Courses in agriculture: 1931-1932. 1931

University of Wisconsin. College of Agriculture
Madison, Wisconsin: [University of Wisconsin, College of Agriculture], 1931

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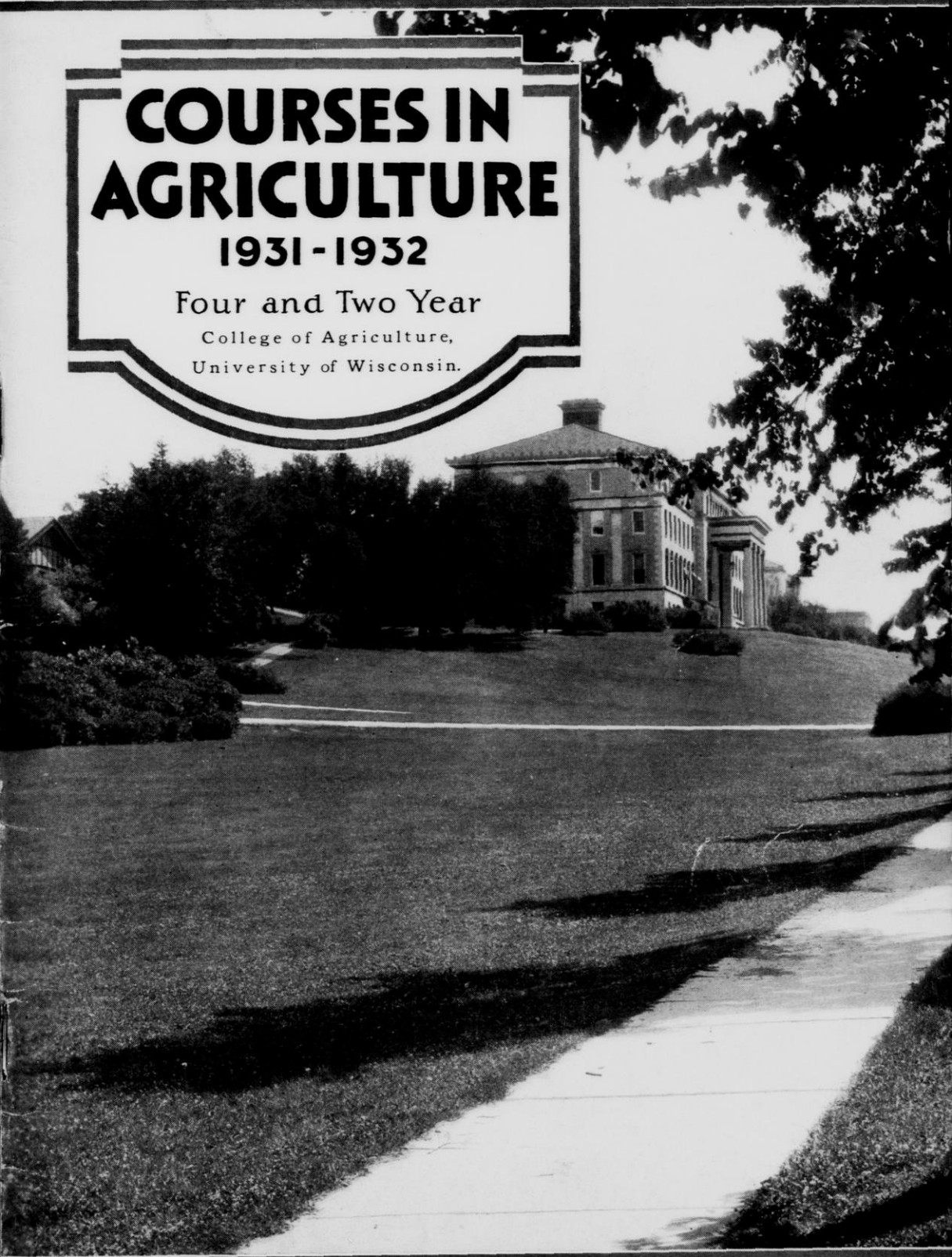
COURSES IN AGRICULTURE

1931-1932

Four and Two Year

College of Agriculture,
University of Wisconsin.



Serial No. 1724 Bulletin of the University of Wisconsin. General Series No. 1498

THE UNIVERSITY OF WISCONSIN

LONG AND MIDDLE COURSES IN AGRICULTURE

COLLEGE OF AGRICULTURE

1931-32

BULLETIN OF THE UNIVERSITY OF WISCONSIN
Serial No. 1724; General Series No. 1498

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Madison, Wisconsin
February, 1931

CALENDAR

ACADEMIC YEAR 1931-32

FIRST SEMESTER

Sept. 11, 12	Friday, Saturday	Examinations for admission
Sept. 16-22	Wednesday-Tuesday	Freshman Period (attendance required)
Sept. 18-22	Friday-Tuesday (noon)	Registration days for other new students
Sept. 19-22	Saturday-Tuesday noon	Registration days for old students
Sept. 23	Wednesday	Instruction begins
Sept. 26	Saturday	Special examinations for removal of conditions
Nov. 26	Thursday	Thanksgiving Day; legal holiday (one day only)
Dec. 18	Friday (noon)	Christmas recess commences
Jan. 5	Tuesday (8 a.m.)	Instruction resumed
Jan. 16	Saturday	Examinations for removal of conditions
Jan. 25-Feb. 3	Monday-Wednesday	Final examinations

SECOND SEMESTER

Feb. 1, 2	Monday, Tuesday	Examinations for admission
Feb. 4	Thursday	Registration day for new and re-entered students
Feb. 8	Monday	Instruction begins
Feb. 22	Monday	Washington's Birthday; legal holiday
April 5	Tuesday, after last class	Spring recess commences
April 13	Wednesday (8 a.m.)	Instruction resumed
April 16	Saturday	Examinations for removal of conditions
May 30	Monday	Memorial Day; legal holiday
June 6-14	Monday-Tuesday	Final examinations
June 13, 14	Monday, Tuesday	Examinations for admission
June 18	Saturday	Alumni day
June 19	Sunday	Baccalaureate day
June 20	Monday	Commencement day

SUMMER SESSION 1932

June 27	Monday	Registration day, University at large
June 28	Tuesday	Instruction begins, University at large
July 4	Monday	Independence Day; legal holiday
August 5	Friday	Six-week session closes
August 26	Friday	Nine-week session closes.

THE REGENTS OF THE UNIVERSITY

	Term expires
State-at-Large—Carl Drexler, Menasha	1936
State-at-Large—Gunnar Gundersen, La Crosse	1937
State-at-Large—John C. Schmidtmann, Manitowoc	1932
State-at-Large—Arthur Sholts, Oregon	1935
First District—Victor P. Richardson, Janesville	1931
Second District—Fred H. Clausen, Horicon	1936
Third District—Harold M. Wilkie, Madison	1937
Fourth District—Mrs. Meta Berger, Milwaukee	1934
Fifth District—Judge August C. Backus, Milwaukee	1933
Sixth District—Miss Elizabeth A. Waters, Fond du Lac	1933
Seventh District—Mrs. Clara T. Runge, Baraboo	1932
Eighth District—George W. Mead, Wisconsin Rapids	1934
Ninth District—Herman W. Ullsperger, Sturgeon Bay	1936
Tenth District— Ben F. Faast, Eau Claire	1932
Eleventh District—Peter Eimon, Superior	1935

John Callahan, State Superintendent of Public Instruction, *ex-officio.*
Glenn Frank, President of the University, *ex-officio.*

OFFICERS OF THE REGENTS

Ben F. Faast, President
Miss Elizabeth A. Waters, Vice President
Solomon Levitan, State Treasurer, *ex-officio* Treasurer
James D. Phillips, Business Manager
Maurice E. McCaffrey, Secretary

THE BOARD OF VISITORS

Appointed by the Regents

	Term expires
George P. Hambrecht, Madison	1931
Loyal Durand, Milwaukee	1932
Harry W. Kircher, Sheboygan	1933
Mrs. Charles R. Carpenter, Madison	1934

Appointed by the Alumni

Charles L. Byron, Chicago	1931
B. E. McCormick, Madison	1932
Mrs. Lucy M. Johnson, Madison	1933
B. A. Kiekhofer, Milwaukee	1934

Appointed by the Governor

Dr. W. C. Sullivan, Kaukauna	1930
Mrs. Hattie C. Tegtmeyer, Milwaukee	1931
Mrs. Allan Classon, Oconto	1932
Carl J. Hesgard, Orfordville	1933

THE COLLEGE OF AGRICULTURE

Chris L. Christensen, Dean and Director
J. A. James, Assistant Dean
K. L. Hatch, Associate Director of Extension
N. Clark, Assistant Director of Experiment Station
A. J. Haas, Executive Secretary

THE FUTURE

THE FUTURE of a great nation depends on a progressive agriculture and the majority of the rural leaders of the future must be men and women trained in the problems of the nation and community, home and the farm. Agriculture is the most important business in the world today because its products are the necessities for the future of other industries.

Men are needed who have the capacity to comprehend the situation, the ability to interpret social and economic factors, and the power to direct the energies of the people in making the necessary civic, political, and business adjustments of the future. Responsible positions are unfilled today for lack of competent men to fill them. It is a wonderful opportunity for ambitious young men. The country needs leaders. Will you prepare yourself to meet the call? The University of Wisconsin through its College of Agriculture is equipped to train you for a future in leadership for agriculture.

HERE ARE MANY OPPORTUNITIES

Many aspects of business, transportation, manufacturing, marketing, banking, publishing, teaching and the like are closely related to the operations of the farm. The man who engages in these fields finds himself constantly placed in contact with the agricultural problems, usually of an economic character. The Agricultural College fits men for a variety of types of work and a study of our graduates finds them filling more than a hundred types of positions for which their agricultural college course was a fundamental training. Training for production on the farm is but one of the opportunities of the graduate of the agricultural courses.

A study of positions held by the graduates of 42 years of this college shows 78 per cent in agricultural work with 10 per cent more indirectly connected with agriculture. Of the graduates 25 per cent were farming, 15 per cent in non-agricultural positions, 17 per cent were in commercial positions and the remaining 43 per cent were in educational work as graduate students, teachers, county agents, extension specialists, regulatory work, bankers' agents, etc. A few important types of work are suggested.

THE FARM. The opportunity and the financial income on the farm are equal to returns in other lines of agricultural effort. Many graduates are going from the agricultural college direct to the farm.

FARM SUPERINTENDENTS AND FARM MANAGERS are in demand; these positions afford opportunity to accumulate capital in preparation for future ownership.

COMMERCIAL PHASES OF AGRICULTURE. Manufacturers of farm implements, tractors, gas engines, fertilizers, dairy products, and so forth, want men with agricultural college training for office, field, extension and sales.

AGRICULTURAL EXTENSION AND COUNTY AGENTS. The state colleges and the United States Department of Agriculture need specialists in all lines of agricultural extension. The demand for county agricultural agents is far in excess of the supply of trained men.

BANKS, DEVELOPMENT COMPANIES, RAILROADS. The business man realizes the dependence of business on the success of the farmers, and trained agricultural men are demanded for development work.

VOCATIONAL AGRICULTURAL TEACHERS. Federal aid for vocational agriculture in schools, especially high schools, has created a new demand for teachers in each state and this aid has provided attractive salaries for teachers.

COLLEGE POSITIONS. Students who have made good records and with practical experience are called into college positions as teachers, research and extension workers. Opportunities are many for such persons to do graduate work on part-time pay, fellowships or scholarships.

AGRICULTURAL PRESS. The field of agricultural journalism and advertising is a promising one which calls for increasing numbers of men and women with agricultural training.

RESEARCH BY COMMERCIAL INTERESTS. The agricultural graduate ready to do investigational work is in great demand in the business world as well as by state agricultural experiment stations and the United States Department of Agriculture.

FOREIGN SERVICE. We have calls from foreign countries for men as farm managers, teachers, and extension specialists and in commercial agricultural lines.

MISCELLANEOUS POSITIONS. Positions as college teachers, County Y. M. C. A. worker, drainage engineer, bacteriologist, soil surveyor, and manager of city milk supply, creamery, shipping associations, or other associations demand the agricultural college graduate. Prospective veterinarians may get fundamental courses and later transfer to a veterinary college. This field has great possilibities at the present time.

THE LONG COURSE (Four Years)

THE LONG COURSE IN AGRICULTURE is the one which most students take and is the course leading to the degree of Bachelor of Science (Agriculture). Four years of University work is required although the course may be taken in less than four years if summer sessions are attended. The more desirable commercial, managerial, and professional positions require this course as the minimum preparation.

PLAN OF COURSE

The Long Course serves a two-fold purpose; it gives a broad general training and furnishes specific technical knowledge of agriculture. It is hoped through this course to fit students to be useful to the highest degree in any line of agricultural effort and at the same time to be active in the uplift of their communities.

The curriculum contains the required subjects taken by all students in agricuture. The first two years are foundational and consist of 29 credits in the College of Letters & Science, 14 credits in specified courses in the College of Agriculture and 15 credits in selective courses dependent on the students

interests and probable major, and a few credits of free elective work. It is desirable that the student choose his major at the middle of the sophomore year. Delaying after that time will handicap the student in his major preparation. Part of the elective work of the sophomore year is dependent on choice of major.

GRADUATION REQUIREMENTS. A total of 133 credits and 133 grade points in addition four semesters of military drill or physical education taken during the freshman and sophomore years is required for graduation.

Two optional subjects as listed on page 9 are required. They must be chosen in two departments.

Students should select a major at the middle of the sophomore year to insure sufficient time to secure all requirements for the major.

A minimum of fifteen elective credits in a chosen department shall constitute a major, except that courses in other departments and colleges may, on approval of the Agricultural faculty, and when printed in the circular be counted towards a major.

A thesis is required as a portion of the major in certain cases and must consist of four credits. See page 7.

No student shall take more than 25 elective credits including Thesis in any one department.

A minimum of 10 elective credits must be taken outside the College of Agriculture. Five of these credits shall be in English, Philosophy, Psychology, Sociology, Political Science, History or language (French, German, Italian, Spanish).

Students except during the first semester of the freshman year when a minimum of 14 credits may be taken, must take at least 16 and not more than 18 credits each semester, exclusive of drill, convocation and physical education, unless they secure special permission from the Executive Committee of Class Advisers to vary from the rule. This applies to seniors regardless of the number of credits remaining to complete the requirements for graduation.

