequisite, courses 1, 2, 12, 13, and Drawing 1 and 11. Lectures, T Th 10. Plant Science 141. Laboratory, T W 1.40-4, M F S 10-12.50. Plant Science 433. Acting Professor PORTER and Mr. REICH.

A study of the arrangement and planting of small properties. Laboratory fee, \$5.

133. Landscape Planning and Planting of Small Properties. Second term. Credit nine hours. Prerequisite, course 132, Drawing 15, and Agricultural Engineering 121. Lecture, Th 9. Plant Science 143. Laboratories, W 9-12, M Th F 10-1, T W F 1.40-4.30, and three three-hour periods. Plant Science 433. Acting Professor PORTER and Mr. REICH.

A continuation of course 113. Laboratory fee, \$5.

134. The Construction and Planting of Small Gardens. First term. Credit three hours. Intended for advanced students specializing in landscape service. Prerequisite, courses 5 and 132. Lecture, Th 9. Plant Science 143. Laboratory, Th 10-12.50 and 1.40-4. Plant Science 433. Acting Professor PORTER.

A study of the design, construction, and planting of intimate garden areas, with special attention to plant and flower combinations. Laboratory fee, \$3.

SPECIAL PROBLEMS

140. Literature and Special Problems. First or second term. Credit one to four hours. Designed for advanced students. Prerequisite, permission to register after consultation with staff members. Doctor PRIDHAM.

Includes a one-hour lecture course covering the organization of literature and history as applied to special problems in floriculture and ornamental horticulture. Lecture, T 4.15. Laboratory fee, to be arranged.

241. Seminar. First term. Required of all graduate students in the department. M 4.15. Plant Science 37.

FORESTRY

Instruction in forestry is designed to meet the needs of the following: (1) students of general agriculture who wish elementary instruction in the care of woodlands and in forest planting and forest nursery work; (2) students interested in wild-life conservation and management or in forest ecology; (3) students preparing for the fields of agricultural extension or vocational agricultural teaching; and (4) others who desire an understanding of the field of forestry in relation to public and private welfare. Instruction in professional forestry is not offered at Cornell.

1. Farm Woodlands. First term. Credit three hours. Lectures, W F 11. Fernow 122. Practice, M 1.40-4. Fernow 206. Professor RECKNAGEL.

A course covering those phases of forestry that are applicable to the farm woods. Identification of the principal trees of this region; measurement of logs, trees, and stands; nursery work, forest planting, thinning, and improvement cuttings; the preservative treatment of farm timbers. Laboratory fee, \$1.

2. Utilization of Farm Woodland Products. Second term. Credit two hours. Lectures, T Th 9. Fernow 122. Professor RECKNAGEL.

The principal products derived from farm woodland, such as logs, pulpwood, firewood, fence posts, and so on, their harvesting and marketing, and the application of forest utilization practice to the farm woods. Identification of the wood

of common trees, its properties and uses. Laboratory fee, \$2 to cover the cost of two or three required field trips after the spring recess.

3. Conservation of Natural Resources. Second term. Credit two hours. Prerequisite, Economics 1. Lectures, T Th 10. Fernow 122. Professor ADAMS.

The conservation of natural resources in the United States; the interrelation of the uses and wastes of the forest with those of various resources; the influence of the physical equipment of America on human life and on American civilization, with special reference to natural resources, as the basis of national strength.

4. The Field of Forestry. First term. Credit two hours. Lectures, M W 10. Fernow 122. Professor HOSMER.

The place of forestry in the life of a nation; its nature, aims, and economic importance; the five main branches of forestry; national, state, communal, and private forestry, including a discussion of forest taxation.

23. Establishment and Development of Farm Woodlands. Second term. Credit three hours. Lectures, M W 9. Fernow 122. Laboratory, T 1.40-4. Fernow 206. Professor RECKNAGEL.

Distribution and importance of the principal timber trees and forest types of the United States; life history of the forest; silvicultural handling of woodlands including natural reproduction of forests; forest planting, seeding, and nursery work; care of the forest during its development, thinnings, and other intermediate cuttings; protection from fire and other enemies. Laboratory fee, \$1.

54. Mensuration and Management of Farm Woodlands. First term. Credit three hours. Lectures, T Th 9. Fernow 206. Laboratory, F 1.40-4. Fernow 206. Professor RECKNAGEL.

Instruments used in forestry; measurement of logs, trees, and stands of timber; volume increment; value determination; methods of determining cutting budgets; woodland-management plans. Laboratory fee, \$1.

166. Wild-Life Conservation in Relation to Forestry. First term. Credit two hours. Prerequisite, Wild-Life Conservation and Game Management 2. Lectures, T Th 10. Fernow 122. Professor HOSMER.

A consideration of the place of wild-life conservation and management in the multiple-purpose programs which govern the full and rounded use of national, state, and private forests.

291. Seminar. First and second terms. Without credit. Hours to be arranged. Professors HOSMER and RECKNAGEL and Assistant Professor WALLIHAN.

Field and classroom conferences.

METEOROLOGY

1. Elementary Meteorology. First or second term. Credit three hours. Lectures, T Th 11. Plant Science 143. Laboratory, M T W Th or F 1.40-4. Plant Science 114. Professor MORDOFF and Mr. GRAVES.

A course designed to acquaint the student with the principles of the general and secondary circulation of the atmosphere; the elements of weather and climate; practical weather forecasting from weather maps and local observations. Laboratory fee, \$2.

2. General Climatology. First term. Credit two hours. Prerequisite, course 1. Lectures and recitations, M W 9. Plant Science 114. One conference period a week, by appointment. Professor MORDOFF.

A course designed to give a general knowledge of climatology and of the various climates of the United States, with emphasis on those of New York State.

6. Meteorology and Climatology. Second term. Credit two hours. M W 11. Plant Science 143. Registration limited to graduate students and to seniors who have not had course 1. Students must consult the department before registering for the course. Professor MORDOFF.

A brief course covering only the more essential phases of meteorology and climatology, and their relations to agriculture.

211. Research. First or second term. Credit one or more hours a term. Prerequisite, permission to register. Hours by appointment. Professor MORDOFF.

A course designed for advanced and graduate students. Original investigations in meteorology and climatology.

212. Seminar. First term. Credit two hours. Prerequisite, course 2 and permission to register. Hours to be arranged. Plant Science 114. Professor MORDOFF.

Preparation and reading of reports on special topics; abstracts and discussions of papers dealing with the current literature of meteorology and climatology. A specific problem is required of each student.

PLANT BREEDING

101. Genetics. First term. Credit four hours. Prerequisite, a beginning biological science and a course in physiology. Courses in cytology and in taxonomic botany and zoology will be found helpful. Not open to sophomores. Lectures, M W F 8. Plant Science 233. One conference period, to be arranged. Laboratory, M T W or F 1.40-4. Plant Science 146. Professor FRASER, Doctor DORSEY, and Mr. JARVIS.

A course designed to acquaint the student with the fundamental principles of heredity and variation in plants and animals.

Laboratory studies of hybrid material in plants and breeding experiments with the vinegar fly, *Drosophila*. Laboratory fee, \$3; deposit, \$2.

201. Genetics, Advanced Course. Second term. Credit three hours. Seniors admitted by special permission. Discussions, M F 8-10, and laboratory work to be arranged. Plant Science 146. Professor FRASER and Mr. JARVIS.

Laboratory fee \$3; deposit \$2.

103. Plant Breeding. First term. Credit three hours. (Students who have had course 101 will be allowed two-hours credit.) Prerequisite, Botany 1, 31, and a general course in at least one of the following: farm crops, vegetable crops, floriculture, or pomology. Lectures, T Th 8. Plant Science 141. Lecture and practice, S 8-10. Plant Science 22. Professor C. H. MYERS.

A general study of the principles and practices of plant breeding, hybridization, selection, seed production and distribution in relation to crop improvement; development of methods for different types of plants; lectures supplemented by periods in the greenhouse and experimental fields.

150. Special Problems in Plant Breeding and Genetics. First or second term. Credit one or two hours. Open to properly qualified seniors. Prerequisite, Plant Breeding 101 or 103 and permission to register. Members of the Plant Breeding staff.

211. Statistical Methods of Analysis. First term. Credit two hours. For graduate students. Seniors admitted by special permission. Th 1.40-4. Plant Science 233. Associate Professor LIVERMORE.

A discussion of statistical methods for the study of variation, correlation, curve fitting, experimental error, the analysis of variance and of covariance; and the application of these methods to problems in biology and related fields. Laboratory fee, \$2.

222. Seminar. Second term. For graduate students only. W 11. Plant Science. Professors EMERSON, LOVE, MYERS, BUSSELL, FRASER, and WIGGANS, Associate Professor LIVERMORE, and Doctor DORSEY.

PLANT PATHOLOGY

1. Elementary Plant Pathology. First or second term. The course number 1a should be used by those who register for four-hours credit and 1b by those who register for two-hours credit. Prerequisite, Botany 1 or equivalent Botany. For undergraduates. Registration limited to sixty-six students in the first term and to forty-eight students in the second term. Admission on the basis of average standing to date; students with an average below 75 may register for two hours only. Lecture, W 8. Plant Science 37. Practice and conference, any two periods, T W

Th F 1.40-4. Plant Science 336, 341, 343, and 362. Professor WHETZEL, Associate Professor WELCH, Assistant Professor TYLER, and Messrs. SPROSTON, H. F. FITZPATRICK, NIEDERHAUSER, and _____.

1a. Credit four hours. A minimum of fifteen exercises with a personal conference on each. Prerequisite for course 2.

1b. Credit two hours. A minimum of twelve exercises with two or three conferences during the term. Not accepted as a prerequisite for courses in Plant Pathology except for course 111.

An elementary course introducing the student to the nature, cause, and control of plant diseases. Illustrated by studies of the commoner diseases of cultivated plants. Laboratory fee, \$4.50; breakage deposit, \$5.

200. **General Plant Pathology.** First term. Credit four hours. Prerequisite, permission to register. For graduate students with their major or a minor in plant pathology. Open also to qualified graduate students in other fields. Lecture, T 11, Plant Science 336. Practice, three three-hour periods weekly at the students' convenience. Professor WHETZEL, Associate Professor WELCH, and Assistant Professor TYLER.

This course is designed to give the entering graduate student an introduction to the basic features and technics of the science of phytopathology and to provide an adequate foundation for successful prosecution of research in this field. Laboratory fee, \$4.50; breakage deposit, \$5.

201. **Advanced Plant Pathology.** First and second terms. Credit three hours. Prerequisite, courses 200 and 2 and permission to register. Designed for students specializing in plant pathology. Lecture T 9. Plant Science 336. Practice, T Th 10-12.30. Plant Science 304. Professor MASSEY and Mr. COCHRANE.