A student who has received a standing of at least B in each subject of a regular schedule for the preceding semester may carry a maximum of 20 credits without Executive Committee action.

No student who does not earn at least one grade-point per credit during the last two semesters of his attendance at the University will be recommended for a degree.

Each student shall have farm experience satisfactory to the department in which he majors.

Convocation is not required of students who enter the second semester and complete a semester's work and of those who enter with one semester of work taken in some other collegiate institution.

POINTS. A system of points is in operation for all students in the University of Wisconsin. Graduation from the Long Course in Agriculture requires 133 grade points, and they are awarded on the following basis:

For grade A, excellent, three points for each hour of credit.

For grade B, good, two points for each hour of credit.

For grade C, fair, one point for each hour of credit.

For grade D, poor, credit but no points.

It is evident that an average grade of Fair (C) is required for graduation. If a student by reason of grades of Poor falls behind in the required number of points, he is ineligible for graduation. By the use of the point system the student may readily determine the quality of progress he is making in the course.

PHYSICAL EDUCATION—MILITARY TRAINING. Evey male freshman and sophomore is required to take three hours' work a week in either physical education or military science for a total of four semesters. The student shall express his choice between these alternatives when filling out his semester election card. Freshmen and sophomores who take Military Drill are furnished a uniform by the University. A deposit of $10.00 must be made which may be returned when equipment is returned, subject to regulations of the military department.

FARM EXPERIENCE. Before graduation from the four year or two year courses, a student must have had farm experience satisfactory to the department in which he majors. Students who have had little or no farm experience before entering college may find it to their advantage to drop out one year during their course in order to secure 12 months consecutive farm experience on some good farm. A good time to do this is at the close of the first semester. At this time the student can get in touch with the winter and spring farm work and become accustomed to the work before the severe spring and summer work begins.

FRESHMAN CONVOCATIONS are held regularly to give students an opportunity to hear talks of special interest to freshmen. Attendance upon these convocations is required of all freshmen except those who enter with one semester of work completed in some other collegiate institution or enter this college the second semester and complete that semester of work.

THESIS REQUIREMENT. Students in the four year course in agriculture

A TYPICAL SCIENTIFIC LABORATORY
Our many laboratories are in constant use by students or for research.

whose grade points at the beginning of the senior year are 50 per cent more than the number of credits obtained in the various courses which have been taken shall be required to write a thesis. Students whose grade points are less than 50 per cent more than the number of credits obtained may write a thesis only upon the recommendation of the adviser and the permission of the agricultural faculty. The thesis shall be four credits.

LONG COURSE IN AGRICULTURE

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Chem. 1a—General chemistry	5	Chem. 1b—Qualitative analysis	5
Math. 71—Mathematics for agricultural students	4	Botany 1—General botany	5
An. Husb. 1—Elem. livestock judging, or	3	Agron. 1—General farm crops	3
Agron. 1—General farm crops	(3)	or	
Convocation	0	An. Husb. 1—Elem. livestock judging	(3)
Physical activity requirement	0	Physical activity requirement	0
	15		16

Students will elect their animal husbandry or agronomy in the first semester and the alternative subject in the second semester. Upon approval of the Executive Committee, a student may substitute for Mathematics 71 some other course in mathematics.

SOPHOMORE YEAR

Agr. Bact. 1—General survey	5		Agr. Econ. 1—Prin. of Agr. Econ.	3
Soils 1—Soil fertility	5	—or—	Agr. Chem. 1 & 2—Agr. Chem. and analysis	5
Econ. 1a—General economics	4		Agricultural option	3
Agricultural option	3		Botany 146, Physiology 3 or substitute	4
Electives	1-6		Electives	1-8
Physical activity requirement	0		Physical activity requirement	0
	16-18			16-18

Students majoring in the following departments will take the following subjects instead of Botany 146 or Physiology 3:

Agricultural Economics, Rural Sociology, Dairy Husbandry—Economics 1b.
Agricultural Journalism—Agricultural Economics 25.
Agricultural Engineering—Advanced mathematics.
Agricultural Education—Three cr. in the Department of Education.

JUNIOR YEAR

Science or Mathematics	5	Science or Mathematics	5
Electives in College of Letters & Science	5	Electives in College of Letters & Science	5
Major and electives	6-8	Major and electives	6-8
	16-18		16-18

SENIOR YEAR

Major and electives 16-18	Major and electives 16-18

The ten credits of chemistry, zoology, physics, geology, geography, botany, physiology or mathematics in addition to that of the freshman year, as shown in the junior year, are taken outside the College of Agriculture, and are to be fundamental to the major.

The 10 credits of electives in the College of Letters & Science shall include a minimum of 5 credits in language (German, French, Italian, Spanish), English, philosophy, psychology, sociology, political science or history.

Each student shall complete a minimum of 50 credits in the College of Agriculture, including required agricultural courses, options, majors and electives.

The major consists of a minimum of 15 or a maximum of 25 elective credits in a department, but certain courses outside a given department may be counted in the major if reported in advance to the faculty. A thesis, if required, must represent some phase of the students work in the field of his major, for which a total of 4 credits will be allowed.

AGRICULTURAL OPTIONS

Freshmen in the Middle Course and sophomores in the Long Course must choose two courses from the following group. Only one subject in a given department can be counted as an option in meeting this requirement, but subjects not chosen as options may later be taken as electives.

Agr. Engr. 1—Land surveying and drainage	3
Hort. 1—Principles of fruit growing.....	3
Poultry 1—Poultry raising	3
Vet. Sci. 1—The animal body.....	3
Dairy 1—Introduction to dairying.....	3
Hort. 3—Vegetable gardening	3
Econ. Ent. 1—Farm insects	3
Agr. Engr. 5—Farm field machinery....	3

SAMPLES OF MAJOR CURRICULA IN AGRICULTURE

At the Wisconsin College of Agriculture we have a single curriculum of minimum requirements and the student selects with the advice of the major professor, the subjects which point to a major objective. Such objectives may be preparation as a high school teacher of agriculture, marketing adviser, county agricultural agent, agricultural chemist along plant or animal lines, agricultural journalist, agricultural engineer, landscape designer, plant operator for dairy manufacturing, farming, or any one of over a hundred different types of positions in agriculture. The earlier the objective is determined the better the chances are for a well balanced training for the future.

It is apparent that curricula cannot be printed for all objectives. Some colleges print group arrangements for each department. Several samples are given of how the curriculum at Wisconsin may be adapted to meet the student's objective. The three groupings found on pages 10 to 13 are representative of objectives in three departments. Curricula are in mimeograph form for technical agricultural engineer, landscape designer, dairy machinery engineer, agricultural journalist, and others. You are asked to write Assistant Dean J. A. James for suggestive groupings to meet your needs.

CURRICULUM FOR AGRICULTURAL CHEMISTRY

The following grouping of courses is typical of a major in Agricultural Chemistry arranged for a student interested in animal nutrition. Were the student interested in Plant Chemistry there would be slight changes in the courses of the department of Agricultural Chemistry. Most persons who complete this curriculum would be interested in a commercial or educational position in teaching or research and would continue graduate work for advanced degrees.

FRESHMAN YEAR

All subjects required—see freshman year on page 8

SOPHOMORE YEAR

First Semester	Credits	Second Semester	Credits
Economics 1a—General economics	4	Agr. Econ. 1—Principles of agricultural economics	3
Agr. Bact. 1—General survey	5	Agr. Chem. 1 & 2—Agr. analysis	5
Vet. Science 1—The animal body	3	Dairy 1—Introduction to dairying	3
Chemistry 11—Quantative analysis	5	Physiology 3—Animal physiology or Botany 146—Plant physiology	4
		Agricultural electives	3
Phys. Ed., Drill or Band	0	Phys. Ed., Drill or Band	0
	17		18

JUNIOR YEAR

Chem. 120, 121—Organic chemistry	5	Chem. 120, 121—Organic chemistry	5
German or French	4	German or French	4
Agr. Chem. 121—Dairy chemistry	5	Math. 2—Trigonometry	4
Agricultural Electives	2	Agricultural electives	4
	16		17

SENIOR YEAR

Chem. 130, 131—Physical chemistry	5	Chem. 130, 131—Physical chemistry	5
Agr. Chem. 122—Animal chemistry	5	Electives	8
Chem. 10—Mathematical chemistry	3	Agr. Chem. 233—Seminary	1
Agr. Chem. 233—Seminary	1	Agr. Chem. 100—Thesis	2
Agr. Chem. 100—Thesis	2		
Electives	2		
	18		16

VOCATIONAL AGRICULTURAL TEACHERS OR AGRICULTURAL EXTENSION WORKERS

The teacher of agriculture in high school and the county agricultural agent require very similar preparation in technical subject matter. The Extension Department prefers men as county agricultural agents who have been successful in high school teaching. The following contains all requirements as shown on page 8, the fifteen credits required for the University Teachers Certificate and a minimum of additional agricultural electives necessary to properly prepare for the teaching of agriculture in high school. The person completing this curriculum will receive the degree Bachelor of Science (Agriculture and Education). See discussion in the Department of Agricultural Education on page 30 of this circular.

FRESHMAN YEAR

First Semester — Second Semester

All subjects required—see freshman year on page 8

SOPHOMORE YEAR

First Semester		Second Semester	
Economics 1a—Gen'l economics	4	Agr. Econ. 1—Prin. of agr. econ	3
Soils 1—Prin. of soil fertility	5	Econ. Ento. 1—Farm insects	3
Agr. Bact. 1—Gen'l survey of bacteriology	5	Education 31—Prin. of secondary education	3
Poultry 1—Poultry raising	3	Dairy 1—Introduction to dairying	3
Phys. Ed., Drill or Band	0	Physics 61—General physics	5
	17	Phys. Ed., Drill or Band	0
			17

JUNIOR YEAR

First Semester		Second Semester	
Education 75—Psychology & practice of teaching	5	Agr. Education 1—Rural education	2
Agr. Engr. 3—Gas engines	3	Agr. Economics 128—Marketing of farm products	3
An. Husb. 126—Livestock feeding	4	Agr. Engineering 5—Farm field machinery	3
Horticulture 1—Prin. of fruit growing	3	Animal Husbandry 133—Dairy cattle & milk production	3
Zoology 3—Elementary zoology	3*	Electives	7*
	18		18

SENIOR YEAR

First Semester		Second Semester	
Agr. Education 302—Teaching agriculture	3	Agr. Education 301—Program building in vocational agriculture	2
Agr. Journalism 1—Writing farm news	3	Agr. Engineering 8—Domestic engineering & practice	2
Agronomy 121—Grain production and crop judging	3	Agr. Economics 10—Farm organization and management	3
Agr. Education 5, 100 or 103	2	Agr. Education 110, 103 or 100	2
Electives	5*	Electives	7*
	16		16

*—At least two credits must be chosen in science such as Physiology 3, Botany 146, Chemistry 11 or some other science taught in the College of Letters

& Science. Ten more Letters and Science electives shall be chosen of which 5 credits must be in Philosophy, Psychology, English, Sociology, History, Political Science, or Language.

DAIRY MANUFACTURING

The curriculum typical of a dairy objective is given for the student interested in becoming a research worker or dairy plant laboratory technologist. Others are available in mimeograph form for those interested in the dairy engineering or business phases of the dairy industry.

FRESHMAN YEAR

All subjects required—see freshman year on page 8

SOPHOMORE YEAR

	Credits
Economics 1a—General economics	4
Veterinary Science 1—The animal body or Poultry 1—Poultry raising	3
Agr. Bact. 1—General survey of bacteriology	5
Chemistry 120, 121—Organic chemistry.	5
	17

	Credits
Agr. Economics 1—Principles of agricultural economics	3
Dairy Husbandry 1—Introduction to dairying	3
Agr. Chem. 1 and 2	5
Economics 1b—General economics or Physiology 3—Animal physiology	4
Electives (A)	3-2
	17-18

JUNIOR YEAR

Agr. Chem. 121—Dairy chemistry	5
Dairy Husbandry 3—Creamery operation & management	3
Electives (A)	7-8
Electives (B)	2-3
	17-18

Agr. Bact. 121—Dairy bacteriology	3
Dairy Husbandry 8—Dairy mechanics	3
Dairy Husbandry 124—Physical chemistry of dairy products	3
Electives (B)	7-8
	16-17

SENIOR YEAR

Dairy Husbandry 4—Cheese-making	4
Dairy Husbandry 5—City milk supply and ice cream making	3
Dairy Husbandry 123—Seminary	1
Electives (C & D)	9
	17

Dair Husbandry 121—Advanced dairy manufacturing problems	3
Dairy Husbandry 123—Seminary	1
Electives (C-D)	13
	17

(A) Ten credits of electives in the College of Letters & Science of which 5 credits shall be in English, Philosophy, Psychology, Sociology, History, Political Science or Language and remainder may be from Group D on page 13.

(B) Five additional elective credits are required in science or mathematics. Suggested courses are Physics 1a—5 cr., Math. 51 and 52, Geography 106, or Chemistry 130.

(C) These electives in the College of Agriculfure are desirable for the person desiring additional agricultural courses related to dairy manufacturing.

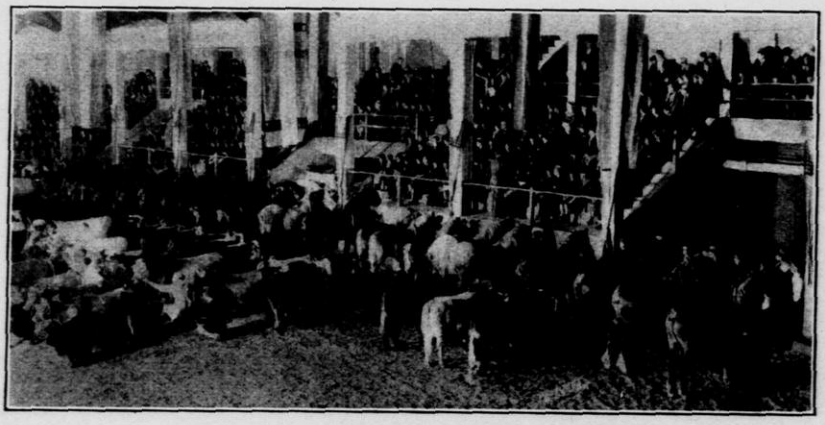
	Credits
Agr. Bact. 126—Physiology of bacteria.	3
Agr. Bact. 130—Determinative bacteriology	2-3
Agr. Econ. 127—Cooperative marketing.	2
Agr. Econ. 128—Marketing of farm products	3
Agr. Educ. 1—Rural education	2
Agr. Engineering 3—Gas engines	3
Agr. Journ. 1—Writing farm news	3
Animal Husb. 126—Livestock feeding	4
Animal Husbandry 133—Dairy cattle and milk production	3
Library 1—Library practice	1
Poultry husbandry	2

(D) These courses are fundamental training in business and are advised for students looking toward commercial careers. All 30 credits may be taken if elections are not from group C—above.