A presentation and analysis of the experimental and empirical knowledge of plant diseases. The phenomena of inoculation, infection, susceptibility, and susceptible reactions are critically considered. Laboratory fee, \$4.50; breakage deposit, \$3.

2. **Principles of Plant-Disease Control.** First term, graduates; second term, undergraduates. Credit three hours. Prerequisite, course 200 or 1a. Lecture, Th 8. Plant Science 336. Practice, M Th 1.40-4. Plant Science 342. Professor WHETZEL and Assistant Professor TYLER.

A consideration of the principles and methods of controlling plant diseases. This includes studies on: exclusion by laws, regulations, quarantine, inspection, and disinfection; eradication by pruning, seed selection, tree surgery, rotation, disinfection, and other means; protection by spraying, dusting, wound dressing and the like; immunization by selection, breeding, and feeding. Number taking the course limited to twenty-four. Admission, if registration is in excess of this number, on the basis of average scholastic standing to date. Laboratory fee, \$4.50; breakage deposit, \$5.

111. **Diseases of Trees and Shrubs.** Second term. Credit three hours. Prerequisite, course 1a or 1b. Lecture, F 10. Plant Science 336. Practice, T Th 1.40-4. Plant Science 362. Associate Professor WELCH and Mr. _____.

A course dealing with the diseases peculiar to woody plants, their recognition and treatment. Laboratory fee, \$4; breakage deposit, \$3.

[121. **Comparative Morphology of Fungi.** Second term. Credit four hours. Given in alternate years. An equivalent course (A121) is given in the summer school. Prerequisite, Botany 1 or its equivalent, and permission to register. Professor FITZPATRICK and Mr. _____.] Not given in 1940-41.

A synoptical course designed to introduce the beginner to the general field of mycology. Emphasis is placed on morphology and phylogeny, rather than on taxonomy. Laboratory fee, \$6; breakage deposit, \$3.

221. **Mycology.** First and second terms. Credit five hours. Given in alternate years. Prerequisite, Botany 1 or its equivalent, and permission to register. Lectures, M W 11. Plant Science 336. Practice, M W 1.40-4, and one equivalent additional period to be arranged. Plant Science 329. Professor H. M. FITZPATRICK and Mr. _____.

An intensive course designed especially for students specializing in mycology or plant pathology. Emphasis is placed on taxonomy, field work is encouraged, and practice in identification is afforded in various groups. Entire field of mycology covered, with less than a proportionate amount of time given to the higher Basidiomycetes. Laboratory fee, \$6; breakage deposit, \$5.

[222. **Mycology.** First term. Credit five hours. Given in alternate years. Prerequisite, Botany 1 or its equivalent, and permission to register. Need not be preceded by course 221. Professor FITZPATRICK and Mr. ————.] Not given in 1940-41.

An intensive course designed especially for students specializing in mycology or in mycological aspects of plant pathology. A detailed treatment of the Basidiomycetes. Supplements course 221 to provide a coherent three-term treatment of the fungi. Laboratory fee, \$6; breakage deposit, \$5.

231. **History of Plant Pathology.** First and second terms. Credit one hour. Prerequisite, course 1 and a reading knowledge of French and German. Professor WHETZEL.

241. **Undergraduate Research.** First or second term, or both. Credit three hours or more. Registration by permission. Not less than three laboratory periods of three clock hours each week. Professors and assistant professors of the departmental staff.

This course is designed to afford opportunity for selected undergraduates to test their inclination and ability to do research work. The student is expected to prosecute with interest and enthusiasm, under informal direction of the professor, some problem or problems mutually agreed upon. Laboratory fee, \$1.50 a credit hour; breakage deposit, \$3.

242. **Seminar.** First and second terms. Required of graduate students taking work in the department. T 4.30-6. Plant Science Seminar Room.

243. **Literature Review.** Optional. Biweekly. Time to be arranged.

POMOLOGY

Students desiring to do their major work in pomology may obtain a suggested sequence of courses for the four-year period by consulting the Department.

1. **General Pomology.** First or second term. Credit three hours. Lectures, T Th 8. Plant Science 233. Laboratory: first term, W Th or F 1.40-4; second term, M T W Th or F 1.40-4. Plant Science 107. Assistant Professor SMOCK and Messrs. EDGERTON and HOUGH.

A study of the general principles and practices in pomology; propagation and care of orchard trees and small fruits; harvesting, storing, and marketing fruit; practical work in budding, grafting, pruning, and planting; study of varieties, growth, and fruiting habits. Laboratory fee, \$1.50.

2. **Fruit Varieties.** First term. Credit two hours. Prerequisite, course 1. Lecture, T8. Laboratory, T 9 Th 8-10 or T 1.40-4. Plant Science 107. Professor MACDANIELS and Mr. HOUGH.

A study of the most important varieties of apples, pears, peaches, plums, grapes, and small fruits from the standpoint of their identification, growth characters, regional adaptation, season of ripening, storage quality, and other matters of a similar nature. A part of the time is given to the judging of exhibition fruit, and the Farm and Home Week fruit exhibit is set up by the students in this course. Laboratory fee, \$1.50.

111. **Packing and Storage of Fruit for Market.** First term. Credit two hours. Prerequisite, courses 1 and 2. Lecture, S 8. Laboratory, S 9-11.30 or M 1.40-4. Plant Science 107 and the packing house. Assistant Professor SMOCK and Mr. VAN DOREN.

The important factors in harvesting and handling fruit that affect quality and marketability are studied. Particular emphasis is placed on the practices and problems of handling apples, but the work covers also such fruits as peaches, pears, and grapes, in so far as these are available. The effect of grades and packages on distribution and marketing is fully discussed, and consideration is given to

some of the problems of market inspection. The principles and practices of common, cold, and freezing storage are considered. Laboratory fee, \$1.50.

112. Advanced Laboratory Course. Second term. Credit two hours. Intended for students doing their major work in pomology. S 8-1. Plant Science 107. Professors HEINICKE and MACDANIELS.

This course is designed to give more extended practice in the various orchard operations than can be given in course 1. Special attention is given to problems of pruning, tree surgery, bracing, orchard-soil selection and management, and spray practice.

[121. Economic Fruits of the World. First term. Credit three hours. Given in alternate years. Prerequisite, course 1. Professor MACDANIELS.] Not given in 1940-41.

A study of all species of fruit-bearing plants of economic importance, such as the date, the banana, the citrus fruits, the nut-bearing trees, and the newly introduced fruits, with special reference to their cultural requirements in the United States and its insular possessions. All fruits not considered in other courses are considered here. The course is designed to give a broad view of world pomology and its relationship with the fruit industry of New York State. Laboratory fee, \$1.50.

131. Advanced Pomology. Second term. Credit three hours. Given in alternate years. Prerequisite, courses 1 and 2, and Botany 31. Lectures, M W F 8. Plant Science 141. Professor HEINICKE.

A comprehensive study of the sources of knowledge and opinion as to practices in pomology; experiences of the industry and research in pomology are discussed with special reference to their application in the solution of practical problems in fruit growing.

[231. Special Topics in Experimental Pomology. Second term. Credit three hours. Given in alternate years. Open to qualified seniors and to graduate students. Professor HEINICKE.] Not given in 1940-41.

In this course the student is expected to review critically and evaluate the more important original papers relating to various phases of pomological research. Interpretation of the literature is made on the basis of the fundamental principles of plant biology. Recent experimental methods applicable to the field of pomology are fully considered.

243. The Functional Morphology and Anatomy of Fruit Plants and Their Products. First term. Credit three hours. Given in alternate years. Prerequisite, adequate preparation in botany and permission to register. Primarily for graduate students. Lectures, T Th 12. Laboratory, F 1.40-4. Plant Science 114. Professor MACDANIELS.

The morphology of the flowers and fruits and the anatomy of these and other plant parts, particularly as related to physiological function are considered. Emphasis is given the species important in temperate zone horticulture. The course supplements rather than replaces basis courses in general morphology and anatomy. Laboratory fee, \$1.50.

200. Seminar. Throughout the year, without credit. Required of students taking course 201 and of graduate students in pomology. M 11. Plant Science 404. Members of the departmental staff.

201. Research. First, second, or both terms. Credit two or more hours a term. Prerequisite, course 131. Professors HEINICKE, MACDANIELS, and HOFFMAN and Assistant Professors SMOCK and BOYNTON.

POULTRY HUSBANDRY

Course 1 is a prerequisite for all other courses. Specially qualified students may have this prerequisite waived for some courses by permission of the instructors concerned.

1. Farm Poultry. First term. Credit three hours. Lectures, M W F 10. Rice 300. One recitation period, to be arranged. Rice 305. Associate Professor HALL, assisted by other members of the staff.

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

110. Poultry Nutrition. Second term. Credit three hours. Not open to freshmen. Lectures, T Th 9. Laboratory, T or W 1.40-4. Rice 305. Professor HEUSER.

The principles of poultry nutrition and their application to poultry-feeding management.

210. Experimental Methods in Poultry Nutrition. First term. Credit two hours. For graduate students. Not given every year and not unless five or more students apply for the course. Registration by appointment. Discussion and laboratory period, W 1.40-5. Rice. Professor NORRIS.

A critical consideration of the domestic fowl as an experimental animal and of the experimental methods used in conducting research in poultry nutrition. Laboratory fee, \$5.

219. Seminar in Animal Nutrition. First and second terms. Open to graduate students only. Registration by permission. Assigned readings on selected topics, with weekly conferences. M 4.15. Professors MAYNARD, McCAY, and NORRIS.

A consideration of the experimental data on which the principles of animal nutrition are based, and a critical review of current literature.

20. Poultry Breeds, Breeding and Judging. First term. Credit three hours. Prerequisite, course 1. Lecture or recitation, M W 11. Rice 100. Laboratory, M or T 1.40-4. Judging Laboratory. Associate Professor HALL.

Selecting and judging birds for production and breed characters; origin, history, and classification of breeds; introduction to breeding. A one-day trip is made to one of the leading poultry shows. Estimated cost for transportation, \$5. Laboratory fee, \$2.

[120. Poultry Genetics. Second term. Credit two hours. Given in alternate years. Prerequisite, Zoology 1, Plant Breeding 101, and permission of the instructor. Open to graduate students, juniors, and seniors. Professor HUTT.] Not given in 1940-41.

A survey of inherited characters in domestic birds, cytology, linkage, inbreeding, hybrid vigor, resistance to disease, and the application of genetic principles to poultry breeding.

[121. Physiology of Avian Reproduction. Second term. Credit two hours. Given in alternate years. Prerequisites, Zoology 1, a course in animal physiology, and permission of the instructor. Open to graduate students, juniors, and seniors. Assistant Professor LAMOREUX.] Not given in 1940-41.