	Credits
Econ. 5—Money and banking	3
Econ. 8a—Elements of accounting	3
Econ. 8b—Elements of accounting	3
Econ. 11—Business management	2
Econ. 13—Marketing methods	3
Econ. 14—Sales administration	2
Econ. 15—Principles of advertising	2
Econ. 17—Merchandising	2
Econ. 171—Personnel management	3
Econ. 154—Risk and profit	3
Commercial law	2
Speech 7—Public speaking	2

The Wisconsin Curriculum has advantages over many others. Of the 133 credits required for graduation, 29 credits are in the College of Letters and Science and 16 credits of specified courses in the College of Agriculture. There are 35 credits of fundamental work that are chosen with few limitations according to the student's interest and the remaining 50 credits are electives of the major grouping or student's interest.

The three type or sample curricula are illustrative of the elasticity of our curriculum in meeting your objective. A hundred others could be arranged meeting our graduation requirements as shown on page 8.



THE WISCONSIN LITTLE INTERNATIONAL

During the Farmer's Week the students hold a livestock show and have a fine entertainment for our visitors.

THE MIDDLE COURSE

LEADING TO THE TITLE OF GRADUATE IN AGRICULTURE

This course is designed to meet the needs of students who have had a high school training but who cannot spend more than two years at the university. Requirements for admission are the same as for the Long Course.

The total requirements for graduation in the Middle Course are 64 credits and 64 grode-points. All Middle Course students are required to take convocation and two full years of physical education, military science, or band instruction.

A maximum of ten elective credits may be taken outside the College of Agriculture. Subjects of the Long Course taken in the College of Letters and Science and not required in the Middle Course are considered electives outside the College of Agriculture.

Students taking the Middle Course and desiring to transfer to the Long Course must be prepared to spend more than the usual four years in order to complete the requirements.

This course gives the maximum opportunity for choosing work for a vocational objective. Students should have an objective in mind when entering the course and plan their work so prerequisites may be taken for all courses desired. Early in the first semester the Assistant Dean should be consulted concerning objectives and future courses desired. Dairy manufacturing, poultry, animal husbandry, horticulure, or farm crops are usual fields of specialization, but others may be made.

FRESHMAN YEAR

	Credits		Credits
Engl. 1a—Freshman composition	3	English 1b—Freshman composition	3
Chemistry 1a—General chemistry	5	Chem. 1b—Qualitative analysis	5
Electives	6	Electives	8
Convocation	0	Physical activity requirement	0
Physical activity requirement	0		
	14		16

SOPHOMORE YEAR

Electives	17	Electives	17
Physical activity requirement	0	Physical activity requirement	0
	17		17

Russell Rebholz

Harold Rebholz

Milo Lubratovitch

Eldon M. Marple

Varsity Crew

Milo Lubratovich

Delmar Fink

Vernon Goldswarthy

Harold Rebholz

Myron Hales

McClure Thompson

A FEW AGRICULTURAL STUDENTS ARE ACTIVE IN ATHLETICS

ADMISSION TO THE LONG OR MIDDLE COURSES

The admission requirements for the long and middle courses in agriculture are the same as for the College of Letters and Science.

ENTRANCE REQUIREMENTS

Entrance requirements are stated in units of high-school work, a term which is not to be confused with the term *credit* as applied to university work. A unit represents five class periods a week in one branch of study for a school year of at least 36 weeks. Two laboratory periods in any science or vocational study are considered as equivalent to one class period. In closely allied subjects, such as botany and zoology, not usually taught throughout the entire year, units may be constructed by adding the respective time values of the subjects. Three periods a week for a year and a half may be counted as one unit.

GENERAL REQUIREMENTS

Fifteen units, distributed as follows, are the fundamental requirement for regular admission to any college or course in the University:

I. Two units of English are required of all entrants; three units are recommended for all and are required of those who do not offer two units of foreign language. One unit of algebra and one of geometry are also required of all, with an additional half or whole unit of algebra recommended for those interested in the technical agricultural engineering major.

II. Two units of science or history, or two units of one of the following foreign languages—French, German, Greek, Hebrew, Italian, Latin, Norse, or Spanish—must be presented by all. If foreign language is offered there must be at least two units in a single language, although in exceptional cases one unit may be offered as the optional subject.

III. The remaining units necessary to bring the total to fifteen must be offered from Groups A and B, with a maximum of four units from Group B and a total of not more than four units in any single subject.

GROUP A

	Units		Units		Units
English	1-2	History and Civics		Science	
Foreign language		History	1-4	Botany	½-1
French	1-4	Civics	½-1	Biology	1
German	1-4	Economics	½	Chemistry	1
Greek	1-3			General science	½-1
Hebrew	1-2	Mathematics		Geography	½-1
Italian	1-2	Advanced algebra	½-1	Physics	1
Latin	1-4	Solid geometry	½	Physiology	½
Norse	1-2	Trigonometry	½	Zoology	½-1
Spanish	1-4				

GROUP B

Agriculture	1-4	Mechanical drawing	1-4
Bookkeeping	½-2	Shop work	1-2
Commercial law	½	Shop work and drawing	1-4
Commercial arithmetic	½	Music	1-4

Commercial geography		½
Business organization	If taken in the junior or senior year	½
Office practice		½
Salesmanship		½
Shorthand		2
Typewriting (only ½ unit if not combined with shorthand		½-1
Domestic art		1-2
Domestic science		1-2
Drawing, art, and design		1-4
History and appreciation		1
Theory and harmony*		2
Choral music		½-1
Orchestra		½-2
Band		½-2
Applied music		½-2
Optional (not including drill subjects such as penmanship, physical education, or military training)		½-1

*Not less than 2 units accepted.

FRESHMAN PERIOD

All freshmen are required to be present at the University on the Wednesday preceding the beginning of instruction in September 1931 and to remain throughout the week. This period (September 16-22) will be devoted to registration, conferences with advisers, physical examinations, aptitude tests, special educational examinations, assignments to classes, lectures and discussions on subjects of importance to new students, and a general introduction to university life.

Because attendance throughout the entire period is required, it is essential that all details connected with admission be attended to as early as possible. Students who graduate from high schools or academies in June should inform their principals sometime in May or early June of their intention to attend the University in the fall, so that the necessary certificates may be prepared and other important data furnished to university authorities.

Rooms for the semester should be secured in advance of Freshman Period so that there will be no confusion, uncertainty, or waste of time during the days when attention should be centered on "getting started."

METHODS FOR ADMISSION

There are four methods for admission to the College of Agriculture for the Long or Middle Course as follows:

ADMISSION UPON CERTIFICATE. Graduates of accredited high schools may enter the University without examination on the presentation of a certificate showing the satisfactory completion of fifteen required units and containing the recommendation of principal. Forms of such certificates, prepared by the University, must be used, and may be obtained from the Registrar. These certificates should be sent to the University before August 1.

Graduates of four-year non-accredited schools in Wisconsin will be admitted without examination but on probation, upon the favorable recommendation of the principal, providing the graduate has fully and satisfactorily covered in his high school course the full requirements for admission to the University.

EXAMINATION. There are two regular entrance examinations of the University. For dates see the calendar on page 2.

All candidates must be present at 9 o'clock on the first day of the examination. No special examinations are given.

Candidates for admission to the University may divide the subjects and take the examinations in two trials; but a failure to pass all of the subjects in the two trials will necessitate a complete re-examination. For the character of the entrance examination, see University catalog.

ADULT SPECIAL STUDENTS. Persons 21 years old who do not possess all the requirements for admission and are not candidates for a degree, may be permitted to enter the College of Agriculture upon giving satisfactory evidence to the registrar of the University that they are prepared to take advantageously the studies which they desire. Students are generally allowed to select their studies only from the courses open to freshmen. Exceptions are permitted by the Executive Committee of the College of Agriculture upon satisfactory grounds, but the student must show special preparation and special necessity for the exception.

Candidates applying for admission on this basis are required to present a detailed statement of their preparatory studies at the time of their admission and to meet all entrance requirements before the expiration of two years of resident study.

Adult special students who desire subsequently to become candidates for a degree must satisfy the regular entrance requirements before beginning the work of the junior year. *The term "Adult Special" applies to entrance and does not grant special privileges in selection of subjects.*

ADMISSION FROM UNIVERSITIES, COLLEGES, NORMALS, ETC. The College of Agriculture will give credit for work taken at other institutions where such work corresponds with the requirements of the agricultural courses. Evidence must be presented showing sufficient entrance units before advanced credits will be considered.

Transcripts should be sent to Assistant Dean J. A. James before September first if possible. A satisfactory scholastic record and honorable dismissal are required.

SCHOOLS OUTSIDE WISCONSIN. Graduates of secondary schools outside Wisconsin will be admitted when recommended and certified by the principal, provided the minimum entrance requirements are met. Work submitted to be satisfactory for entrance shall be interpreted to mean an average standing of "good." This applies to schools of the North Central Association or of a school maintained on the basis of regular inspection accredited relationship with the state university or other university incuded in the membership of the Association of American Universities.

Credentials properly certified by the principal on forms provided by the University should be submitted for approval by the University before August 1.

ADVANCED CREDIT for high school work may be granted to students with satisfactory average standings presenting more than 15 units accepted for admission, provided: (1) the subjects in which advanced credit is sought are the general subjects accepted for admission to the University; (2) the work is as advanced as work given in the freshman year; (3) the student's course of study in which credit is desired be approved by the chairman of the department and (4) the students pass a satisfactory examination at least two hours in length, held at the University before or during the Christmas recess. No advanced credit will be given for work in language unless it be in excess of six units of language offered for admission, nor will advanced credit be given for less than three semester hours.

Any student who believes he had in the secondary school the equivalent of any required course in the Agricultural College, may apply for examination in the course. If the examination be satisfactory to the department,

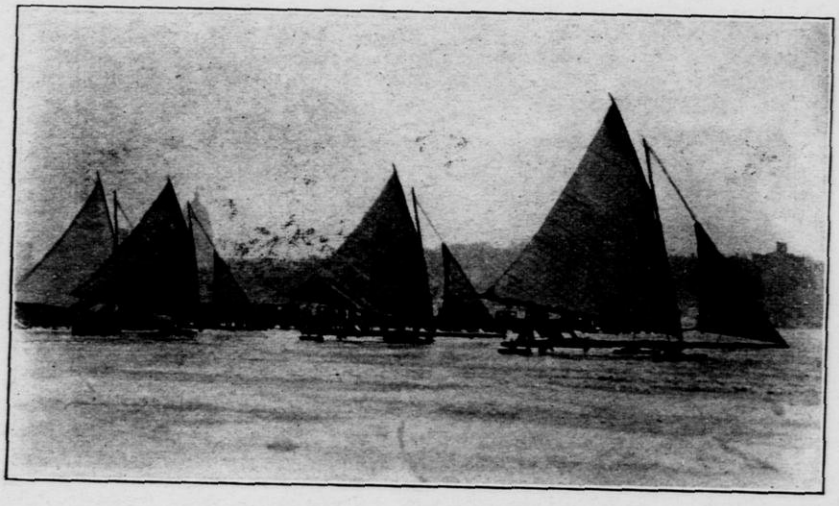
exemption from the course is granted without reducing the number of credits for graduation.

STUDIES BY CORRESPONDENCE. No purely agricultural courses are given by correspondence. Courses which are required of students in the College of Agriculture, such as English, Mathematics, Botany, and electives in the College of Letters and Science, may be taken by correspondence and where such work is satisfactorily performed may be applied on the courses. For further information address University Extension Department.

FEES AND EXPENSES

The largest expense of the student is for board and room. Rooms can be obtained in student rooming houses and private residences in the city at prices ranging from $2 to $5 a week for each student. The average price is $3 a week. Board in clubs, private families, and cafeterias ranges from $5 to $8 a week. Many students partly support themselves by assisting at boarding houses or by doing other kinds of work that do not conflict with their studies.

The cost of text books, stationery, locker fees, athletic suits, and so forth is from $25 to $40 a year.



ICE BOATING ON LAKE MENDOTA
Winter sports such as ice boating, tobogganning, skiing, and skating are popular with university students.

An incidental fee of $21.50 a semester is charged each student. This includes a fee for medical attention, as explained on page ..... Non-residents of Wisconsin pay a tuition fee of $100 a semester in addition to this incidental fee. An additional fee of $3 is charged students who pay their fees after the regular registration days (see calendar). The Bursar shall refuse to accept fees from any student who does not pay promptly after his registration card is issued. The University reserves the right to alter these charges without further notice.

Laboratory fees for required courses taken in the College of Letters and

Science are as follows. In all courses there is a possible refund at the end of the semester, depending on the amount of breakage in the laboratory.

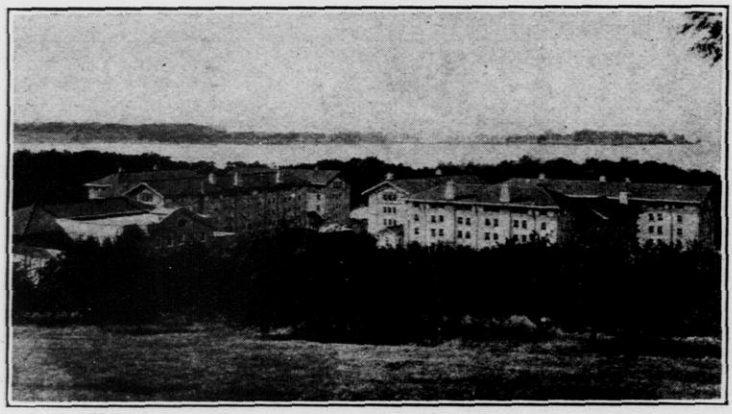
Chemistry 1 (each semester)	$17.50	Botany 146	$ 5.00
Physics 61	7.00	Physiology 3	3.00
Botany 1	5.00	Chemistry 12	20.00
Zoology 3	5.00		

When elective courses are taken laboratory fees vary according to courses taken.

Graduate students pay the same fees as undergraduate students. Fellows, scholars, and student assistants are required to pay the regular laboratory fees, but instructors and assistants are exempt, in their own department.

Freshman or sophomore students who take military drill are furnished a uniform by the University. A deposit of $10 must be made subject to regulations of the Military Department.

A study of the above shows that a freshman has laboratory fees of approximately $35, and incidental fee of $21.50 for each semester and also military uniform deposit of $10 for the first semester.



THE BOYS' DORMITORY NEAR AGRICULTURAL HALL

FINANCIAL HELP FOR STUDENTS

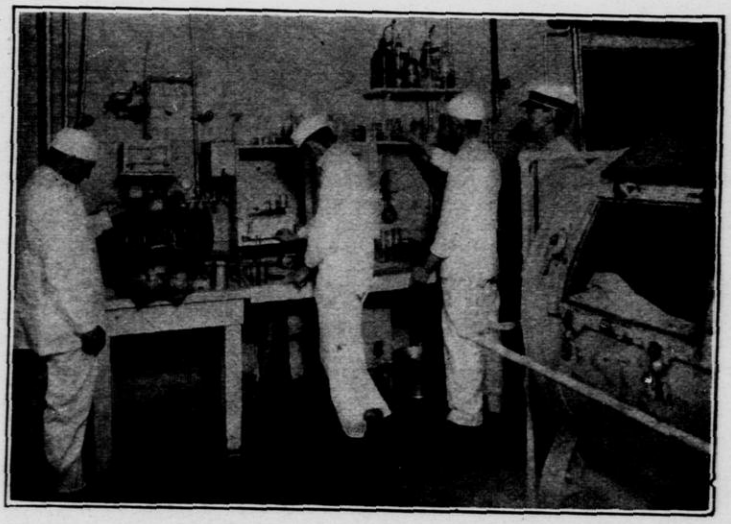
The University has made provision for a limited amount of financial help for needy students. While every possible assistance is rendered self-supporting students of the College of Agriculture they are advised not to enter the University without some available funds. Students of the College of Agriculture are urged to make use of the following suggestions and apply to proper persons.

Opportunity for Work While Taking the College Course. Many students help to pay the expense of their college course by waiting on tables, tending furnaces, restaurant work, dish washing, work in private homes, clerical, canvassing, etc. The University operates an employment bureau which endeavors to secure satisfactory employment for worthy students. Students desiring work should write the Student Employment Office, Administration Building, University of Wisconsin, Madison, and receive application blanks

and detailed information about student employment in Madison. They should arrive in Madison a few days ahead of registration to get work that may be available. As places of employment are eagerly sought for and cannot always be obtained at once, those dependent upon themselves for support should not come to the University unless they have reserve funds for use until employment is obtained.

STUDENT LOAN FUND. There is a fund of nearly $2,000 which is available to all students in the College of Agriculture. This fund is to be loaned to needy students, in small amounts without interest, for short time loans. The money is to be returned from the first available earnings of the student. If the note is not paid at maturity, 6 per cent interest will be charged from the date of maturity until payment is made. Apply to Assistant Dean J. A. James.

FRESHMAN SCHOLARSHIPS. Five scholarships of $100.00 each will be awarded to freshmen in the Agricultural courses who are residents of Wisconsin. An essay on an assigned topic must be presented together with certain references, before August 15, 1931. For further information write Assistant Dean J. A. James, College of Agriculture, Madison, Wisconsin.



MAKING BUTTER AT THE CREAMERY

Students have opportunity for the best of experience in the college creamery, where butter, cheese and ice cream making and handling city milk problems are met.

WISCONSIN LEGISLATIVE SCHOLARSHIPS. The Regents of the University remit the tuition to a number of needy and worthy non-resident students upon the basis of scholastic attainment. Apply to Assistant Dean J. A. James during the second semester and before March 1.

WISCONSIN SCHOLARSHIPS. Students who are residents of Wisconsin and who are attending the University for their first year of residence and are in need of financial assistant should apply to Assistant J. A. James, who represents the agricultural college on the University committee which awards 50 Wisconsin scholarships of $100 each. Applications should be made near

the close of the first semester and before the opening of the second semester.

FELLOWSHIPS AND SCHOLARSHIPS. Ten fellowships and two scholarships, are offered graduate students in this college. These are granted to those candidates best fitted for the work selected. The fellowships return $600 a year and the scholarships $250 a year. Application for these honors must be made to the Registrar of the University on proper forms on or before Feb. 15.

AGRICULTURAL STUDENT ORGANIZATIONS

Several societies, maintained by the agricultural students, meet at intervals to discuss questions related to their special interests. The following list will give an idea of the nature of the various clubs and societies.

ALPHA ZETA. A chapter of the national honorary agricultural fraternity is maintained by faculty and student members.

THE COUNTRY MAGAZINE is a student magazine published monthly by students in the college.

THE SADDLE AND SIRLOIN CLUB is an organization of students interested in animal husbandry. The "Wisconsin International" is a phase of this work and their support is given to the Stock Judging Teams which represent the agricultural college at the International Livestock Show and the National Dairy Show.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS (Student Branch). This organization meets every two weeks and students report on agricultural engineering topics. Special lecturers appear three or four times each semester. Students take charge of an "exhibition night" once each year.

BLUE SHIELD consists of a group of students interested in rural organization work. Its programs prepare the men in spirit, mind, and body to become rural workers and leaders particularly in community work.

HONORS IN THE COLLEGE OF AGRICULTURE

Honors and high honors are awarded at the end of the sophomore year and at graduation upon the number of grade points earned.

SOPHOMORE HONORS AND SOPHOMORE HIGH HONORS are awarded on the basis of a minimum of two full years of work acquired in residence. The student averages two and one-quarter grade points per credit to secure honors, and two and three-quarters grade points per credit to secure high honors. Adjustments are made when students carry more than the regular schedule.

In 1930 the following Long Course students were awarded Sophomore Honors:

SOPHOMORE HONORS

Honors

Larson, Olaf F.
Lilly, John
Quackenbush, Forrest
Schroeder, Erwin

SENIOR HONORS AND SENIOR HIGH HONORS are awarded at the completion of at least two full years of work, acquired in residence, after the completion of sophomore work. The student must average two and one-quarter grade points per credit to secure honors.

The following were granted at Commencement in June, 1930.

SENIOR HONORS

Honors

Burkhardt, Martin J., Jr.
Callenbach, John A., Jr.
Fincher, Emmett J.
Lurvey, Clayton P.
Mitchell, Mark H.
Nichols, John L.
Sell, Otto E.
Zurbuch, Alfred A.

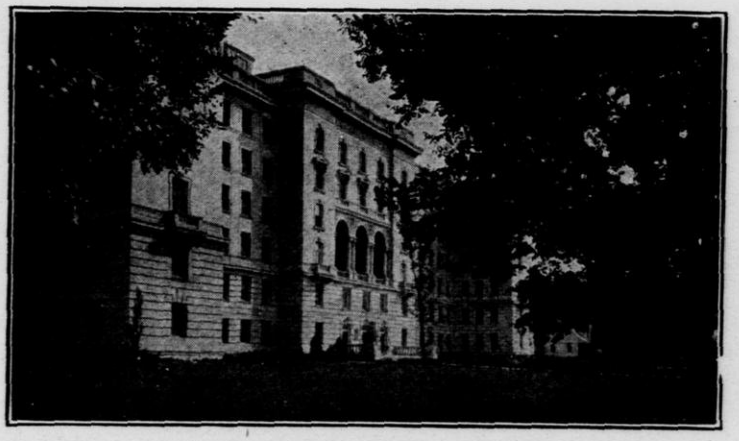
STUDENT HEALTH

The Department of Clinical Medicine has general supervision of the health of the students. It aims to determine the medical fitness of each student, to study the intricate problems of the relation of health to higher education, and to prevent disease among the students.

MEDICAL EXAMINATIONS. Students entering the University for the first time undergo a careful medical examination to determine their fitness for university work. An appointment for medical examination is made at the time of registration. Records of the results of these examinations are kept in the office of the Department of Clinical Medicine for future reference in the supervision of the mental and physical development of the student. The Medical Adviser's Office is established for the general supervision of students needing medical attention. All cases of student illness should be promptly reported to the office whether or not professional service is desired.

Conditions affecting the general welfare of the University community are treated by the members of the staff, but students requiring special care—major surgery, treatment of the eyes, ears, x-rays, and so forth, are referred to specialists.

A modern and completely equipped infirmary is maintained by the University for the care of students requiring medical and surgical treatment and for the isolation of those suffering from communicable diseases. Cases requiring special methods of study and treatment are cared for by the University medical staff in the Wisconsin General Hospital erected in gratitude by the people of the state.



GUARDIAN OF STUDENT HEALTH

To provide the best medical and hospital care the university has this institution—the Wisconsin Memorial Hospital where the students go for medical attention.

DEPARTMENTS OF INSTRUCTION

Abbreviations in the announcement of courses:

Yr.—course continues throughout the year

I—given during the first semester

II—given during the second semester

I and II—repeated each semester. If used with Yr., means course may be begun first or second semester

cr.—credits, i e., hours of credits. Unless otherwise stated, the number of credits per semester is given.

AGRICULTURAL BACTERIOLOGY

EDWIN GEORGE HASTINGS, M.S., *Professor of Agricultural Bacteriology, Chairman*
EDWIN BROWN FRED, Ph.D., *Professor of Agricultural Bacteriology*
WILLIAM DODGE FROST, Ph.D., D.P.H., *Professor of Agricultural Bacteriology*
IRA LAWRENCE BALDWIN, Ph.D., *Associate Professor of Agricultural Bacteriology*
ELIZABETH MCCOY, Ph.D., *Assistant Professor of Agricultural Bacteriology*
MILDRED A. ENGELBRECHT, M.S., *Instructor in Agricultural Bacteriology*
HARRY E. SAGEN, M.S., *Instructor in Agricultural Bacteriology*

Students majoring in this department may take Medical Bacteriology 102 or 104 or Veterinary Science 126, and count five of these credits toward the major requirement.

1. GENERAL SURVEY OF BACTERIOLOGY. I; 5 cr. The relation of micro-organisms to soil fertility, to animal diseases, and to food. Prerequisite: Chemistry 1a. Required of all agricultural students. Lab. fee $6.75. Mr. Baldwin, Mr. Sagen.

2. GENERAL SURVEY. II; 4 cr. The relation of micro-organisms to chemical transformations, especially as regards their relation to water, food, sewage disposal, and industrial processes. For chemistry course students. Prerequisite: Chemistry 1b. Lab. fee $6.75. Mr. Baldwin, Mr. Sagen.

4. GENERAL SURVEY. II; 5 cr. Survey of bacteriology with special emphasis on the relation of micro-organisms to foods and domestic sanitation. One out-of-town class trip taken. Prerequisite: Chemistry 1a. Required of students in home economics. Lab. fee $6.75. Mr. Frost, Miss Engelbrecht.

100. THESIS. Yr; 2 cr. A definite problem in dairy, soil, or household bacteriology or in animal diseases. Prerequisites: Agr. Bact. 1, 2, or 4, and consent of instructor. Lab. fee $2.25 per lab. cr. Staff.

121. DAIRY BACTERIOLOGY. II; 3 cr. The bacteriology of milk production and distribution and of dairy manufacturing. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee $4.50. Mr. Hastings.

123. SOIL BACTERIOLOGY. II; 3 cr. The relation of micro-organisms to soil fertility. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee $4.50. Mr. Fred.

126. PHYSIOLOGY OF BACTERIA. I; 3 cr. The chemistry and physics of bacterial processes. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee $4.50. Mr. Baldwin, Mr. Allen.

130. DETERMINATIVE BACTERIOLOGY. Yr.; 2-5 cr. Training in the common methods of the bacteriological laboratory. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee $2.25 per lab. cr. Mr. Frost, Miss Engelbrecht.

200. RESEARCH. Yr; 2-5 cr. A detailed study of a definite problem in the field of agricultural bacteriology. Prerequisites: Agr. Bact. 121, and 123, 124, 125, or 130. Lab. fee $2.25 per lab. cr. Staff.

231. SEMINARY. Yr; 1 cr. Discussion of the research work of the department and of current problems in the fields covered by the department. Staff.

AGRICULTURAL CHEMISTRY

STEPHEN MOULTON BABCOCK, Ph.D., LL.D., Sc.D., *Professor of Agricultural Chemistry, Emeritus.*
EDWIN BRET HART, B.S., *Professor of Agricultural Chemistry, Chairman*
WILLIAM HAROLD PETERSON, Ph.D., *Professor of Agricultural Chemistry*
HARRY STEENBOCK, Ph.D., *Professor of Agricultural Chemistry*
WILLIAM EDWARD TOTTINGHAM, Ph.D., *Associate Professor of Agricultural Chemistry*
KARL PAUL LINK, Ph.D., *Associate Professor of Agricultural Chemistry*
CONRAD ARNOLD ELVEHJEM, Ph.D., *Assistant Professor of Agricultural Chemistry*
SEYMOUR WILLIAM FREDERICK KLETZIEN, Ph.D., *Instructor in Agricultural Chemistry*
BLANCHE MARYE RIISING, B.S., *Instructor in Agricultural Chemistry*
HENRY THOMAS SCOTT, Ph.D., *Instructor in Agricultural Chemistry*

The courses offered in this department are intended to give a broad view of farm chemistry useful to the general agricultural student, and to develop men fitted for instructional or experimental work in the various fields of chemical activity applied to agriculture. Courses 120 and 122 are for students desiring a more detailed knowledge of the special subjects treated and are preliminary to greater specialization. These courses should be preceded or accompanied by work in biology and organic chemistry. Physiology and bacteriology are desired prerequisites. All other advanced courses in this department are open to undergraduates and graduates who have had the necessary preliminary training. For curriculum see page 10.

1. AGRICULTURAL CHEMISTRY. II; 3 cr. A general discussion of chemistry applied to the farm, including the chemistry of plants and animals and the processes involved in their growth. Prerequisite: Chemistry 1b or concurrent registration. Mr. Elvehjem.