Gross and microscopic anatomy of the reproductive organs of birds and their functions, with special reference to the fowl. Gametogenesis, fertilization, infertility and embryonic mortality, sex differentiation, and the functions of the endocrine glands.

[220. Animal Genetics. First term. For graduate students. Prerequisite, Plant Breeding 101 and permission of the instructor. Professor HUTT.] Not given in 1940-41.

Assigned readings and conferences on inbreeding; hybridization; disease resistance; lethal genes; genetic sterility; sex; heredity in laboratory animals, domestic animals, and man; sire indices, and other topics. Designed to acquaint the student with the literature and methods of research in animal genetics.

229. Seminar in Animal Breeding. Throughout the year. T 4.15. Rice 201. Professors HUTT and ASDELL.

Discussion of current literature and special topics of interest to workers in this field.

30. Incubation and Brooding. Second term. Credit three hours. Prerequisite, course 1. Lectures, W F 10. Laboratory, Th F 1.40-4, or S 8-10.30. Rice 100. Assistant Professor BRUCKNER.

Principles and practice of incubation and brooding of domestic and game birds; problems of hatchery management.

50. Market Eggs and Poultry. Second term. Credit two hours. Prerequisite,

course 1. Lecture, M 10. Laboratory, M T W or Th 1.40-4. Rice 100. Associate Professor HALL.

A detailed study of the interior and exterior qualities of eggs, abnormalities, egg grades, and standards; practice in candling, grading, and packing. Grades and standards of market poultry; killing, dressing, and packing. General market information. A one-day trip is made to Syracuse markets. Estimated cost for transportation, \$1.50. Laboratory fee, \$2.

170. **Poultry Hygiene and Disease.** First term. Credit two hours. Prerequisite, courses 30 and 110, Animal Physiology 10, or Human Physiology 303, and Agricultural Bacteriology 3. Lecture and laboratory, Th 1.40-4. James Law Hall. Doctor LEVINE.

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.

209. **Seminar in Poultry Biology.** Throughout the year. For graduate students. F 4.15. Rice 201. Members of the departmental staff.

A survey of recent literature and research in poultry biology.

RURAL EDUCATION

Courses are grouped by decades: Introductory, 1-9; Psychology and Educational Psychology, 10-20; Method, 21-40; Preparation of Teachers for Normal Schools and Colleges, 41-50; Measurement and Statistics, 51-60; Administration and Supervision, 61-80; Educational Theory, 81-99. See page 26 for a further statement regarding the numbering of courses.

FOUR-YEAR PROGRAM FOR THE PREPARATION OF SECONDARY SCHOOL TEACHERS

The student who entered the University prior to the fall of 1939 may prepare for secondary-school teaching through a four-year program. The required professional courses are as follows:

Educational Psychology.....	3 hours
Course 111 or 112	
Principles of Education.....	3 hours
Course 181	
Methods, observation, teaching and extra-instructional problems.	9 hours
These are integrated units of work which may be met, for the various groups of teachers, through the following courses:	
Teachers of Agriculture, courses 131, 132, 133.	
Teachers of Homemaking, courses 135, 136, 137.	
Teachers of Biological Science, courses 121, 126, 137, 4d.	
Elective.....	3 hours

Teachers of Homemaking are required to take course 117 (Psychology of Childhood and Adolescence). Other teachers may choose a three-hour course in Education or Educational Psychology subject to the approval of their advisers.

Observation and practice teaching facilities are provided through cooperation with Ithaca and near-by communities.

FIVE-YEAR PROGRAM FOR THE PREPARATION OF SECONDARY SCHOOL TEACHERS

Students who enter the University with the intention of preparing for secondary-school teaching are expected to complete a five-year program. This arrangement is effective beginning with the class that entered during 1939-40. The student registers in one of the undergraduate colleges and at the end of four years he will normally receive a bachelor's degree. Upon the satisfactory completion of the five-year program, a professional degree, Master of Education, will be awarded. A special bulletin dealing with this program may be obtained from the Graduate School of Education.

The attention of students is directed to the announcement of the Graduate School of Education.

PSYCHOLOGY AND EDUCATIONAL PSYCHOLOGY

Students other than those preparing to teach vocational agriculture or vocational home economics, who wish course 112, should register for Section 2 at 9 o'clock, first term. Admission of such students to any other section is rigidly limited.

110. Psychology: An Introductory Course. First or second term. Credit three hours. Not open to freshmen. M W F 10. Goldwin Smith C. Professor WINSOR. Fee, \$1.

111. Psychology for Students of Education. First term. Credit three hours. Primarily for prospective teachers of vocational agriculture. Open to juniors and seniors. M W F 10. Caldwell 143. Assistant Professor BAYNE. Fee, \$1.

112. Psychology for Students of Education. First or second term. Credit three hours. Prerequisite, course 110, Psychology 1, or the equivalent. Open to second-term sophomores, juniors, and seniors. Section 1, first term, and sections 1 and 3, second term, are primarily for prospective teachers of vocational agriculture and vocational home economics. First term: M W F 9. Section 1, Warren 125; Section 2, Comstock 145. Second term: Section 1, M W F 9, Warren 125; Section 2, M W F 9, Comstock 245; Section 3, M W F 10, Warren 225. Professor KRUSE, Assistant Professor BAYNE, and Doctor GARDNER. Fee, \$1.

117. Psychology of Childhood and Adolescence. First or second term. Credit three hours. Open only to students who have had course 111 or 112, or the equivalent. M W F 10. Roberts 392. Professor KRUSE and Doctor GARDNER.

211a. Psychology for Students of Education. First term. Credit three hours. For mature students with teaching experience. Lectures, M F 11-12.20. Stone 309. Professor KRUSE.

212. Psychology of Learning. Second term. Credit two hours. Th 4.15-6. Stone 309. Professor KRUSE.

[213. Psychology of Learning in the School Subjects. First term. Credit two hours. Prerequisite, a course in educational psychology and permission of the instructor to register. Primarily for graduate students. Assistant Professor BAYNE.] Not given in 1940-41.

[218. Seminar in Educational Psychology. Second term. Credit two hours. Professor KRUSE.] Not given in 1940-41.

METHOD

121. Method and Procedure in Secondary School Teaching. First term. Credit three hours. Prerequisite, course 111, 112, or the equivalent. Open to juniors and seniors. Lectures, M W F 11. Plant Science 141. Professor FERRISS.

The development of certain principles of teaching in secondary schools, and their applications to practical problems of teaching, such as objectives, selecting and organizing teaching materials, making the assignment, directing study, and so forth.

126. The Teaching of Science in the Secondary School. First or second term. Credit two hours. Open to seniors and graduates on the approval of the instructor. Th 4.15-5.45. Fernow 14. Assistant Professor JOHNSON.

Special methods for teaching science and the organization of science materials in the secondary school. This course is correlated with student teaching in science.

[127. Observational Aids in Teaching. Second term. Credit two hours. Assistant Professor JOHNSON.] Not given in 1940-41.

A course dealing with methods for collecting, preparing, and evaluating materials available as visual or other aids, together with a study of technics for using such aids effectively. Special emphasis is given to subjects commonly taught in

elementary and secondary schools. Students are also assisted in applying the methods and technics to special fields.

[129. **Teaching Adaptations for the Atypical Child.** Second term. Credit three hours. Prerequisite, course 111, 112, or the equivalent. Doctor GARDNER.] Not given in 1940-41.

31. **Planning for the Teaching of Agriculture.** First or second term. Credit one hour. Open to sophomores who are planning to teach agriculture in the public schools. First term: Th 10, Warren 101. Second term: Th 9, Warren 140. Assistant Professor W. A. SMITH.

Consideration of the problems leading to the choice of agricultural education as a field of preparation.

131. **Introduction to Teaching in Vocational Agriculture.** First or second term. Credit three hours. Must be preceded or accompanied by course 111 or 112 or the equivalent. Open by permission only to students whose practical experience and grades are satisfactory and whose progress in the prescribed courses in technical agriculture is adequate. Lectures, T Th 11. First term, Warren 101; second term, Plant Science 37. Laboratory, each term, M 1.40-4. Plant Science 37. Assistant Professor W. A. SMITH.

Consideration of the organization of programs of instruction in vocational agriculture and of the problems involved in conducting a program. Observation of teaching in typical departments; preparation for course 132. Laboratory fee, \$3.

132. **The Teaching of Agriculture in the Secondary School.** Throughout a full year in two sequences, beginning in either term. Credit three hours each term. Open to juniors and seniors who have completed either course 111 or 112 and 131 or equivalents, whose farm experience is adequate, and who have permission to register. Sequence 1, beginning the first term, T Th 9. Sequence 2, beginning the second term, T Th 10. Warren 201. Laboratory to be arranged. Assistant Professors HOSKINS and OLNEY.

A study of the problems of teaching based upon the planning for and participation in teaching. Opportunity is provided for experience in organizing course materials, in equipping departments, and in planning programs for special groups. Laboratory fee, \$5 a term.

133. **Directed Teaching of Students in Agricultural Education.** First or second term. Credit to be arranged. Registration by permission. Assistant Professors HOSKINS and OLNEY.

Fee, \$3 a term.

[134. **Adult Education.** First term. Credit three hours. Professor MOORE.] Not given in 1940-41.

134a. **Special Education for Out-of-School Youths and Adults.** Second term. Credit two hours. For seniors and graduate students in agricultural education; for others by permission. M 4.15-5.45. Stone 309. Assistant Professor HOSKINS.

A consideration of the problems of organization and leadership of out-of-school groups in rural areas.

134b. **Adult Homemaking Education.** (Leadership in Home Economics, Home Economics 310 and 320).

Home Economics 310. First term. Credit three hours. Time to be arranged. Miss HENDERSON.

Home Economics 320. Second term. Credit three hours. Discussions, M F 11-12. Martha Van Rensselaer 343. Miss HENDERSON.

For extension workers, home-economics teachers, and others interested in homemaking education.

135. **The Teaching of Home Economics in the Secondary School.** First or second term. Credit three hours. Prerequisite, course 111, 112, or the equivalent. Required of all students preparing to teach home economics. Lecture, Th 2-4.00. Warren 225. Miss HUTCHINS.

One period daily for observation and participation in the Ithaca Junior High School throughout the semester. Schedules must be approved by the Department of Rural Education.

This course undertakes to interpret present-day educational theories and practices as applied to home economics; to study the activities in which the home economics teacher engages, and the factors which make for successful performance; to induct students into teaching through graded participation in the home arts department of the Ithaca Junior High School. Fee, \$2.