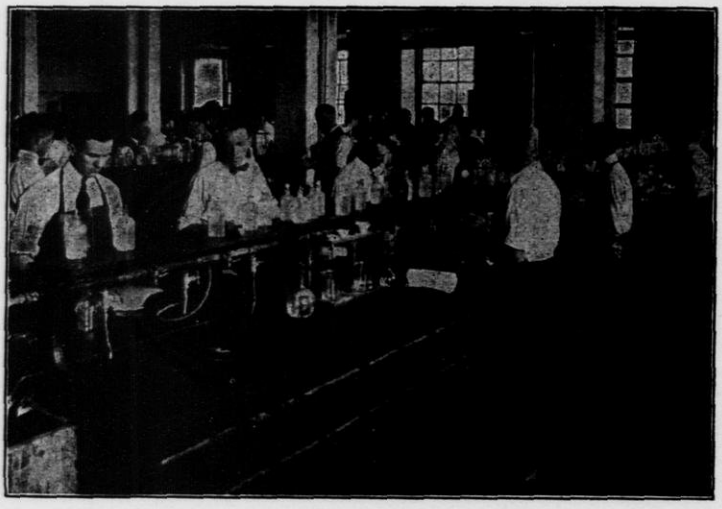
2. AGRICULTURAL ANALYSIS. II; 2 cr. Analytical chemistry applied to agricultural materials; quantitative analysis of soils, fertilizers, manures, feeding stuffs, and insecticides. Prerequisites: Chemistry 1b and 12. Lab. fee $4.50. Mr. Elvehjem.

3. HOUSEHOLD CHEMISTRY. I; 5 cr. The composition, physical properties, and nutritive value of foods; chemistry of the home, cleaning materials, dyes, etc. Required of all home economics students. Prerequisite: Chemistry 1b. Lab. fee $6.75. Mr. Peterson.

100. THESIS. Yr; 2 cr. May be taken in plant, animal, fermentation, or dairy chemistry. Lab. fee $2.25 per lab. cr. Staff.

120. PLANT CHEMISTRY. II; 2 or 5 cr. The mechanism and course of chemical processes in the growth of plants, including the effect of environmental factors. Selected methods for the determination of plant constituents. Prerequisites: Chemistry 1b and 120. Lab. fee $2.25 per lab. cr. Mr. Tottingham.

121. DAIRY CHEMISTRY. 1; 2 or 5 cr. The chemistry of milk and its products, including the chemistry of fermentation and detection of adulterants. Prerequisites: Chemistry 1, 12, and 120. Lab. fee $2.25 per lab. cr. Mr. Hart.



A CLASS IN AGRICULTURAL CHEMISTRY

Every opportunity is given the students to familiarize themselves with the science which has contributed much to the present development of agriculture.

122. ANIMAL CHEMISTRY. I; 2 or 5 cr. The chemistry of feeds, processes of digestion, use of nutrients, and metabolic changes involved in the nutrition of animals. Prerequisites: Chemistry 1, 12, and 120. Lab. fee $2.25 per lab. cr. Mr. Steenbock.

124. ADVANCED BIO-CHEMISTRY. I; 1-3 cr. A survey of important analytical processes used in the study of bio-chemical problems. Prerequisites: Chemistry 1, 12, 120, and Agr. Chem. 122. Lab. fee $2.25 per lab. cr. Mr. Elvehjem.

125. THE VITAMINS. II; 1-3 Cr. Lectures and laboratory work on the vitamins, including the animal technique used in their identification. Prerequisite: Agr. Chem. 122. Lab. fee $2.25 per lab. cr. Mr. Steenbock.

126. MODERN VIEWS OF ANIMAL NUTRITION AND THEIR APPLICATION. II; 2 cr. A course of lectures and conferences on the newer knowledge of nutrition applied to man, poultry, dairy cattle, swine, etc. Prerequisite: Agr. Chem. 122. Mr. Hart.

127. FERMENTATION BIO-CHEMISTRY. II; *cr. Lectures and laboratory work on the chemistry and bacteriology of fermentation. Lab. fee $2.25 per lab. cr. Mr. Peterson, Mr. Fred.

128. CARBOHYDRATE CHEMISTRY. II; *cr. Laboratory work with conferences on the chemistry of the carbohydrates. Includes a study of the properties and methods of separation and identification of the more important sugars. Lab. fee $2.25 per lab. cr. Mr. Link.

230. PLANT NUTRITION. Yr; *cr. The influences of fertilizers upon the development and composition of plants in field and pot experiments, including the effects of environmental factors. Prerequisite: Agr. Chem. 120. Lab. fee $2.25 per lab. cr. Mr. Tottingham.

231. ANIMAL NUTRITION. Yr; *cr. Composition and digestibility of foods and their influence upon growth, production of milk, etc. Prerequisite: Agr. Chem. 122. Lab. fee $2.25 per lab. cr. Mr. Hart, Mr. Steenbock, Mr. Elvehjem.

232. ADVANCED DAIRY CHEMISTRY. Yr; *cr. The proximate analysis of milk and its products, and a study of the changes which occur in the manufacture of dairy products. Prerequisites: Agr. Chem. 121. Lab. fee $2.25 per lab. cr. Mr. Hart.

233. SEMINARY. Yr; 1 cr. Original articles of importance are studied in detail, to broaden and deepen the understanding and to act as a stimulus to further research. Mr. Hart and staff.

AGRICULTURAL ECONOMICS

BENJAMIN HORACE HIBBARD, Ph.D., *Professor of Agricultural Economics, Chairman*
PRESTON ESSEX MCNALL, M.S., *Professor of Agricultural Economics*
GEORGE SIMON WEHRWEIN, Ph.D., *Professor of Agricultural Economics*
HENRY HARRISON BAKKEN, M.A., *Assistant Professor of Agricultural Economics*
RUDOLPH KNUGAARD FROKER, M.A., *Assistant Professor of Agricultural Economics*
ISAAC FULTS HALL., Ph.D., *Assistant Professor of Agricultural Economics*
A. CLAIRE HOFFMAN, M.S., *Assistant Professor of Agricultural Economics*
WILLIAM P. MORTENSON, M.S., *Assistant Professor of Agricultural Economics*
MARVIN ARNOLD SCHAARS, M.S., *Instructor in Agricultural Economics*
MILES CHARLES RILEY, LL.B., *Lecturer in Agricultural Economics*
JOHN SWEET DONALD, B.S., D.D.S., *Lecturer in Agricultural Economics*

The courses in agricultural economics are intended to give the students a knowledge of the economic principles which relate to the production and marketing of farm products, and to the economic conditions of the agricultural classes. As such, it is a field of general interest to all concerned with farmers and their welfare.

There are two methods of taking agricultural economics. First, it may be taken as a joint major along with work in one or more other departments, economics being recognized as a phase of farming coordinate with many other lines of inquiry; second, agricultural economics may be taken as a full major by those who decide to make it a main line of study preparatory to teaching, research, or work of an economic character. The major consists of 15 credits, including the thesis.

A curriculum in Agricultural Commerce is in mimeograph form. This gives a background in agricultural science as well as a training in economics and business practice. If interested write the chairman of the department.

1. PRINCIPLES OF AGRICULTURAL ECONOMICS. II; 3 cr. Application of economics to agriculture. Required of all agricultural students. Prerequisite: Economics 1a. **Mr. Hibbard.**

8. FARM RECORDS AND ACCOUNTS. II; 2 cr. Inventories, bookkeeping, and accounting principles as applied to farm operations. Mr. Mitchell.

10. FARM ORGANIZATION AND MANAGEMENT. II; 3 cr. Farm methods and practices as applied to business management on the farm. Prerequisite: Junior standing. Mr. McNall.

14. FARM BUSINESS AND LEGAL PRACTICE. II; 3 cr. Mr. Riley.

100. THESIS. Yr; 2 cr. Staff.

107. FARM COST ACCOUNTING. II; 2 cr. Systems of cost accounting in their application to the problems of farm organization and operation. Prerequisite: Agricultural Economics 8 or equivalent. Mr. McNall.

117. OUTLINES OF LAND ECONOMICS. I; 3 cr. This course undertakes to cover the theoretical principles underlying landed property, including the theories of rents, taxation and conservation, together with the leading facts of land utilization. Prerequisite: Economics 1a. Mr. Wehrwein.

126. INTERNATIONAL TRADE IN AGRICULTURAL PRODUCTS. II; 3 cr. Review of theories of international trade and foreign exchange; domestic and world markets and practices; world survey of population and agricultural production; history of foreign trade in agricultural products; analysis of commodities and countries; barriers to foreign trade. Prerequisite: Economics 1a. Mr. Schaars.

127. COOPERATIVE MARKERING. II; 3 cr. The economic and legal basis of farmers' marketing organizations, their historical and current development, organization set-up, scope and purpose, special problems, possibilities and limitations, progress and future. Prerequisites: a course in marketing or concurrent registration. Mr. Schaars.

SEMINARY GROUP IN AGRICULTURAL ECONOMICS
Problems of cooperation, marketing, farm management, farm credit and land tenure are of greatest importance to the nation.

128. MARKETING AGRICULTURAL PRODUCTS. 11; 3 cr. Development of Agricultural marketing; services, agencies, methods; emphasis on principles and practices; price factors; commodity exchanges; current marketing problems; governmental relations; weaknesses and suggestions for improvement. Prerequisite: Economics 1a. Mr. Schaars.

152. FARMER MOVEMENTS. I; 2 cr. A discussion of the great farmer movements, such as the Grange, the Alliance and the American Farm Bureau Federation. Prerequisite: Agricultural Economics 1. Mr. Hibbard.

155. PRICES OF AGRICULTURAL PRODUCTS. II; 3 cr. An analysis and interpretation of the factors affecting the prices of agricultural products, together with a study of price movements—trends, cycles and minor fluctuations. The interrelationship of price, demand and supply of various types of agricultural products. Attention will be given to the interpretation of materials contained in public and private outlook reports. Prerequisite: Agricultural Economics 1. Mr. Mortenson.

180. TOPICAL WORK. Yr; *cr. Staff.

200. RESEARCH. Yr; *cr. Cooperation and marketing, Mr. Bakken and Mr. Schaars. Farm surveys and financial accounts in their relation to farm management, Mr. McNall. Cost accounting and its relation to farm management, Mr. McNall. History of agricultural production, Mr. Hibbard. Farmer movements, taxation and farm credit, Mr. Hibbard. Land economics and land problems, Mr. Wehrwein. Prices of agricultural products, Mr. Mortenson.

221. LAND INCOME. II; 2 cr. The economic characteristics of land; the economics of land ultilization with reference to costs and income; theories of rent; valuation and taxation of land. Prerequisite: Graduate standing. Mr. Wehrwein.

226. LAND PROBLEMS. Yr; 2 cr. The economic status of the agricultural classes with special reference to the relations of landlord and tenant. Prerequisite: Graduate standing. Mr. Hibbard and Mr. Wehrwein.

OUR TEAM TO JUDGE DAIRY CATTLE AT THE NATIONAL DAIRY SHOW AT ST. LOUIS

228. SEMINARY: HISTORY OF MARKETS AND MARKETING. II; 2 cr. A study of the historical development, including the economic principles involved, of markets from early continental fairs; inquiring into the practices and customs of auctions, clearing houses, exchanges and boards of trade; and giving attention to the emergence of modern sales agencies operating under cooperative, private and governmental initiative. Prerequisite: Graduate standing. Mr. Bakken and Mr. Schaars.

229. ADVANCED AGRICULTURAL ECONOMICS. Yr; 2 cr. The fundamentals of economics in their application to agricultural problems. Recent works in English, German and French will be used. Prerequisite: Graduate standing. Mr. Hibbard.

AGRICULTURAL EDUCATION

JOHN AMBROSE JAMES, B.S., *Professor of Agricultural Education, Chairman*
KIRK LESTER HATCH, B.S., *Professor of Agricultural Education*
THOMAS LYMAN BEWICK, M.S., *Professor of Agricultural Extension*
VINCENT EARL KIVLIN, M.S., *Assistant Professor of Agricultural Education*
IVAN GLEN FAY, B.S., *Assistant Professor of Agricultural Education*
WARREN WILLIAM CLARK, B.S., *Associate Professor of Agricultural Extension*

Students in the College of Agriculture who wish to prepare for the teaching of agriculture in secondary schools must complete a major and certain elective courses in animal husbandry, poultry, dairying, agronomy, horticulture, soils, agricultural engineering, agricultural economics, and agricultural journalism as a background of agriculture and also the fifteen credits in education required for the University Teachers' Certificate as outlined below. The major consists of a minimum of fifteen elective credits in any department in the College of Agriculture but preferably in Agricultural Education where twelve credits of the Teachers' certificate are a portion of the major and allow for greater choice of electives. For sample curriculum for teaching see page 11.

Students completing the requirements for graduation in Agriculture as suggested above and qualifying for a University Teachers' Certificate will receive the degree Bachelor of Science (Agriculture and Education) and a license to teach issued by the State Superintendent of Public Instruction. Such students must (a) register for the certificate in the School of Education at the beginning of the junior year, (b) receive the recommendation of the teacher training committee of the College of Agriculture, (c) complete the following courses:

	Credits
Educ. 31—Principles of secondary education	3
Educ. 75—Psychology and practice of teaching	5
Agr. Educ. 1—Rural education	2
Agr. Educ. 301—Program building in vocational agriculture	2
Agron. 302—Teaching of agriculture	3
	15

Students beginning work for a certificate may arrange their courses most satisfactorily by starting to meet the requirements during the second semester of the sophomore year or the first semester of the junior year. Education 31

and 75 should definitely be completed before the beginning of the senior year. During the senior year the three courses in agricultural education are prescribed. This provides the best sequence and one which interferes least with technical subjects. Students should secure a list of the desirable technical agricultural elective courses from the chairman of the Department of Agricultural Education, and discuss with him the requirements for the certificate.

Graduates of the professional courses of the state teachers' colleges who are majoring in agriculture and who wish to qualify for the University Teachers' Certificate, should elect 8 credits as follows:

	Credits
Education (advanced)	3-4
Agricultural Education (advanced; or 302)	3
Agricultural Education 301	2

Candidates may be excused from the departmental teachers' course with the approval of the Chairman of the Department of Agricultural Education.

MAJOR. Not more than 5 credits in education taken in Letters and Science may count on the major in agricultural education. These 5 credits shall in no way be counted as a portion of the 50 credits required in the strictly agricultural subjects.

A WISCONSIN "GRAD" TEACHING FARMERS OF THE FUTURE
Students in agricultural education do practice work with classes of high school age.

There is a demand for men trained as principals and superintendents for rural communities and small cities. Teachers' college graduates and others with teaching experience are urged to consider this opportunity. The opportunity for electives outside this college makes it possible to take many courses in the Department of Education and thus to prepare for this field.

1. RURAL EDUCATION. II; 2 cr. Origin and development of vocational education for rural communities. Problems, principles, and practices of rural education. For future leaders, farmers, and teachers. Open to sophomores. Mr. James.

5. JUNIOR EXTENSION. I; 2 cr. Place of boys' and girls' clubs in rural education. Educational values, methods of organization, leadership,

meetings, demonstrations, follow-up materials, exhibits and reports. For prospective extension workers and teachers. Lectures and demonstrations. Mr. Bewick.

25. RURAL LIFE (Ag. Econ. 25). I; 3 cr. Counts as part of education major. Mr. Kolb.

100. THESIS. Yr; 2 cr. Original work on problems of agricultural extension or teaching. Staff.

103. SEMINARY. I, II; *cr. Special problems in rural education and educational problems of county agent, demonstrator, extension workers, teachers, and rural leaders. Mr. James.

110. TRAINING COURSE FOR COUNTY AGENTS. II; 2 cr. Development and administration of the county agent system. The agent's responsibilities to the federal and state governments and the community. Projects, plans for work, and county organization; relation of college specialists and local organization. Open only to seniors and graduate students. Mr. Clark.

200. RESEARCH. Yr; *cr. Topical work relative to problems of elementary, vocational, or college agricultural education; extension, county agent, or demonstration work. Mr. James, Mr. Clark.

301. PROGRAM BUILDING IN VOCATIONAL AGRICULTURE. I, II; 2 cr. Factors determining the program of work, directed practice, part-time and evening schools, etc., adapted to teaching agriculture in secondary schools. Prerequisites: Agr. Educ. 1 and senior standing. Mr. Kivlin.

302. TEACHING OF AGRICULTURE. I, II; 3 cr. Directed teaching based upon participation in agricultural activities of the Wisconsin High School, problems of subject matter and methods of teaching. Open only to seniors registered for a teachers' certificate. Mr. Kivlin.

AGRICULTURAL ENGINEERING

EDWARD RICHARD JONES, M.S., *Professor of Agricultural Engineering, Chairman*
FLOYD WALDO DUFFEE, B.S., *Professor of Agricultural Engineering*
OTTO REINHART ZEASMAN, B.S., *Associate Professor of Soils and Agricultural Engineering*
FREDERICK B. TRENK, B.S.F., *Instructor in Forestry*
STANLEY ARTHUR WITZEL, C.E., *Instructor in Agricultural Engineering*

The undergraduate courses in this department are service courses for students majoring in other departments, as well as the basis for advanced work of majors in agricultural engineering, both the non-technical and the technical.

The laboratories are well-equipped with farm machinery, engines and tractors for the study of general mechanical principles. Some of the laboratory work is given in the fields of the University farms. The University Marsh of 100 acres of tile-drained land is an excellent drainage laboratory.

Students inclined toward engineering and desiring to return to their farms or to take positions as agricultural agents of farm managers or to enter

the farm equipment business, are advised to major in non-technical engineering, which has no special requirement in mathematics. They are advised to take, in addition to their major studies, liberal electives in soils, agronomy, agricultural economics, and business methods. A major in non-technical agricultural engineering may be combined with a University Teachers Certificate giving the legal qualifications to teach in the high schools.

Those desiring to enter the more technical fields of mechanical, electrical, civil, or structural engineering as applies to agriculture, are recognized as majors in technical agricultural engineering, and are requested to consult the department chairman before or during the first semester of the freshman year so that the proper sequence of studies in mathematics, drawing, and mechanics may be followed, substituting Mathematics 51 for Mathematics 71. In addition to the required courses in the College of Agriculture the student takes Mathematics 52, 54, and 55; Drawing 1, 2, and 3; Mechanics 1, 2, and 3; and Physics 51 and 52. Graduating from agriculture at the end of four years, it is possible for these men to finish the course in civil, mechanical, or electrical engineering with about three semesters of additional work. This gives them thorough training in pure engineering, which, in addition to an agricultural background, is so essential to professional agricultural engineers. These men are in keen demand by rural power, construction and reclamation companies and the manufacturers of farm machinery and equipment.

Throughout the year the majors in both technical and non-technical agricultural engineering function as a student branch of the American Society of Agricultural Engineers, and during the first semester of either the junior or senior years they take Agricultural Engineering 121.

GOING TO THE MARSH
Practical work in drainage is done by students in the course, Agricultural Engineering 1.

1. LAND DRAINAGE. I; 3 cr. Principles, practices and economics of land drainage. Design of drainage systems, computation of gradients, tile testing, and water measurement. Subdivision of land, levelling, chaining, plane table mapping, contours and profiles. Engineering students previously trained in topographic surveying substitute additional drainage work. Optional subject for all agricultural students. Lab. fee $2.25. Mr. Jones.

2. FARM STRUCTURES. I; 3 cr. Requirements of farm buildings and their economical design, including the house, animal and machinery shelter, feed and vegetable storage, and other farm structures. Wall insulation, heating, lighting and ventilation. Water supply, sewage disposal and concrete construction. Lab. fee $2.25. Mr. Jones.

3. GAS ENGINES. I; 3 cr. Construction and operation of gasoline engines; farm electric light plants and electric motors; power transmission. It is desirable to have this course preceded by Shop 2. Lab. fee $4.50. Mr. Duffee.

5. FARM FIELD MACHINERY. II; 3 cr. Lectures and laboratory studies on the construction and operation of tools and machinery for preparing the seed bed, sowing and planting, tilling and harvesting farm crops. Optional subjects for all agricultural students. Lab. fee $2.25. Mr. Duffee.

8. MECHANICAL PRACTICES. II; 2 cr. Laboratory practices in (1) gas engines (2) farm machinery (3) rope work, knot tying, belt lacing, harness repair and soldering (4) domestic engineering (5) land drainage or (6) tractors. Synoptic courses for vocational teachers electing any four of these six units. Lab. fee $4.50. Mr. Jones, Mr. Duffee.

100. THESIS. Yr; 2 cr. Lab. fee $2.25 per lab cr. Staff.

101. DRAINAGE DESIGN. II; 2 cr. (formerly numbered 102) Preliminary and final surveys and designs for farm and community drainage systems near Madison and other convenient places. Optional work is provided for those specializing in irrigation. Field work and conferences by appointment. Prerequisite: Agr. Engr. 1 or Top. Engr. 1 and 2. Mr. Jones.

PLANNING THE FARMSTEAD

Students are taught the planning of houses, barns and the making of blue prints, plans and specifications.

103. FARM TRACTORS. II; 3 cr. (formerly numbered 101) Laboratory tests of gas engines and field practice with farm tractors. Prerequisite: Agr. Engr. 3. Lab. fee $4.50. Mr. Duffee.

105. BELT AND TRACTOR MACHINERY. II; 2 cr. Threshers, silo fillers, and other belt-driven farm machines, large and small; tractor plow; machinery calibration tests. Lectures, laboratory studies, and field demonstrations. Prerequisites: Agr. Engr. 5 and 101 or concurrent registration. Offered 1929-30 and in alternate years. Lab. fee $2.25. Mr. Duffee.

120. SPECIAL PROBLEMS. I and II; *cr. Open to technical majors who have had prerequisite training for advanced work in farm machinery, farm power, farm structures, land clearing, drainage or forestry. Lab. fee $2.25 per lab. cr. Mr. Jones, Mr. Duffee, Mr. Witzel, Mr. Trenk, Mr. Zeasman.

121. SEMINARY. I; 1 cr. Review of current literature and studies of agricultural engineering problems. For juniors, seniors and graduate students. Mr. Jones and staff.

200. RESEARCH. Yr; *cr. Agricultural Engineering problems for students qualifying for advanced degrees. Lab. fee $2.25 per lab. cr. Mr. Jones, Mr. Duffee, Mr. Witzel.

ELECTIVES IN THE COLLEGE OF ENGINEERING

SHOP 2. BENCH WORK, FORGE, AND WELDING. I, II; 1 cr. Forge and bench work in iron and steel. The processes involved in forging, welding, and brazing of iron and steel. The use of the chisel, file, and drill in finishing and fitting. Lab. fee $3.00. Mr. Hollander.

SHOP 15. GENERAL FARM CARPENTRY. I, II; 1 or 2 cr. The use and care of tools and principles involved in the construction of such structures as concrete forms and farm buildings; framing of doors and windows, and interior finishing. Lab. fee $3.00. Mr. Cluley.

HONORING THE AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS

ELECTIVES GIVEN BY FOREST PRODUCTS STAFF

1. FORESTRY AND UTILIZATION OF WOOD. I; 2 cr. General introductory course. Includes identification of native trees, forest conditions and forest policy in the United States and utilization of wood. Mr. Tiemann.

102. WOOD TECHNOLOGY. II; 2 cr. Includes a study of the formation, structure, and properties of wood, laboratory identification of United States species of wood. Forms a logical sequence to Course 1 but can be taken independently. Especially suited for students who expect to go into some wood-using business, or for students intending to specialize in forestry elsewhere. Mr. Tiemann.

AGRICULTURAL JOURNALISM

ANDREW WINKLE HOPKINS, B.L., *Professor of Agricultural Journalism, Chairman*
WILLIAM ALLISON SUMNER, B.S., *Associate Professor of Agricultural Journalism*
GRACE LANGDON, M.A., *Instructor in Agricultural Journalism*
RUPERT HENRY RASMUSSEN, M.S., *Instructor in Agricultural Journalism*

The ability to write simple, understandable English is invaluable to the teacher, extension worker, county and home demonstration worker, and farmer. To render the greatest service the technically trained worker must use the printed page. Selling and advertising are important in the neglected half of farming—the business side. More and more farmers are coming to appreciate the need of salesmanship, sales letter writing, effective classified and display advertisement, and systematic sales campaigns.

For students returning to the farm, Agricultural Journalism 1 and 3 are suggested. For prospective teachers and extension workers, courses 1, 3 and 103 are recommended. For research workers and future college staff workers Agricultural Journalism 1, 103 and 105 are advised.

Majors in the department will be expected to take Agricultural Journalism 1, 2, 3, 100, 103, 111, 150, and 200. Courses in the Department of Journalism in the College of Letters and Science may be taken and not to exceed 5

EVERY AG NEEDS THE "MAG"

The editors of the Country Magazine learn the business of writing articles by actual experience

credits from the following courses may count on the major: Journalism 2, Newspaper reporting and correspondence; Journalism 3, Copy reading; Journalism 7, Community newspaper; Journalism 104, Editoral writing.

1. WRITING FARM NEWS. I; 3 cr. An elementary course to help students who expect to write news articles about farming for publication in the weekly or daily papers or the various agricultural journals. Mr. Sumner.

2. PRACTICE IN EDITING. I, II; 1 cr. The editorial, business, and circulation problems of the Wisconsin Country Magazine are analyzed and actual practice given on the magazine. Mr. Sumner.

3. AGRICULTURAL ADVERTISING. II; 3 cr. How to write "want ads", advertisements to sell livestock, dairy products, fruit, berries, truck, food products; how to write the business letters of the farmer; the preparation of booklets, posters, sales bills, and other mediums. Lectures and assignments for practice. Mr. Sumner.

8. WRITING HOME ECONOMICS NEWS. I; 3 cr. A course in the fundamentals of writing home economics material. Designed to aid teachers and extension workers in publicity and to give training to students who plan to make a profession of journalism. Mr. Sumner.

100. THESIS. Yr; 2 cr. Original studies of a journalistic or advertising nature. Practical problems are investigated. Mr. Hopkins, Mr. Sumner.

103. AGRICULTURAL PUBLICITY METHODS. II; 2 cr. Outlining and finding effective methods of publicity. This course takes up the publicity campaign, the different mediums as to their advantage and uses, publicity copy, exhibits, and charts. Prerequisite: Agr. Journ. 1 or 8. Mr. Hopkins.

104. THE HISTORY OF FARM PAPERS. II; 2 cr. (Not given 1931-32) A survey of the farm paper field, past and present. Mr. Sumner.

105. WRITING AND EDITING FARM BULLETINS. I; 2 cr. A course for those who have to use or write station or extension bulletins and circulars Mr. Sumner.

106. ADVERTISING SURVEY FOR HOME ECONOMICS. II; 2 cr. A general course to present to the home economics student who expects to enter the business world, a background of sales and advertising methods and practices. Mr. Sumner.

111. WRITING FARM AND HOME FEATURES. II; 2 cr. A course to follow the elementary courses in writing farm and home stories. The technique of writing the longer feature stories for the farm papers and women's magazines is given primary consideration. Prerequisite: Agr. Journ. 1 or 8. Mr. Sumner.

150. SEMINARY. I, II; 2 cr. Mr. Hopkins, Mr. Sumner.

200. RESEARCH. I, II; *cr. A practice problem such as confronts the county agent, scientist, publicity man, extension worker, or editor is analyzed and an effort made for a constructive solution. Advertising problems and policies such as confront the breeder or pure-bred seed grower may be studied. Prerequisite: Agr. Journ. 1, 3, or 8. Mr. Hopkins, Mr. Sumner.

AGRONOMY

RANSOM ASA MOORE, *Professor of Agronomy, Chairman*
EDMOND JOSEPH DELWICHE, M.S., *Professor of Agronomy*
LAURENCE FREDERICK GRABER, Ph.D., *Professor of Agronomy*
GEORGE BYRON MORTIMER, B.S., *Professor of Agronomy*
BENJAMIN DONALD LEITH, B.S., *Professor of Agronomy*
GEORGE MCSPADDEN BRIGGS, B.S., *Associate Professor of Agronomy*
ANDREW HAMILTON WRIGHT, M.S., *Associate Professor of Agronomy*
ALDEN LESCOMBE STONE, *Assistant Professor of Agronomy*
EUGENE DAVENPORT HOLDEN, M.S., *Assistant Professor of Agronomy*
RUEBUSH GEORGE SHANDS, Ph.D., *Assistant Professor of Agronomy*

PRACTICAL MAJOR. Students majoring in agronomy and wishing to prepare for farming, farm managers, county agricultural agents, crop reporting positions, commercial positions in seed trade, or teachers of secondary school agriculture, should elect 10 credits from the following: Physics 61, 5 cr.; Zoology 3, 3 cr.; Geology 1, 5 cr.; Geography 106, 3 cr.; Botany 2, 5 cr.; Chemistry 11, 3 cr.; Mathematics 2, 4 cr.; Mathematics 3, 3 cr.