136. Directed Teaching of Home Economics in the Secondary School. First or second term. Credit four hours. Prerequisite, course 135. Open to seniors who have successfully completed prerequisites in Education and have been approved by a committee composed of members of the faculties of Home Economics and Rural Education. General conferences, S 8-10. Stone 309. Professor BINZEL, Miss HASTIE, and Mrs. ROBERTS.

Schedules must provide three entire days a week, or the equivalent, over a period of five weeks for directed teaching. Visits to schools for the purpose of studying furnishings and equipment are a part of the course. Fee, \$10.

137. Extra-Instructional Problems. First or second term. Credit two hours. First term for prospective teachers of home economics only. Second term primarily for prospective teachers of science and home economics. T Th 9. Plant Science 141. Professor MOORE.

This course is designed to deal with problems confronting the teachers in the performance of those duties and the meeting of those responsibilities in the school that extend beyond the classroom and class instruction.

226. Seminar in Science Teaching. Second term. Credit one or two hours. M 4-30. Fernow 8. Assistant Professor JOHNSON.

Special problems in science teaching.

227. Seminar in Elementary Education. Second term. Credit two hours. W 4-6. Stone 309. Professor MOORE.

Topics to be determined by the interests of the members.

228. Seminar in Child Guidance. (Family Life 350) Second term. Credit two hours. For graduate students who have had some work in child guidance. F 4-6. Martha Van Rensselaer G 58. Professor WARING.

[**232. Advanced Problems of Teaching in Vocational Agriculture.** Second term. Credit two hours. Assistant Professor HOSKINS.] Not given in 1940-41.

233. Apprentice Teaching in Vocational Agriculture. First or second term. Credit to be arranged. Members of the staff in Agricultural Education.

Students with satisfactory experience in directed teaching may be permitted to accept regular teaching responsibilities in the schools under staff supervision if and when such opportunities are available.

234. Seminar. First term. Credit two hours. Instruction for the year 1940-41, planned for graduate students in vocational education. Others may be admitted by permission of the instructor. T 4-5.30. Stone 309. Assistant Professor W. A. SMITH.

A consideration of scientific method in education with particular reference to thesis writing.

[**240. Cooperative Extension Work.** Second term. Credit three hours. Open to graduate students qualified in agriculture or home economics. Professor ———.] Not given in 1940-41.

PREPARATION OF TEACHERS FOR NORMAL SCHOOLS AND COLLEGES

[**241. The Preparation of Teachers for Normal Schools and Colleges.** Second term. Credit two hours. Professor MOORE.] Not given in 1940-41.

245. The College Preparation of Teachers of Agriculture for the Secondary School. Second term. Credit three hours. Should follow course 211a or its equivalent. T Th 11-12.20. Stone 309. Professor STEWART.

A course based upon the work of teachers of agricultural vocations in secondary schools, designed to provide standards for a program of teacher education in a college of agriculture.

248. The Preparation of Teachers of Home Economics for Secondary Schools.

Second term. Credit two hours. Hours to be arranged. Students must consult the instructor before registering. Professor THURSTON.

This course is designed to meet the needs of persons who are especially competent as home economics teachers, and who wish to become qualified to prepare teachers of home economics for secondary schools.

249. **Seminar in Home Economics Education.** First and second terms. Credit two to four hours either term; total credit for the year not to exceed six hours. Hours to be arranged. Students must consult the instructor before registering. Professor THURSTON.

Designed to meet the needs of graduate students who have had experience as home-economics educators in schools, colleges, extension service, business, and so forth. Arrangements are made for students to work on their individual problems. Courses in philosophy and principles of education, psychology, guidance, curriculum, and measurement are recommended as prerequisites or parallel.

250. **Seminar in Agricultural Education.** Second term. Credit two hours. For teachers of agriculture and students whose progress in graduate study is satisfactory. S 9-11. Plant Science 37. Assistant Professor OLNEY.

MEASUREMENT AND STATISTICS

251. **Educational Measurement.** First term. Credit three hours. Candidates for a principal's certificate may register for two-hours credit. Prerequisite, a course in educational psychology. S 11-12.30 and an additional hour to be arranged. Stone 309. Assistant Professor BAYNE.

The use of aptitude and achievement tests and other measuring instruments in the classification and guidance of pupils, improvement of instruction and other activities of the teacher and school officer. Those class members who wish may make a study of their own aptitudes and achievements.

253. **Statistics for Students of Education.** First term. Credit two hours. Primarily for graduate students in education. Open to a limited number of other students upon approval of the instructor. T Th 10. Stone 309. Assistant Professor BAYNE.

A study of common statistical procedure in relation to critical reading of technical studies, research, and to writing reports of studies. In so far as possible the work is related to the problems of the individual student.

ADMINISTRATION AND SUPERVISION

246. **Problems in Industrial and Technical Education.** First and second terms. Credit four hours each term. T Th 2-4. Stone 310. Professor L. A. EMERSON.

Special problems in the administrative, supervisory, and curricular phases of industrial and technical education.

261. **The Administration of Rural Schools.** First term. Credit three hours. Candidates for a principal's certificate may register for two-hours credit. T Th 11 and an additional hour to be arranged. Stone 309. Professor BUTTERWORTH.

A course for students of experience, dealing with the problems of organizing and administering education in the elementary and secondary schools of country and village districts.

[262a. **School Finance.** Second term. Credit two hours. Professor BUTTERWORTH.] Not given in 1940-41.

[262c. **The School Plant.** Second term. Credit two hours. Professor BUTTERWORTH.] Not given in 1940-41.

263. **Procedures and Technic in Supervision.** First term. Credit three hours. Candidates for a principal's certificate may register for two-hours credit. M W F 10. Stone 309. Professor MOORE.

Designed for superintendents, supervisors, and principals. Students who have not had experience in these fields are admitted only upon permission of the instructor. Students taking this course must be prepared to spend four full days or more in observing supervisory procedures in various school systems.

264. Seminar in Rural School Administration. Second term. Credit two hours. Admission only with the approval of the instructor. S 10-11.30. Stone 309. Professor BUTTERWORTH.

The nation's educational program. An analysis of forces that are creating new educational problems, and an appraisal of practices that have been used and of proposals that have been made for meeting them.

[**265. Seminar for Principals.** Second term. Credit two hours. Required of all graduate students who are candidates for a principal's certificate. Professor FERRISS.] Not given in 1940-41.

266. The Supervision of the Elementary School. Second term. Credit three hours. Candidates for a principal's certificate may register for two-hours credit. M W F 9. Stone 309. Professor MOORE.

A course designed for supervisors, elementary-school principals, and superintendents. It includes a consideration of important research studies which have a direct bearing upon the teaching and supervision of the elementary-school subjects.

[**267. The Organization and Administration of Vocational Agriculture in the Public Schools.** First term. Credit three hours. Should follow or accompany course 261. Professor STEWART.] Not given in 1940-41.

269. The Supervision of Home Economics Education. Second term. Credit two hours. Time to be arranged. Students must consult the instructor before registering. Professor THURSTON.

For persons who are now engaged in supervision and in the education of teachers and leaders in service and for those who wish to prepare for such work.

276. Principles of Curriculum Building. First term. Credit three or four hours. Primarily for graduate students. T Th 2-3.30, and an additional hour to be arranged for those wishing to carry further the study of special curriculum problems. Stone 309. Professor FERRISS.

A consideration of the major problems, principles, and technics in determining educational objectives and curriculum content and organization in elementary and secondary schools in the light of modern theory and practice.

[**277. Courses of Study in Vocational Agriculture.** Second term. Credit two hours. Assistant Professor HOSKINS.] Not given in 1940-41.

[**278. Seminar in Rural Secondary Education.** Second term. Credit two hours. Professor FERRISS.] Not given in 1940-41.

EDUCATIONAL THEORY

181. Principles of Education. First or second term. Credit three hours. Prerequisite, a first course in educational psychology. Open to seniors preparing to teach who have completed the required courses in methods and practice teaching or are pursuing such courses. Open also to graduate students preparing to teach. First term, M W F 11. Second term, M W F 9. Caldwell 143. Professor EATON.

A consideration of fundamental principles in education, with special attention to the needs of prospective teachers in the high school.

194. Principles of Vocational Education. First term. Credit three hours. Open to seniors and graduate students who have satisfactorily completed courses in educational psychology and economics or sociology. T Th 11-12.20. Warren 125. Professor EATON.

A study of the nature, the aims, and the socio-economic backgrounds of vocational education.

281. Rural Secondary Education. First term. Credit three hours. Primarily for graduate students. M W F 9. Stone 309. Professor FERRISS.

A consideration of some of the more basic problems in the functions, nature, organization, curriculum, and extension of secondary education in its adaptation to rural and village needs and conditions.

294. Philosophy of Education. Second term. Credit three hours. Open to grad-

uate students whose studies in education are well advanced. T Th 11-12.20. Warren 125. Professor EATON.

An examination of major concepts in education, and of material, spiritual, and social criteria of value in their bearings upon the aims and processes of education.

[295. **Comparative Education.** First term. Credit two hours. Professors BUTTERWORTH, FERRISS, and MOORE.] Not given in 1940-41.

NATURE STUDY

107. **The Teaching of Nature Study and Elementary-School Science.** Second term. Credit three hours. Open to those who have taken or are completing thirty hours in science and have had at least one term of suitable professional work. Lecture, M 12. Practical exercises. T Th 1.40-4. Fernow 8. Miss GORDON.

A study of the content and methods of nature-study and of elementary-school science, with field work and laboratory experience useful in classroom and camp. Recommended for those preparing to teach or supervise science. Laboratory fee, \$1.50.

108. **Field Natural History.** First term. Credit two hours. Not open to freshmen. Lecture, Th 1.40-2.30. Fernow 8. Field work, Th 2.30-5. Professor PALMER and Miss GORDON.

Field trips and lectures devoted to a study of the natural history of five ecological units under different seasonal conditions, with special emphasis on their contributions to the teaching of science. Laboratory fee, \$1.

202. **Nature Literature.** First term. Credit two hours. Open to students who will have completed their preparation for certification as science teachers by the end of the current year. M W 10. Fernow 8. Professor PALMER and Miss GORDON.

Acquaintance with prose, poetry, and fiction useful in enriching science courses in elementary and secondary schools, with critical examination of nature and science texts for the elementary levels.

[209. **The Nature Movement and Its Makers.** First term. Credit two hours. Professor PALMER and Miss GORDON. Not given in 1940-41.

RESEARCH

300. **Special Studies.** Credit as arranged. Members of the staff.

Students working on theses or other research projects may register for this course. The staff members concerned must be consulted before registration.

RURAL SOCIOLOGY

1. **General Sociology.** First or second term. Credit three hours. Open to sophomores. Lectures and discussions, M W F 8. Warren 25. Professor ANDERSON.

This course precedes all others in the department. Its object is to create an understanding of various types of groups, institutions, and organizations that exist in human society. It is an analysis of the human environment in which the individual lives. Both urban and rural society are considered. Fee for materials, \$1.

207. **Sociology Theory.** First and second terms. Credit three hours a term. Alternates with course 208. Prerequisite, permission to register. T Th S 9. Warren 302. Professor ANDERSON.

A course devoted to the critical analysis of sociological theories from the time of Auguste Comte to those of present-day sociologists.

[208. **Systematic Sociology.** First and second terms. Credit three hours a term. Given in alternate years. For graduate students. Professor ANDERSON.] Not given in 1940-41.

This course is designed to present the whole field of study, with special emphasis on the concepts in a system of sociology.

209. **Seminar.** Second term. Credit two hours. Given in alternate years. For graduate students. F 2. Warren 302. Professor SANDERSON.

The structural characteristics and classification of different types of social groups as related to their functions are studied.

111. Rural Community Organization. Second term. Credit three hours. Prerequisite, courses 1 and 12 or the permission of the instructor. Open to juniors, seniors, and graduate students. Lectures and discussions, T Th S 8. Warren 302. Professor SANDERSON.

The application of sociology to the practical problems of community organization. The course covers three main divisions: the use of community organization as a tool for guiding social change; a critical study of New York State rural-community organizations; methods of making organizations effective through developing rural leadership, analyzing community needs, building community programs, and coordinating programs.

211. The Rural Community. First term. Credit two hours. Given in alternate years. Primarily for graduate students. Prerequisite, courses 1 and 12 or their equivalent. F 2. Warren 302. Professor SANDERSON.

A study of the historical development of the rural community; a comparative study of types of rural communities; the rural community as a sociological group and its place in society; methods of community development and organization.

12. Rural Sociology. First or second term. Credit three or four hours. Course 1, or its equivalent, is recommended as prerequisite, but not required. Lectures, discussions, and special reports. First term, T Th S 11; second term, M W F 8. Warren 340. Professor SANDERSON.

A study of the groups, organizations, and institutions found in rural society, their structure and function, and a consideration of means for the improvement of rural social organization.

Those electing four-hours credit meet for an extra period in groups, to prepare reports on special topics and for discussion. Fee for materials, \$3.

112. Rural Recreation. Second term. Credit three hours. Prerequisite, course 1 or 12. T Th 8, and a two-hour laboratory period, to be arranged. Warren 340. Extension Assistant Professor DUTHIE.

A general orientation in the various types of recreational activities, and the methods in which they may be organized to best serve the needs of the rural community. Laboratory fee, \$1.

213. Research in Rural Social Organization. Throughout the year. For qualified juniors, seniors, and graduate students. Hours and credits to be arranged. Professors SANDERSON and ANDERSON.

217. Seminar in the History of Research in Rural Sociology. Second term. Credit three hours. Given in alternate years. Primarily for graduate students. M W F 11. Warren 302. Professor ANDERSON.

[218. **Seminar.** First term. Credit two hours. Given in alternate years. For graduate students. Professors SANDERSON and COTTRELL.] Not given in 1940-41.

A study of research methods in rural sociology.

123. Social-Work Practice. Throughout the year. Open only to juniors and seniors interested in becoming social workers, scout executives, or Camp Fire leaders. This course is offered for the purpose of orienting students who may contemplate entering social work. It is not designed to afford professional training. It consists of individual work at neighborhood houses or in connection with social welfare organizations. Qualified Girl Scouts or Camp Fire Girls may obtain training as assistant troop leaders. Hours and credit to be arranged. Miss STRODE.

124. Social Case Work. First term. Credit three hours. Prerequisite, course 1, one course in psychology, and Sociology 10, or equivalents. M W F 9. Warren 340. Miss STRODE.

An introductory study of the theory and practice of social case work as used in public and private welfare agencies, court and probation work, and the family relations of the school and church. Designed for prospective social workers, and of value to prospective extension workers and teachers.

125. Problems of Rural Social Welfare. Second term. Credit three hours. Prerequisite, course 1, one course in psychology, and Sociology 10, or equivalents. M W F 9. Warren 302. Miss STRODE.

A discussion of the problems and methods of the rural social welfare worker, and of the organization and relationships of local agencies to state and national welfare organizations and administrations.

126. Technics and Procedures in Social Case Work. First term. Credit three hours. Prerequisite, course 124 or 125. M W F 8. Warren 340. Miss STRODE.

A general orientation to social case-work practice, with analysis of the social-case study, the use and development of social resources, and the technics and procedures involved in the social case-work process, with special reference to rural conditions.

132. Rural Leadership. Second term. Credit two hours. For juniors, seniors, and graduate students. Prerequisite, course 1 and permission of instructor. Th 2. Warren 302. Professor SANDERSON.

A seminar course in which leadership is studied from both sociological and psychological points of view.

133. Group Leadership. Second term. Credit three hours. Open with permission of instructor to upperclass students. M W 12, and hour to be arranged. Warren 302. Extension Assistant Professor DUTHIE.

A consideration of the factors involved in group formation, the relationships of the leader to the group, and the group members to each other. The place of the program in group work and the process of program formation are described, with special reference to work with 4-H Clubs, Scouts, and juvenile groups.

Attention is called to related courses offered in the Department of Sociology and Anthropology, College of Arts and Sciences, and in the Department of Family Life, College of Home Economics.

The following courses in the Department of Sociology and Anthropology have been transferred from this department:

10. **The Family** (formerly Rural Social Organization 121).
20. **Social Pathology** (formerly Rural Social Organization 122, Social Problems and Public Welfare Organization).
30. **Personality and the Behavior of Groups** (formerly Rural Social Organization 131, The Social Psychology of Rural Life).

VEGETABLE CROPS

Students planning to specialize to a greater or less degree in vegetable crops should consult the department regarding choice and sequence of courses. A mimeographed sheet outlines the suggestions.

1. Vegetable Crops. Second term. Credit three hours. Lectures, M W 11. East Roberts 222. Laboratory, M T or W 1.40-4. Vegetable greenhouses and East Ithaca gardens. Professor WORK.

A general study of the principles of vegetable growing and handling, giving a comprehensive survey of the industry. Intended for the student who desires a brief general course, and as an introductory course for the student who wishes to specialize in commercial vegetable growing. Economic importance, geography, cultural requirements, marketing, storage, and uses, of the important vegetables. A one-day trip is required, usually the last Saturday of the term; approximate cost, \$2. Laboratory fee, \$2.

2. Special Cash Crops. Second term. Credit three hours. Lectures, T Th 10. Comstock 245. Laboratory, M T W or Th 1.40-4. East Roberts 223. Professor HARDENBURG.

A study of the major cash-crop vegetables grown in New York, including potatoes, field beans, cabbage, and the important canning crops, peas, tomatoes, sweet corn, and snap beans. About one-half of the term's work is devoted to potatoes. A visit to near-by bean elevators is required. Laboratory fee, \$2.50.

12. Grading and Handling Vegetable Crops. First term. Credit three hours.

Lectures, T Th 10. East Roberts 222. Laboratory, T or W 1.40-4. East Roberts 223, vegetable greenhouses, and East Ithaca gardens. Professor WORK.

Geography of vegetable production and distribution. Factors of environment, culture, and handling as affecting quality, condition, and marketing of vegetable crops. Harvesting, grades and grading, packing, shipping-point and terminal-market inspection, transportation, refrigeration, and storage are discussed with reference to the various crops. A two-day trip is required; maximum cost, \$8. Laboratory fee, \$2.50.

101. Vegetable Crops, Advanced Course. Second term. Credit four hours. Prerequisite, course 1 and Botany 31. Lectures, M W F 9. One conference period to be arranged. East Roberts 223. Professor THOMPSON.

A course devoted to a systematic study of the sources of knowledge and opinions as to practices in vegetable production and handling. Results of experiments that have been concluded or are being conducted are studied, and their application to the solution of practical problems is discussed.

113. Types and Varieties of Vegetables. First term. Credit three hours. Prerequisite, course 1 or 2, or permission to register. Lecture and laboratory, M 1.40-4. East Ithaca gardens or East Roberts 223. Professor WORK.

One week of laboratory work preceding the beginning of regular instruction is required from September 19 to 25, 1940. Report at East Ithaca at 9 a.m., September 19. The Department should be notified of intention to register in this course.

This course deals with the taxonomy, origin, history, characteristics, adaptation, identification, classification, exhibition, and judging, of kinds and varieties of vegetables; the characteristics, production, and handling of vegetable seeds. The leading varieties of the vegetable crops are grown each year. The value of the course depends to a great extent upon gaining an acquaintance with the plant material as it grows. For this reason part of the laboratory work is done in the gardens prior to and during registration week. Laboratory fee, \$2.

225. Special Topics in Vegetable Crops. First term. Credit three hours. Prerequisite, course 101 and Botany 31. Given in alternate years. Primarily for graduate students. It is recommended that Botany 231 and 232 precede or accompany this course. Discussions, M W F 9. East Roberts 223. Professors THOMPSON, WORK, RALEIGH, and ORA SMITH and Assistant Professor PLATENIUS.

In this course the student is expected to review critically and to evaluate the more important research publications that deal with vegetable production, handling, and storage problems. In the discussions attention is given to research methods and technics.

231. Research. Throughout the year. For graduates and advanced undergraduates. Credit for undergraduates one or more hours a term, by arrangement. Professors THOMPSON, WORK, HARDENBURG, RALEIGH, and ORA SMITH and Assistant Professor PLATENIUS.

Special problems may be elected in any line of vegetable work. Summer residence is often necessary in connection with experimental problems.

232. Seminar. First and second terms. Required of graduate students taking either a major or a minor in this department. Time to be arranged. East Roberts 222. Members of departmental staff.

WILD-LIFE CONSERVATION AND MANAGEMENT

1. The Conservation of Wild Life. First term. Credit two hours. Lectures, T Th 11 and occasional evenings. Fernow 122. Professors ALLEN, HOSMER, WIEGAND, ADAMS, PALMER, and A. H. WRIGHT, Associate Professors MOTTLEY and YOUNG, Assistant Professors SUTTON, HAMILTON, and KELLOGG, and cooperating specialists.

An introduction to the wild-life resources of North America; the importance of the flora and fauna in our economic and cultural life; the history of wild-life decimation, the present need for conservation, and the methods employed to reestablish the various species.