It is suggested that the courses selected in agronomy be taken in the following order. For the sophomore year, 120, 3 cr.; 102, 2 cr.; for the junior year, 106, 3 cr.; for the senior year, 107, 2 cr.; 121, 3 cr.; 130, 3 cr.; 131, 2 cr.

Practical majors desiring to teach secondary school agriculture should note the regular teacher training requirements given under Agricultural Education.

SCIENTIFIC MAJOR. Students desiring to prepare as professional argonomists such as plant breeders, either institutional or commercial research and extension specialists, teachers, or seed analysts should take a more specialized major emphasizing scientific subjects. In the sophomore year Chemistry 11, 3 cr., and Zoology 3, 3 cr., should be taken together with an additional 4 cr. in either science or mathematics. Soils 1, 5 cr. and Agricultural Chemistry 1 and 2, 5 cr., are suggested. In the junior or senior year, Chemistry 20, and 21, 4 cr., Genetics 101, 3 cr., Botany 117, 3 cr., Soils 127, 2 cr. and Plant Pathology 101, 3 cr.

Departmental requirement should be followed as suggested under the practical major with the addition of Agronomy 205, 2 cr., in the senior year. If graduate work is intended a foreign language should be added beginning with the junior year. Not to exceed five credits from the following courses may be counted as a portion of the major requirement in Agronomy: Soils 120, Soil management; Soils 127, Soil science and plant nutrition; Plant Pathology 101, Diseases of plants; Plant Pathology 116, Diseases of field crops; Botany 117, Structure of economic plants; and Botany 129, Classification of cultivated plants.

1. GENERAL FARM CROPS. I, II; 3 cr. Includes a study of varieties and types, botanical relations, adaptations, cultural practices, judging, and studies of individual crops. Required of all agricultural students. Lab. fee $4.50. Mr. Mortimer.

100. THESIS. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Staff.

101. SPECIAL CROP PROBLEMS. Yr; *cr. Offered at Madison and the branch experiment stations. Lab. fee $2.25 per lab. cr. Staff.

102. PASTURES AND PASTURE PROBLEMS. I; 2 cr. Pasture studies based on kinds; best methods of establishing, maintaining and improving them; and the crops best suited to this use. Prerequisite: Agronomy 1. Mr. Mortimer.

106. FORAGE CROPS. II; 3 cr. Growing and handling forage crops, with emphasis on recent developments in relation to livestock farming. Prerequisite: Agronomy 1. Mr. Moore, Mr. Graber.

107. FORAGE PROBLEMS. II; 2 cr. Physiological, anatomical, and morphological aspects of forage plants in relation to field practices, with emphasis on food reserves, winter injury, and other agronomic problems. For seniors and graduate students. Lab. fee $4.50. Mr. Graber.

FARM MANAGEMENT AND CROP ROTATION
A class in agronomy considering the problems of crop rotation and their relation to the management of the farm.

120. SEED AND WEED CONTROL. I; 3 cr. A study of the economic relations of farm seeds and weeds to profitable agriculture. Prerequisite: Agronomy 1. Lab. fee $4.50. Mr. Stone.

121. GRAIN PRODUCTION AND CROP JUDGING. I; 3 cr. Varieties, uses, distribution, and approved practices in growing, together with judging competitive farm crop displays. Prerequisite: Agronomy 1. Lab. fee $4.50. Mr. Mortimer.

130. PLANT BREEDING. II; 3 cr. Methods and principles involved in the improvement of crops. Prerequisites: Agronomy 1 and Botany 1. Mr. Leith.

131. SEMINARY. Yr; 1 cr. A review of current literature and studies of agronomic problems. For seniors and graduate students. Prerequisites: Agronomy 1 and Botany 1. Staff.

200. RESEARCH. Yr; *cr. Agronomic problems for students qualifying for advanced degrees. Given in connection with thesis or graduate study. Lab. fee $2.25 per lab. cr. Staff.

205. CROP ENVIRONMENT. II; 2 cr. Reports and discussions on the findings in fields related to crop plants, and their interrelations. Offered 1930-31 and in alternate years. Mr. Wright.

ANIMAL HUSBANDRY

WILLIAM ARNON HENRY, Sc.D., D.Agr., *Professor of Agriculture, Emeritus*
GEORGE COLVIN HUMPHREY, B.S., *Professor of Animal Husbandry, Chairman*
GUSTAV BOHSTEDT, Ph.D., *Professor of Animal Husbandry*
JAMES GARFIELD FULLER, M.S., *Professor of Animal Husbandry*
ARLIE MAX MUCKS, B.S., *Associate Professor of Animal Husbandry*
JOHN MERRILL FARGO, M.S., *Assistant Professor of Animal Husbandry*
ISAAC WALKER RUPEL, M.S., *Assistant Professor of Animal Husbandry*
ARTHUR OWEN COLLENTINE, *Instructor in Animal Husbandry*
ALBERT JULIUS CRAMER, B.S., *Instructor in Animal Husbandry*
ROY THEODORE HARRIS, *Instructor in Animal Husbandry*
JAMES JEROME LACEY, *Instructor in Animal Husbandry*
BENJAMIN HAMILTON ROCHE, M.S., *Instructor in Animal Husbandry*

Two majors are offered students in animal husbandry. The practical major is intended primarily for students who intend to return to the farm as farm managers or herdsmen, or who intend to qualify as vocational agricultural teachers or county agricultural agents. Students taking this major should elect Agricultural Chemistry 1 and 2 and Physiology 3, Animal physiology, in their sophomore year. In the junior and senior years they should elect animal husbandry courses in feeding, judging, breeding and production. Students who wish to qualify for a teacher's certificate should elect teachers' courses not later than the beginning of the junior year. Agricultural Journalism 3, Advertising; Agricultural Economics 10, Farm Organization and Management; Dairy Husbandry 5, City milk supply; and Agricultural Bacteriology 121, Dairy bacteriology; and practical courses in other departments are suggested.

The scientific major is planned for men desiring to go into college or experiment station work and is suggested for those intending to do extension work. For training in this field students should elect Veterinary Science 1

STUDENT JUDGES AT THE INTERNATIONAL
Each year a group of our students take part in the collegiate judging contest at Chicago.

and Dairy Husbandry 1 in the sophomore year. Organic chemistry should be taken in the junior year in addition to courses suggested in the practical major. In the senior year desirable electives, in addition to some production

courses, are Agricultural Chemistry 121, Dairy chemistry; Agricultural Chemistry 122, Animal chemistry; and Genetics 101 and 102. Not to exceed five credits from the following courses may be counted as a portion of the major requirements in animal husbandry: Agricultural Chemistry 121 and 122, Genetics 101 and 102, Veterinary Science 2 and 3.

1. LIVESTOCK PRODUCTION. I, II; 3 cr. Livestock survey, breed history, judging, market classification; practical problems, lectures, and laboratory exercises. Required of all agricultural students. Lab. fee $4.50. Mr. Fuller.

5. LIVESTOCK JUDGING AND SHOWING. I; 2 cr. This course is devoted to the judging and showing of horses, beef cattle, sheep and swine. Members of the live stock judging team will be selected from the class taking this course. Prerequisite: An. Husb. 1. Lab. fee ..... Mr. Fargo.

6. DAIRY CATTLE JUDGING, FITTING AND SHOWING. II; 2 cr. A course for training in dairy cattle judging and showmanship. Prerequisite: An. Husb. 1. Lab. fee ..... Mr. Rupel.

100. THESIS. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Mr. Humphrey and staff.

124. ANIMAL BREEDING. II; 2 cr. The principles and approved methods relating to the breeding of livestock. Prerequisite: An. Husb. 1. Mr. Fargo.

126. LIVESTOCK FEEDING. I; 4 cr. A study of the principles of feeding and the composition of feeds; practice in formulating rations for the various classes of livestock; evaluation of feeds and feeding practices from a study of experiments and customs. Prerequisite: An. Husb. 1. Mr. Bohstedt, Mr. Rupel.

129. SHEEP PRODUCTION. II; 2 cr. A study of breed history and judging; farm flock management for production of market and pure-bred sheep, including wool-grading and judging; fattening western lambs for market. Prerequisite: An. Husb. 1. Lab. fee $2.25. Not offered 1930-31.

130. SWINE PRODUCTION. I; 3 cr. Judging of breeding and market hogs; history of the hog industry in America; systems and costs of production and marketing; the hog carcass and consumption of pork products; and the breeding, feeding, and management of breeding and market hogs. Prerequisites: An. Husb. 1 and 126. Lab. fee $4.50. Mr. Fargo.

131. HORSE PRODUCTION. I; 2 or 3 cr. Pedigree work, conformation study, judging, production problems, and fundamentals in breaking and hitching. Prerequisite: An. Husb. 1. Lab. fee $2.25. Mr. Fuller.

132. BEEF CATTLE PRODUCTION. II; 2 cr. Pedigree work, judging, feeding, and marketing beef cattle; production problems. Prerequisite: An. Husb. 1. Lab. fee $2.25. Mr. Fuller.

133. DAIRY CATTLE AND MILK PRODUCTION. II; 3 cr. Selection of animals for milk production and for breeding purposes. Present day types and breed characteristics. Herd management, advanced registry testing, calf raising, selling of surplus breeding stock. Control measures relating to quality in commercial and special grades of milk. A two-day tour to visit leading pure-bred herds, dairy equipment plants, and farms

producing certified milk is required; the cost is from $10.00 to $15.00. Prerequisite: An. Husb. 1. Lab. fee $4.50. Mr. Rupel.

134. SPECIAL PROBLEMS. Yr; *cr. Special problems on feeding, management, breeding, or judging of livestock, including laboratory, library, or field work with conferences and reports. These problems will be assigned by respective members of the staff. Consent of instructor required. Lab. fee $2.25 per lab. cr. Mr. Fuller and staff.

135. ANIMAL HUSBANDRY SEMINARY. Yr; 1 cr. Studies and discussions of research work in animal husbandry and related fields; reports on articles of interest. For advanced and graduate students. Mr. Bohstedt.

200. RESEARCH. Yr; *cr. A detailed study of a definite research problem in animal husbandry. Conference on experimental methods. Lab. fee $2.25 per lab. cr. Mr. Bohstedt and staff.

DAIRY HUSBANDRY

EDWARD HOLYOKE FARRINGTON, M.S., *Professor of Dairy Husbandry, Emeritus*
HOWARD CAMPBELL JACKSON, Ph.D., *Professor of Dairy Husbandry, Chairman*
WALTER VAN PRICE, Ph.D., *Professor of Dairy Husbandry*
HUGO HENRY SOMMER, Ph.D., *Professor of Dairy Husbandry*
JOHN LANGLEY SAMMIS, Ph.D., *Associate Professor of Dairy Husbandry*
LOUIS CHARLES THOMSEN, B.S., *Assistant Professor of Dairy Husbandry*
HANS TJELLESEN SONDERGAARD, *Instructor in Dairy Husbandry*

The department offers instruction in the science and art of manufacturing dairy products, suited to the needs of (a) farm dairymen, (b) investigators or teachers, (c) managers, operators, or inspectors of creameries, cheese factories, city milk, ice cream plants, and condenseries.

Students majoring in dairy manufacturing should elect Physics 61, 5 cr., Chemistry 20 or 120, 5 cr., Agricultural Chemistry 1 and 2, 5 cr., and Dairy Husbandry 1, 3 cr., in the sophomore year. Agr. Chem. 121, Dairy chemistry, 5 cr., and Agr. Bact. 121. Dairy bacteriology, 3 cr., should be taken in the junior year; and Dairy Husbandry 3, 5, and 8, 3 cr. each, Dairy Husbandry 4, 4 cr. and Dairy Husbandry 123, 2 cr. should be taken in the senior year as a minimum. See curriculum on page 12.

Dairy Husbandry is intimately connected with the Departments of Animal Husbandry, Agricultural Bacteriology, and Agricultural Chemistry, and with marketing given in the Department of Agricultural Economics. Students preparing for dairy manufacturing should consider courses in these departments when selecting electives related to the major.

1. INTRODUCTION TO DAIRYING. II; 3 cr. A general survey course designed to give the student an understanding of the relationship of dairy manufacturing to general farm problems. Emphasis is given to methods of quality control, judging, and elementary analysis of dairy products. Lab. fee $4.50. Mr. Jackson, Mr. Thomsen.

3. CREAMERY OPERATION AND MANAGEMENT. I; 1-3 cr. The theory and practice of cream separation, the pasteurization and handling of dairy products under commercial conditions, composition and flavor control of butter, and the management and operation of creameries. Lab. fee $2.25 per lab. cr. Mr. Jackson, Mr. Thomsen.

4. CHEESE-MAKING. I; 4 cr. A combined lecture and laboratory course

DAIRY MANUFACTURING AT WISCONSIN

The dairy department of Wisconsin is one of the most important as Wisconsin leads in dairying.

to study the manufacture of cheese. Several types of cheese will be made by the students in the laboratory to acquaint them with commercial practices and to illustrate the importance of certain physical, chemical, and biological factors which influence curd-making and cheese-ripening. Lab. fee $4.50. Mr. Price.

5. CITY MILK SUPPLY AND ICE CREAM MAKING. I; 3 cr. The commercial handling of market milk and preparations. Milk ordinances and board of health regulation of milk supplies. Theory and practice of ice cream making. Lab. fee $4.50. Mr. Sommer.

8. DAIRY MECHANICS. II; 3 cr. Dairy plant construction, heating, ventilation, sewage disposal, refrigeration, installation and operation of dairy machinery. Lab. fee $2.25. Mr. Thomsen.

100. THESIS. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Staff.

102. DAIRY PRACTICE. Yr; 1-4 cr. One credit for each 48 hours of work. Lab. fee $2.25 per lab. cr. Mr. Jackson.

121. ADVANCED DAIRY MANFACTURING PROBLEMS. Yr; 1-3 cr. Problems relating to dairy manufacturing. Lab. fee $2.25 per lab. cr. Staff.