2. **Game Management.** First term. Credit three hours. Prerequisite, Botany 13 and Ornithology 126 or 131. Lecture, F 11. Fernow 212. Laboratory and field work, S 8-1, and at least four all-day Saturday trips. Professor ALLEN, Doctor KURTZ, and cooperating specialists from the New York State Conservation Department, the United States Biological Survey, and others.

The principles and practices of game management as applied to field, woodland, and aquatic game. Laboratory studies of game species, predators, cover maps, management plans, and feeding methods. Field work includes demonstrations and practice in game surveys, sanctuary and refuge methods, and other game-management practices. Laboratory fee, \$3.

ZOOLOGY

For details of other courses in zoology not listed below see *Entomology*, and also the *Announcement of the College of Arts and Sciences*.

8. **Elementary Taxonomy and Natural History of Vertebrates.** First and second terms. Credit three hours a term. Lecture, M 8. Laboratory, M W 1.40-4 or T Th 1.40-4. McGraw 7. Professor WRIGHT, Assistant Professor HAMILTON, and Doctor RANEY.

Lectures on fishes, amphibians, reptiles, birds, and mammals, dealing with the principles of classification and nomenclature, characteristics, relationships, and bionomics of these groups. The laboratory gives practice in the identification of North American species. Field studies of the local fauna are undertaken during the fall and spring. Several all-day field trips are taken during the year. During May field trips will be taken at 5.30 a. m. Laboratory fee, \$4.50.

9. **General Ornithology.** Second term. Credit three hours. Lecture, W 11. Fernow 122. Field work and laboratory, M W 1.40-4 or T Th 1.40-4. Fernow 210. Professor ALLEN and Assistant Professor KELLOGG.

Introduction to the study of birds, particularly the local species; their songs and habits; designed to give a working knowledge to those wishing to study birds as an avocation, and fundamental to those planning advanced work in ornithology. Laboratory work with bird skins is based on the field work. Laboratory fee, \$3.

22. **Ichthyology, Advanced Systematic and Field Zoology.** Throughout the year. Credit three hours a term. Lectures, T Th 8. McGraw 7. Laboratory, S 8-10.30. Professor WRIGHT, Assistant Professor HAMILTON, and Doctor RANEY.

An amplification of the prerequisite course 8. In the lectures, special emphasis is laid on the principal phases of animal life; the taxonomy, origin, and evolution of fossil and living groups; geographical distribution; and the literature and institutions of zoology. Laboratory periods are devoted to the identification of exotic and indigenous forms. Laboratory fee, \$3.

[23. **Herpetology (Amphibia).** First term. Credit three hours. Professor WRIGHT and Assistant Professor HAMILTON.] Not given in 1940-41. Laboratory fee, \$3.

[24. **Herpetology (Reptilia).** Second term. Credit three hours. Professor WRIGHT and Assistant Professor HAMILTON.] Not given in 1940-41. Laboratory fee, \$3.

[25. **Mammalogy.** First and second terms. Credit three hours a term. Professor WRIGHT and Assistant Professor HAMILTON.] Not given in 1940-41.

Discussion of principal phases of mammalian life: origin, distribution, habits, and literature. Laboratory periods are devoted to methods of field collecting, census taking, life-history studies, preparation of skins and skeletons, and identification of North American species. Laboratory fee, \$3.

67. **Seminar in Systematic Vertebrate Zoology.** First and second terms. Credit one hour a term. Hours to be arranged. Professor WRIGHT.

Life-zone plans of North America, 1817-1937. Distribution and origin of life in North America. Zoogeography of the Old World. Animal coloration. Other topics, to be announced.

110. **Economic Zoology.** First term. Credit one hour. Open to qualified upper-classmen and graduate students. Lecture, W 10. McGraw 7. Several field trips to be arranged. Assistant Professor HAMILTON.

This course is designed to meet the needs of the teacher, agriculturist, extension worker, and professional zoologist. Among the topics treated are: control of injurious mammals, fur farming, economics of the raw fur crop, game mammals, manner of effecting legislation, and a consideration of the laws and their effectiveness in various States.

112. Literature of Economic Zoology, Conservation, and Ecology. Second term. Credit one hour. Th 7.30 p.m. McGraw 7. Professor WRIGHT, Assistant Professor HAMILTON, and Dr. RANEY.

The literature of economic zoology, ecology, limnology, oceanography, and kindred fields; fish and fisheries (for profit and pleasure); amphibians and reptiles, their uses; small and big game (commercial and sport); aquaria; zoological gardens; preserves; game farms; animals in relation to recreation, settlement, forestry, agriculture, and other industries; biologic resources, their exploration, conservation, utilization, and management.

126. Advanced Ornithology. First term. Credit three hours. Prerequisite, course 9. Lecture, W 11. Laboratory, T Th 1.40-4. Fernow 210. Professor ALLEN and Mr. _____.

The structure and classification of birds; geographical distribution; the literature and institutions of ornithology; identification of representative birds of the world. The first part of the term is devoted to field work on the fall migration, and to the identification of birds in winter plumage. Designed primarily for students specializing in ornithology or animal biology. Laboratory fee, \$3.

131. Applied Ornithology. First term. Credit three hours. Should be preceded by course 9, and presupposes an elementary knowledge of botany and entomology. Lecture, W 9. Laboratory, M W 1.40-4. Fernow 210. Assistant Professor KELLOGG.

This course is intended primarily for students planning to teach biological science or to engage in professional work in ornithology or wild-life management. The food and feeding habits of birds, field collecting, preparation of specimens, and natural-history photography are emphasized, together with classroom, museum, and biological survey methods. Laboratory fee, \$3.

133. Advanced Field and Museum Methods in Ornithology. First term. Credit three hours. Prerequisites, Ornithology 9, 126, and 131, and permission to register. For students planning to participate in scientific expeditions and to carry on taxonomic work in ornithology. S 8-1, with lecture during laboratory. Several all-day field trips. Fernow 308. Assistant Professor SUTTON.

This course includes such subjects as: field and museum equipment; collecting and preparing birdskins and the preparation of taxonomic papers and avifaunal lists, drawings in line, half-tone, or full color, and other illustrative material. Laboratory fee, \$3.

136. Seminar in Ornithology. Throughout the year. Without credit. Open to qualified undergraduates and required of all graduate students in ornithology. M 7.30-9. Fernow Seminar Room.

400. Research Problems. Ordinarily limited to seniors. Credit and hours to be arranged. Problems may be undertaken in any phase of zoology, but the consent of the instructor concerned is a prerequisite.

COURSES IN OTHER COLLEGES THAT MAY BE OFFERED TO MEET THE SPECIFIC REQUIREMENTS OF REGULAR STUDENTS IN THE COLLEGE OF AGRICULTURE

2. English: Introductory Course in Composition and Literature. Throughout the year. Credit three hours a term. May not be entered the second term. M W F 8, 9, 10, 11, 12, and T Th S 8, 9, 10, 11. Rooms to be announced. Messrs. TENNEY, ADAMS, ANDERSON, BARKER, CURTIN, DUFFY, JONES, MOORE, MYERS, SALE, SIBLEY, THOMPSON, WIENER, WILSON, and others.

The course, open to freshmen who have satisfied the entrance requirements in English, is a training in the reading and writing of English. All those who elect this course must apply as follows for assignment to sections: the first term at

Barton Hall; the second term at Goldwin Smith C. Assistant Professor TENNEY is in charge of the course.

2a. **English: Introductory Course in Composition and Literature.** Second term. A repetition of the first term of English 2. T Th S 8. Goldwin Smith A.

102. **General Chemistry.** Throughout the year. Credit, six hours on completion of the course. Open only to those students who do not offer entrance chemistry. Lecture, Th or F 11. Baker, Main Lecture Room. Recitation, one hour a week to be arranged. Laboratory, M T W Th or F 1.40-4. Professors BROWNE and LAUBENGAYER, Doctor SAUM, and assistants.

This course deals with the fundamental laws and theories of chemistry and the properties of the more common elements and their compounds. Deposit, \$11 each term.

104. **General Chemistry.** Throughout the year. Credit, six hours on completion of the course. Prerequisite, entrance credit in chemistry. Lecture, M or T 11. Baker, Main Lecture Room. Recitation, one hour a week to be arranged. Laboratory, M T W Th or F 1.40-4. Professor PAPISH, Doctor EATON, and assistants.

This course deals with the fundamental laws and theories of chemistry and the properties of the more common elements and their compounds. Deposit, \$11 each term.

100. **Introductory Geology.** First or second term. Credit three hours. Lectures: first term, T Th 9; second term, T Th 11. Warren 25. Laboratory, M T W Th or F 1.40-4. McGraw. Students must register for laboratory assignment before the beginning of the course. Professor NEVIN and Doctor BERTHIAUME.

This course is planned to give beginners the fundamental principles of this branch of science. Laboratory and field trips fee, \$2.75.

1. **Hygiene.** First term. Credit one hour. One lecture-recitation each week, with preliminary and final examination. The use of a textbook is required.

Sections for men: Professor SMILEY, Assistant Professors GOULD, SHOWACRE, and DEYOE.

Sections for women: Assistant Professors EVANS and CUYKENDALL and Doctor STELLE.

Students must report for registration and assignment to sections, the men at the Old Armory, the women at Sage Gymnasium.

2. **Hygiene.** Second term. Credit one hour. One lecture-recitation each week, with preliminary and final examination. The use of a textbook is required.

Sections for men: Professor SMILEY, Assistant Professors GOULD, SHOWACRE, and DEYOE.

Sections for women: Assistant Professors EVANS and CUYKENDALL and Doctor STELLE.

Students must report for registration and assignment to sections, the men at the Old Armory, the women at Sage Gymnasium.

3. **Introductory Experimental Physics.** First term. Credit three hours. Courses 11 and 12 are parallel to courses 3 and 4. No credit is given for them after course 3 is taken. Demonstration lectures, M F 9 or 11. Rockefeller A. Professor GIBBS. One laboratory period a week, as arranged. Rockefeller 220. One recitation period a week, as arranged, required of students who do not offer entrance physics, but open to others. Assistant Professor BACHER, Messrs. BOCK, CONNELLY, GREISEN, JONES, McCUE, MEIJER, and PARKER.

Mechanics, properties of matter, sound, and heat. Laboratory fee, \$5.

4. **Introductory Experimental Physics.** Second term. Credit three hours. A continuation of course 3. Prerequisite, course 3 or entrance physics. Lectures, M F 9 or 11. Professor HOWE. Laboratory staff as in course 3.

Electricity, magnetism, and light. Laboratory fee, \$5.

1. **Introductory Zoology.** First and second terms. Credit three hours a term. If taken after General Biology 1, credit two hours a term. Lectures, T Th 9 or 11. Goldwin Smith B. Laboratory, M T W Th or F 1.40-4, T W F 10-12.20, or S 8-10.20. McGraw 102 and 104. Assistant Professor YOUNG, Doctor MEKEEL, and assistants.

During the first term, the structural and functional organization of a complex animal is studied. In the second term, comparisons are made of the body plans of a graded series of animals representing the major diversions of the animal kingdom. Classification, interrelationships, and adaptations are discussed, also the critical periods in the evolution of the vertebrates and of man. This course, or its equivalent, is a prerequisite to advanced work in the department. Fee, \$3 a term.

UNIVERSITY REQUIREMENTS IN MILITARY SCIENCE AND TACTICS, AND PHYSICAL TRAINING

MILITARY SCIENCE AND TACTICS

1. Basic Course. Required. Throughout the year. The complete course covers two years. Every able-bodied male student, a candidate for a baccalaureate degree, who is required to take five, six, seven, eight, or more terms in residence (or the equivalent in scholastic hours), must take, in addition to the scholastic requirements for the degree, one, two, three, or four terms, respectively, in the Department of Military Science and Tactics. Three hours a week, M T W or Th 1.40-4.10 p. m. Barton Hall.

The requirements in Military Science and Tactics must be completed in the first terms of residence; otherwise the student will not be permitted to register again in the University without the consent of the University Faculty.

Aliens or others who are officially relieved of the requirement in Military Science and Tactics are subject to the requirement of an equivalent period of work in the department of physical training.

The course of training is that prescribed by the War Department for Senior Division Units of the Reserve Officers' Training Corps for basic students. Instruction is offered in Infantry and Field Artillery. For details concerning the course see the Announcement of the Department of Military Science and Tactics.

PHYSICAL TRAINING

1. Physical Training for Men Excused from Military Science (Freshmen). Throughout the year, three periods a week. Class and squad work and prescribed exercises. Mr. O'CONNELL and assistants.

2. Physical Training for Men Excused from Military Science (Sophomores). Throughout the year, three periods a week. Class and squad work and prescribed exercises. Mr. O'CONNELL and assistants.

3. Physical Training for Men (Juniors and Seniors). Building-up and corrective exercises as prescribed by the medical examiners as a result of the physical examination required of all students in the University. Mr. ———.

6. Physical Training for Women (Freshmen). Throughout the year, three periods a week. Misses BATEMAN, ASHCROFT, ATHERTON, and DORNEY, and Mrs. BAIRD.

7. Physical Training for Women (Sophomores). Throughout the year, three periods a week. Misses BATEMAN, ASHCROFT, ATHERTON, and DORNEY, and Mrs. BAIRD.

The program consists of six weeks of outdoor sports in fall and spring, indoor activities in the winter months. The activities offered during the year are archery, badminton, baseball, basketball, canoeing, fencing, folk dancing, fundamentals, golf, hockey, individual gymnastics, life saving, modern dance, outing, riding, riflery, soccer, swimming, tap dancing, tennis, volleyball.

ELECTIVE COURSES IN MILITARY SCIENCE AND TACTICS, AND HYGIENE AND PREVENTIVE MEDICINE

A description of all other courses available for election by students in the College of Agriculture may be found in the announcements of the other colleges of the University.

MILITARY SCIENCE AND TACTICS

2. Advanced Course. Elective. Throughout the year. The complete course covers two years. Credit two hours a term. Prerequisite, course 1 in the arm or service selected. Five hours a week, and in addition attendance at a Summer Training Camp of six-weeks duration. Hours by assignment. Barton Hall.

The course of training is that prescribed by the War Department for Senior Division Units of the Reserve Officers' Training Corps for advanced students. Instruction is offered in Infantry and Field Artillery.

Upon successful completion of the Advanced Course a student may be commissioned as a Reserve Officer of the United States Army, in the appropriate arm or service, upon the recommendation of the Professor of Military Science and Tactics. For details concerning the course, see the Announcement of the Department of Military Science and Tactics.

Course 2 may be elected only by permission of the Director of Resident Instruction in the College and of the Professor of Military Science and Tactics. Credit is counted in the twenty elective hours allowed outside the College of Agriculture (page 20).

HYGIENE AND PREVENTIVE MEDICINE

All entering students are required to report to the Medical Advisers' Office to make an appointment for a physical examination during the registration days of the first term. Such examination shall be repeated periodically thereafter as indicated by the results of the first or subsequent examination.

Seniors are required to make an appointment for a physical examination during the regular registration days of their last term of residence.

All freshmen are required to include Hygiene 1 and 2 in their schedules.

The following courses may be elected for credit. Prerequisite for these courses, Hygiene 1 and 2 (page 71). Registration at Hygiene office, Barton Hall.

3. Hygiene: Health Supervision of School Children. Second term. Credit three hours. Open to sophomores, juniors, and seniors. Prerequisites, suggested but not demanded, Human Physiology and Anatomy. M W F 12. Stimson, Histology Lecture Room. Assistant Professor GOULD.

A practical course of lectures and demonstrations designed to familiarize the student with the facts and methods necessary for making an effective health supervision of school children.

4. Hygiene: Advanced First Aid. First or second term. Credit one hour. Prerequisite, Human Anatomy or Human Physiology. Enrollment limited and registration only after conference with the professor in charge. F 9. Stimson, Anatomy Lecture Room. Assistant Professor SHOWACRE.

This course includes the theory of the diagnosis and temporary treatment of the common emergencies with practical application of the essential fundamentals.

5. Hygiene: Industrial Hygiene. First term. Credit two hours. T Th 12. Stimson, Histology Lecture Room. Assistant Professor GOULD.

Factory sanitation, ventilation, and illumination; occupational poisoning and disease; factory legislation; accident prevention; fatigue in industry; preventive medicine in industry.

7. Hygiene: Rural Hygiene. Second term. Credit two hours. T Th 12. Stimson, Histology Lecture Room. Assistant Professor DEYOE.

A general consideration of the health problems peculiar to rural areas with the presentation of practical schemes for the solution of these problems as far as possible.

8. Hygiene: Mental Hygiene. First and second terms. Credit two hours. Section 1, M F 11. Stimson. Assistant Professor DARLING. Section 2, T Th 2. Stimson, Histology Lecture Room. Dr. STELLE.

The relationship of the structure of the total personality to environmental maladjustment as evidenced by physical and social behavior; a discussion of the more common personality difficulties and the rôle of insight in the prevention of these.

GENERAL INFORMATION

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 administrative and classroom building, Roberts Hall, connected by covered loggias with the Dairy Building, now East Roberts, on the east, and with Stone Hall, now occupied by the Department of Rural Education and by the College Library, on the west. Subsequently, the legislature provided for the erection of two large barns, a greenhouse range, a forestry building (Fernow Hall), a poultry-husbandry building (Rice Hall), a soils building (Caldwell Hall), an auditorium, a classroom building (Wing Hall) and a stock-judging building for animal husbandry, several small poultry buildings, a sheep barn, a swine barn, a farm shop and tool shed, and an insectary. There are, in addition, a fish-breeding house in Cascadilla Creek, a seed-storage house, a cold-storage and packing house, and other small buildings on the farms. In 1920 the State authorized the College to plan a further development of its building program involving an expenditure of \$3,000,000. Under this building plan \$500,000 was appropriated in 1920 for a new dairy building, and in 1922 provision was made for its equipment. The building came into use in the fall of 1923. A further appropriation of similar amount was used for completing the Dairy Building, erecting an additional greenhouse range, moving and remodeling the Agricultural Engineering laboratories, and constructing the foundation for the Plant Science Building. The last-named building was completed under an appropriation of \$1,100,000 made by the Legislature of 1928, and occupancy began with the second term of 1930-31. The Legislature of 1930 provided \$400,000 for the equipment of the Plant Science Building and appropriated \$100,000 for additional barns and other smaller buildings for the Department of Animal Husbandry. It also appropriated \$100,000 for the construction of the foundation of a building for the Departments of Agricultural Economics and Rural Sociology, and to this sum the Legislature of 1931 added \$500,000 for the completion of the building. The new barns for sheep, swine, and beef cattle were completed in 1931. The Departments of Agricultural Economics and Rural Sociology occupied their new building, more recently named Warren Hall, in February 1933. In 1934-35 the completion of a new Home Economics building, named Martha Van Rensselaer Hall, made it possible to move the Department of Entomology into the building previously occupied by the College of Home Economics. The building is now named Comstock Hall. The horse barn and the sheep barn were destroyed by fire in 1938 and have subsequently been replaced.

THE FARMS

The College of Agriculture farm includes 1827 acres. It is 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, little more than one-half of the total area is now available for tillage. Of the 1827 acres, 1064 are classified as arable, 400 as pasture, and 300 as wood and waste, and 63 are devoted to buildings, lots, and gardens. There are in addition 157 acres of tillable land rented by the College.

Part of the tillable area has been assigned to departments as follows: Agronomy, 22 acres; Animal Husbandry, 412 acres; Floriculture and Ornamental Horticulture, 26 acres; Plant Breeding, 67 acres; Pomology, 99 acres; Poultry Husbandry, 142 acres; Vegetable Crops, 23 acres; and there are left to the Office of Farm Practice and Farm Superintendence 273 acres on which to conduct the regular farm operations. Of the other areas, the Department of Animal Husbandry has the use of all the pasture land; the Department of Forestry administers 131 acres of woodland under systematic forest management; it also has the privilege of using an area of approximately 500 acres of typical upland woods and abandoned farm lands in the Connecticut Hill section in Tompkins County; and the Department of Entomology uses about 5 acres of waste land for a fish hatchery.

The college farm is composed of a variety of soil types. About two-thirds of the tillable area is Dunkirk clay loam. This soil 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 remaining third is Canfield silt loam, Wooster gravelly silt loam, and Volusia gravelly silt loam.

In addition to the lands mentioned, there has been conveyed to Cornell University the Matthias H. Arnot Forest of 3600 acres, for the use of the Department of Forestry. Over the greater part of its area the Arnot Forest is made up of second-growth hardwoods and hemlock. It lies mostly in Schuyler County, near the village of Cayuta and within twenty miles of Ithaca.

Through the generosity of Mr. John P. Young, an area of approximately 540 acres has been given to the University. This consists of several parcels of land, both wooded and open, in the Connecticut Hill region, some fifteen miles west of Ithaca, and well adapted to research work and graduate instruction in forestry and in the plant sciences generally.

A square mile of typical Adirondack timberland in Essex and Hamilton Counties has been deeded to Cornell University by Finch, Pruyn, and Company for forest experiments to be conducted by the Department of Forestry in collaboration with the United States Forest Service. This tract is known as the Finch-Pruyn Co-operative Experimental Forest.

THE COLLEGE LIBRARIES

. The library facilities of the College of Agriculture include: a large collection of books and periodicals on agriculture, animal husbandry, botany, horticulture, forestry, entomology, and other kindred subjects, contained in the University Library and numbering about forty thousand volumes; the Agricultural College Library in Stone Hall, with a working and reference collection of more than one hundred thousand bound volumes and a large number of bulletins, reports, and other pamphlets in unbound form; and various small departmental collections for laboratory and office use. Included in these are the Craig horticultural library, gift of the widow of the late Professor John Craig, and the A. I. Root Memorial Library, recently begun but already containing more than fifteen hundred volumes in the field of apiculture. The Department of Animal Husbandry has a large and rapidly increasing collection of herdbooks, registers, and the like, for the use of its instructing staff and its students. Altogether more than one hundred and fifty thousand volumes are available for the instructing staff and the students of the College of Agriculture. Wherever they are housed, the books are regularly catalogued at the University Library, as well as at the Agricultural library.

All these libraries are likewise provided with the principal periodicals relating to agriculture and kindred subjects. In the University Library are to be found files and current numbers of many leading foreign periodicals, especially those of a purely scientific character used chiefly for research. The Agricultural Library carries on its shelves more than eight hundred periodicals of various kinds for the use of students and faculty; these include the principal agricultural, horticultural, and stock-raising journals of the United States and Canada, together with many from foreign countries. The Entomological Library is supplied with the leading periodicals relating to general and economic entomology. In addition to these, many of the departments receive periodicals for the use of instructors and students; and the Departments of Agricultural Economics, Animal Husbandry, Dairy Industry, Floriculture and Ornamental Horticulture, Forestry, Plant Breeding, Plant Pathology, and Poultry Husbandry maintain small reading rooms of their own.

Certain of the books of the Agricultural College Library are likely to be in reserve for reference purposes only, and students are then allowed to draw them for home use only when the library is closed over night and over Sunday. In order to afford the greatest possible opportunity for using the books, the Agricultural College Library is open from eight in the morning until ten o'clock at night every day of the week during the college year except Saturday, when it is closed at five o'clock in the afternoon.

SCHOLARSHIPS

THE STATE UNIVERSITY SCHOLARSHIPS

Under Chapter 292 of the Laws of 1913, as amended by Chapter 502, Laws of 1920, and Chapter 130, Laws of 1924, the State of New York maintains scholarships, five of which are awarded each county annually for each assembly district therein. Each of these scholarships entitles the holder to \$100 for each year while he is in attendance upon an approved college in this State during a period of four years. These are called the *State University Scholarships*. At Cornell they are commonly known as the *State Cash Scholarships*, to distinguish them from the State Tuition Scholarships in this University. They are awarded by the State Commissioner of Education at Albany, to whom application should be made for any information about the conditions of award, or for any information about the rules of administration.

THE UNIVERSITY UNDERGRADUATE SCHOLARSHIPS

The University Faculty annually awards a limited number of scholarships to members of the incoming Freshman class who attain high standing in a special competitive examination held in Ithaca early in the fourth week of September, beginning on the first day of registration. Some of these scholarships are worth more than others, and they are all awarded according to the relative rank which the successful competitors attain in the examination, the more valuable to the more successful. A competitor may win one scholarship of one of these three groups:

(a) Five George W. Lefevre Scholarships, each having an annual value of \$400 and being tenable each year so long as the holder remains in good standing in the University as undergraduate or graduate student; only those candidates are eligible for Lefevre Scholarships who furnish proof of their financial need.

(b) Two Eudorus C. Kenney Scholarships (if they are to be awarded by the Faculty Committee on Scholarships), each continuing for four years and having an annual value of \$250.

(c) Eighteen University Undergraduate Scholarships, each continuing for two years and having an annual value of \$200.

See the *General Information Number* for the rules of award.

SEARS, ROEBUCK SCHOLARSHIPS

Twenty scholarships of the value of \$150 each are made available by the Sears, Roebuck Company for farm-reared freshmen entering in 1940-41. The awards are made on the basis of financial need and of scholastic promise in the field of agriculture. Applications are to be addressed to the Office of Resident Instruction, Roberts Hall, Ithaca, New York, and must be complete by July 15.

NEW YORK STATE BANKERS ASSOCIATION SCHOLARSHIP

A scholarship of \$150 is offered for 1940-41 by the New York State Bankers Association to a young man who has been a 4-H Club member who is recommended by his 4-H Club agent. It is to be awarded for the freshman year on the basis of financial need, scholarship, and the promise of service to agriculture. The 4-H Club agent in each county of New York State may recommend one candidate to whom he will forward an application form. Applications must be on file in the Office of the State Leader of Junior Extension, Roberts Hall, Ithaca, New York, by June 1.

THE ROBERTS SCHOLARSHIPS

The Roberts Scholarship Fund, a gift of the late Dr. Charles H. Roberts, of Oakes, Ulster County, New York, provides ten scholarships, each retainable for one year, but not open to newly entering students. As expressed by the founder, the purpose of these scholarships is to furnish financial assistance to students in the College of Agriculture who are of good moral character, who show native ability, tact, and application, and who are in need of such assistance, especially students coming from rural districts. The awards are made after the close of each year. Application blanks and copies of the regulations may be obtained at the office of the Secretary of the College of Agriculture. All applications must be on the official blanks, which, with all other information, must be filed with the Secretary of the College by June 1. The present value of each scholarship is \$110.

DREYFUS MEMORIAL SCHOLARSHIPS

Two scholarships of an annual value of \$500 each have been established by Mrs. Berta E. Dreyfus in memory of her husband, Dr. Louis A. Dreyfus. In their award preference is given first to students coming from the high schools of Richmond County, New York, and next to those from Sandusky County, Ohio. First consideration is given to those specializing in Chemistry, Engineering, or Agriculture or, in the case of women, in Home Economics or Arts and Sciences. Application must be made to the Dean of the University Faculty before the first Wednesday of May.

HERVEY S. HALL SCHOLARSHIPS

The Hervey S. Hall Scholarship, established by bequest of Miss Mary F. Hall, of Spencer, New York, and having an annual value of \$120, is to be awarded to a properly qualified student of either sex, a resident of New York, pursuing a course in Agriculture leading to the degree of bachelor of science, and in need of financial aid. It is "to be granted first to a student from the town of Spencer, New York, should a suitable candidate appear, or else to a student from Tioga County, or from the State at large." Application for this scholarship should be made to the Secretary of the College by June 1.

THE NEW YORK FLORISTS CLUB SCHOLARSHIPS

The New York Florists Club offers for 1940-41 three scholarships, each having a value of \$200, divisible at the discretion of the faculty. These awards are to be made to students of the junior or the senior class who are specializing in the field of Floriculture and Ornamental Horticulture. Applications for these scholarships should be made to the Secretary of the College by June 1.

THE ROBERT M. ADAMS 4-H MEMORIAL SCHOLARSHIP

The Robert M. Adams 4-H Memorial Scholarship was established in honor of Professor R. M. Adams by the 4-H Clubs of the State and the first award was made in 1938-39. The scholarship yields approximately \$50 a year. Students who are New York residents are eligible to apply after their first year in the College, and those who have been 4-H club members are given first consideration. The award is based on financial need, character, ability, and scholarship. Application for this scholarship should be made to the Secretary of the College by June 1.

OTHER SCHOLARSHIPS

A description of other scholarships open under certain conditions to undergraduates in the College of Agriculture will be found in the *General Information Number*.

PRIZES

THE EASTMAN PRIZES FOR PUBLIC SPEAKING

With the object of developing qualities of personal leadership in rural affairs, Mr. A. R. Eastman, of Waterville, New York, established annual prizes, the first of \$100 and the second of \$20, for public speaking on country-life subjects. These prizes are designated the Eastman Prizes for Public Speaking. Competition is open to any regular or special student in the College of Agriculture. The contest takes place in February.

THE RICE DEBATE STAGE

To stimulate the study and public discussion of vital farm-life problems, Professor James E. Rice, Professor of Poultry Husbandry, emeritus, has established annual prizes, the first of \$100 and the second of \$25. The contest of 1940-41 is in the form of a debate. Preliminary trials are held in December, on a subject to be announced. The final competition is held in Farm and Home Week. All regular or special students are eligible.

THE RING MEMORIAL PRIZES

By bequest of Mr. Charles A. Ring, of Niagara County, New York, a first prize of approximately \$25 and a second prize of approximately

\$15 have been established, to be awarded to undergraduate students in Agriculture who, in essays giving reviews of the literature on problems in floriculture, vegetable gardening, or pomology, show the greatest ability to evaluate scientific evidence. The contest is open to students who have taken or are taking courses in the horticultural departments and who are scholastically in the upper fourth of the senior class in Agriculture. A list of those eligible is announced each year. The essays must be submitted to the Secretary of the Faculty of Agriculture by noon on May 1.

THE CHARLES LATHROP PACK FOUNDATION FORESTRY PRIZE

The Charles Lathrop Pack Foundation Forestry Prize is in the amount of \$40, and is awarded annually in April for the best essay on forestry submitted by a resident student who has taken some course in forestry during the current college year. The purpose of the prize is to aid in training men and women to write articles which will arouse in the public an interest in forestry and an appreciation of what forestry means to the country. The award is made by a committee appointed by the President of the University. The detailed regulations are furnished by the Department of Forestry or by the Secretary of the College. The essay must be deposited at the office of the head of the Department of Forestry by noon of April 15.

ALUMNI PRIZE

The Alumni Association of the College of Agriculture contributes an annual prize of \$25 to be awarded at the close of the junior year to the student who has maintained the best scholastic record during his three years in the University, the award to be made by the Faculty of the College.

ALPHA ZETA CUP

The Alpha Zeta fraternity has presented a prize cup to be awarded for custody for one year to the male student in the College of Agriculture making the best scholastic record during the freshman year. For students first admitted in the second term, the average of three terms' work is considered. Presentation of the cup is made at the opening of the fall term.

OTHER PRIZES

For information concerning other prizes offered in the University and open to competition of students in the College of Agriculture, see the special pamphlet on prizes, which may be obtained upon application to the Secretary of the University.

LOANS

The New York State Grange has established a loan fund to aid its members in obtaining a higher education. Applications may be made to Mr. H. M. Stanley, Skaneateles, New York.

A fund contributed by students of the College is available for small, short-time, emergency loans. Application may be made to the College Secretary.

A fund, the interest on which is available for loans to students specializing in Floriculture, has been established by Mr. Max Schling of New York City.

Another loan fund for students of Floriculture, with principal and interest available, has been contributed by the New York Florists Club. Applications for loans from this and the preceding fund may be made to the College Secretary.

Notice of other loan funds, available to students of all colleges in the University, is found in the *General Information Number*.

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