123. SEMINARY. Yr; 1 cr. For advanced and graduate students. Mr. Sommer and staff.

124. PHYSICAL CHEMISTRY OF DAIRY PRODUCTS. II; 3 cr. Physical chemistry of dairy products, laboratory exercises on hydrogen ion concentration, oxidation-reduction potentials, surface tension, absorption, vis-

cosity and plasticity, isoelectric point of proteins, colloidal properties of milk constituents. Offered (1931-32) and in alternate years, Lab. fee $4.50. Mr. Sommer.

200. RESEARCH. Yr; *cr. Experimental study of problems in dairy manufacturing. Lab. fee $2.25 per lab. cr. Staff.

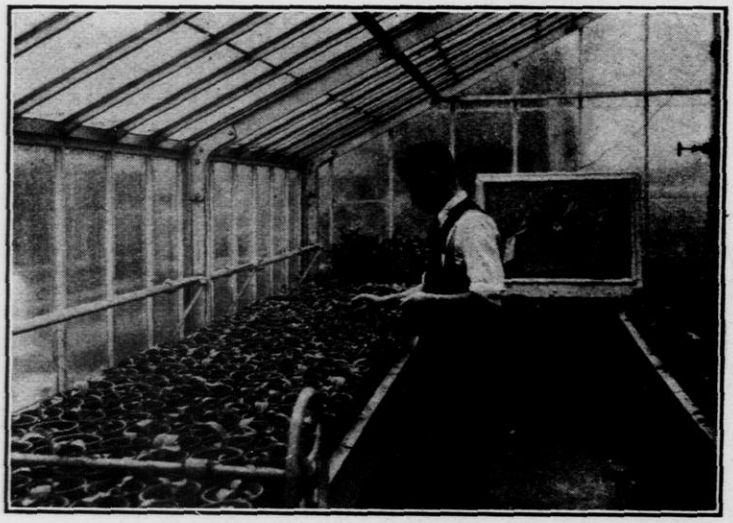
ECONOMIC ENTOMOLOGY

HARLEY FROST WILSON, M.S., *Professor of Economic Entomology, Chairman*
CHARLES LEWIS FLUKE, JR., Ph.D., *Associate Professor of Economic Entomology*
EDWARD M. SEARLS, M.S., *Assistant Professor of Economic Entomology*
GEORGE EUGENE MARVIN, M.S., *Instructor in Economic Entomology*

Students majoring in economic entomology and desiring to be trained in entomological or beekeeping research for the positions offered by the state agricultural experiment stations and the government service, should follow Curriculum B. Those preparing for entomological chemical work, especially with insecticides, should elect more work in chemistry and physics. Students pursuing specialized lines, such as biological control of insects, insect physiology, and insects in relation to plant diseases, should elect more work in plant pathology, botany, and physiology.

Those interested in the opportunities in the field of entomology and beekeeping should write to the Department of Economic Entomology for a special circular of information.

1. FARM INSECTS. II; 3 cr. A study of the insect groups, especially those in relation to the farm and home. Each student makes a collection of at least one hundred specimens, which he classifies. Optional subject for all agricultural students. Lab. fee $4.50. Mr. Fluke.



STUDYING INSECTS IN THE GREENHOUSE

With greenhouse facilities the student rears insects during the winter and makes his observations though there may be a blizzard outside.

2. ELEMENTARY ECONOMIC ENTOMOLOGY. I; 3 cr. The fundamental principles of entomology are stressed, giving the student a foundation in the subject which prepares him for advanced studies of insects. Lab. fee $4.50. Mr. Fluke.

10. ELEMENTARY BEEKEEPING. I; 2 cr. Elementary principles of beekeeping with lectures and practical laboratory work. A general survey of the subject is taken up, with the fall and winter care in the apiary being stressed. Lab. fee $2.25. Mr. Marvin.

100. THESIS. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Mr. Wilson and Staff.

103. ORCHARD INSECTS. II; 2 cr. A laboratory study of the life histories and controls of the principal insect pests of the orchard and bush fruits. Prerequisite: Economic Entomology 1 or 2, or Zoology 3. Offered 1930-31 and in alternate years. Lab. fee $2.25. Mr. Fluke.

105. FIELD CROP AND GARDEN INSECTS. II; 2 cr. A laboratory study of the principal insect pests of field, garden, and truck crops; their life histories and controls. Prerequisite: Economic Entomology 1 or 2, Zoology 3. Offered 1931-32 and in alternate years. Lab. fee $2.25. Mr. Searls.

110. COMMERCIAL HONEY PRODUCTION. II; 2 cr. Lectures and laboratory periods dealing with the yearly management of the apiary for intensified honey production, building up in the spring, swarm control, supering for the honey flow, and care of bees in the fall and winter. Prerequisite: Econ. Ento. 10, Lab. fee $4.50. Mr. Marvin.

120. TAXONOMY AND TOPICAL WORK. I, II; *cr. a. Biological relations of insects; physiology of insects. b. Methods in entomology and insect photography. c. Taxonomy of adult insects. Prerequisite: Economic Entomology 1 or 2. Lab. fee $2.25 per lab. cr. Mr. Wilson, Mr. Fluke, Mr. Searls.

123. TAXONOMY OF INSECT LARVAE. I; 3 cr. A study in the identification and morphology of immature insects. Lecture and laboratory. Prerequisites: Economic Entomology 2 and 120c or consent of instructor. Lab. fee $4.50. Mr. Searls.

125. INSECTS IN RELATION TO PLANT DISEASES. I; 2 cr. A study of the principal insect carriers and their habits; types of insect injuries affecting health of plants; modes of insect transmission and dissemination of plant diseases; and the methods of rearing and handling the carriers. Arranged to meet the needs of students in entomology, plant pathology, horticulture, and agronomy. Prerequisite: A course in entomology and plant pathology or consent of instructor. Lab. fee $2.25. Mr. Searls.

130. SEMINARY. I, II; 1 cr. For advanced and graduate students. Mr. Wilson.

200. RESEARCH. Yr; *cr. Lab. fee $2.25 per lab. cr. Mr. Wilson and staff.

GENETICS

LEON JACOB COLE, Ph.D., *Professor of Genetics, Chairman*
ROYAL ALEXANDER BRINK, D.Sc., *Associate Professor of Genetics*
MALCOLM ROBERT IRWIN, Ph.D., *Assistant Professor of Agricultural Bacteriology and Genetics*
AGNES ZEIMET, M.A., *Instructor in Genetics*

The following courses are designed for those who desire a general knowledge of the subjects of heredity and breeding, or who contemplate following these lines, either from the theoretical or practical point of view. Special opportunity is offered those doing advanced work to get practical experience in the methods of experimental breeding.

100. THESIS. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Mr. Cole, Mr. Brink.

101. PRINCIPLES OF BREEDING. I; 3 cr. Elementary principles of heredity in their application to plant and animal breeding. Additional prescribed reading and written reports for graduate credit. Prerequisite: A course in biology. Mr. Cole.

102. ELEMENTARY LABORATORY. I; 1-2 cr. Breeding experiments illustrating the principles of heredity. Prerequisite: Genetics 101 or concurrent registration. Lab. fee $2.25 per lab. cr. Mr. Brink and staff.

104. PLANT GENETICS. I; 3 cr. Variation and inheritance in plants, including genetics of sterility and disease resistance, and principles of plant improvement. Prerequisite: Genetics 101 or equivalent in zoology or botany. Mr. Brink.

105. ANIMAL GENETICS. II; 2 cr. Inheritance of economic characters in domesticated animals; study of animal breeding methods; evaluation and analysis of pedigrees; application of genetics to the problems of livestock production. Prerequisite: Same as for Genetics 104. Mr. Cole.

106. BIOMETRIC METHODS. II; 2 cr. Lectures and laboratory work in calculation of statistical measures of variability and correlation and their practical application. Determination and usage of probable errors of such measures and for Mendelian data. Prerequisite: Same as for Genetics 104. Lab. fee $2.25. Mr. Brink.

120. SEMINARY. Yr; 1 cr. Consent of instructor required before election. Mr. Cole.

121. TOPICAL WORK. Yr; *cr. Either (a) assigned topics in laboratory or field work with reading, conference, and report, or (b) practice work, including practical experience in the various lines of research carried on in the department; problems, technique, and methods of record keeping. For those not prepared to elect Course 200. May be taken in connection with, or subsequent to, Genetics 101; consent of instructor required. Lab. fee $2.25 per lab. cr. Mr. Cole, Mr. Brink.

200. RESEARCH. Yr; *cr. For students qualified by preliminary training. Work may be based on the analysis of available data, or upon new data acquired by experiment. The summer season offers exceptional opportunity for breeding work with both animals and plants. Opportunity is offered to a limited number of properly qualified students for research under direction during the summer. Such work may extend through the whole season and is applicable toward advanced degrees. Lab. fee $2.25 per lab. cr. Mr. Cole, Mr. Brink.

HORTICULTURE

JAMES GARFIELD MOORE, M.S., *Professor of Horticulture, Chairman*
JAMES JOHNSON, Ph.D., *Professor of Horticulture*
JAMES GARFIELD MILWARD, M.S., *Professor of Horticulture*
RAY HARLAND ROBERTS, Ph.D., *Professor of Horticulture*
FRANZ AUGUST AUST, M.S., M.L.D., *Associate Professor of Horticulture*
JOHN WILLIAM BRANN, M.S., *Assistant Professor of Horticulture and Plant Pathology*
CONRAD LOUIS KUEHNER, B.S., *Assistant Professor of Horticulture*
NORMAN K. MORRIS, B.S., *Instructor in Horticulture*
GEORGE WILLIAM LONGENECKER, B.S., *Instructor in Horticulture*
WILLIAM BUTLER OGDEN, B.S., *Instructor in Horticulture*

The courses offered in horticulture permit the student to specialize in fruit growing, landscape design, or vegetable production. The choice of electives taken in other departments to supplement horticultural courses will be determined by the specialization and the particular phase of the work the student expects to enter. Courses 1, 2, 5, 6, and 7 should be of particular interest to students specializing in other departments who are fitting themselves to be county agents, teachers in vocational or high schools, or farm managers or operators.

Majors in general horticulture may count a maximum of five credits towards the major requirement by electing Economic Entomology 1 and Plant Pathology 5. Students specializing in landscape gardening may count toward the major five credits in the above mentioned courses or in the following: Agricultural Economics 25, Applied Arts 52, 62, and Topographic Engineering 108. Such students are also referred to courses in city planning, offered by the College of Engineering.

1. PRINCIPLES OF FRUIT GROWING. I; 3 cr. The principles of fruit growing and their application to our common tree fruits. Optional subject for all agricultural students. Lab. fee $2.25. Mr. Moore.

2. ADVANCED FRUIT GROWING. Yr; 2 cr. Lecture and laboratory work dealing with orchard practice, pruning, spraying, cultivation, harvesting, storing, and marketing fruits. Prerequiste: Hort. 1 or consent of instructor. Lab. fee $2.25. Mr. Roberts.

3. VEGETABLE GARDENING. II; 3 cr. Principles and practices involved in the growing of vegetables. Practical work in the gardens. Lectures and laboratory. Optional subject for all agricultural students. Lab. fee $4.50. Mr. Moore.

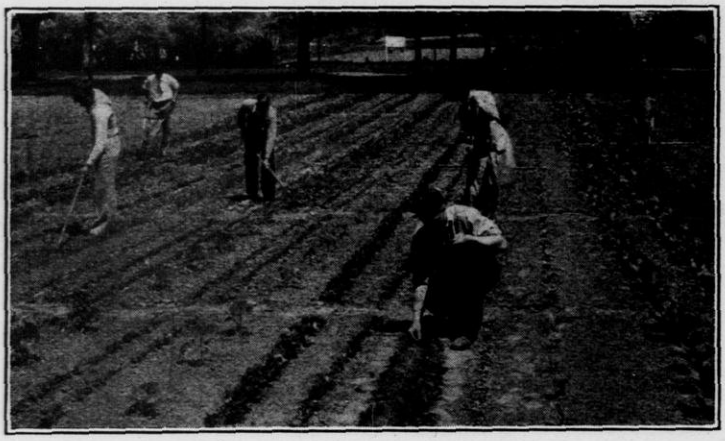
4. VEGETABLE FORCING. I; 3 cr. Principles involved in growing vegetables under glass with practical work in the forcing house. Forcing house constructon and heating. Offered 1930-31 and in alternate years. Lab. fee $4.50. Mr. Moore.

5. SMALL FRUIT CULTURE. I; 2 cr. Principles and practices of the successful culture of cane, bush, and other small fruits. Mr. Moore.

6. LANDSCAPE GARDENING. I; 3 cr. Discussion of the principles of landscape art. Field and laboratory work in the study of decorative plants and making of planting plans. A trip to some nursery will be taken

for the purpose of studying plant materials and nursery practice. Lab. fee $4.50. Mr. Aust, Mr. Longenecker.

7. PLANT PROPAGATION. II; 2 cr. Principles and practices involved in propagating horticultural plants. Lectures and laboratory. Lab. fee $2.25. Mr. Moore.



A CLASS IN VEGETABLE GARDENING

Each student propagates plants for his garden and actual practice is given in gardening.

8. FLORICULTURE. II; 3 cr. Propagation and care of house, garden, and lawn plants with reference to home floriculture. Designed for women. Lab. fee $2.25. Mr. Moore.

11. POTATOES AND TRUCK CROPS. I; 2 cr. Lectures and laboratory work on the methods of growing and improving potatoes, including variety, identification, and disease control. Also a general consideration of the more important truck crops, as cabbage, onions, celery. Lab. fee $2.25. Mr. Milward, Mr. Brann, Mr. Combs.

100. THESIS. Yr; 2 or more cr. Research work on horticultural subjects. Fees depend upon character of thesis work. Lab. fee $2.25 per lab. cr. Mr. Aust, Mr. Johnson, Mr. Moore, Mr. Roberts.

110. SEMINARY. Yr; 1 cr. For advanced and graduate students. Mr. Roberts, Mr. Aust.

121. HORTICULTURAL PROBLEMS. Yr; 1-5 cr. The student is assigned a special problem in the phase of horticulture in which he is particularly interested: (a) fruit-growing, Mr. Roberts, Mr. Moore; (b) gardening and floriculture, Mr. Moore; (c) landscape design, Mr. Aust; (d) plant materials, Mr. Aust; (e) landscape construction, Mr. Aust. Prerequisite: Consent of the instructor. Lab. fee $2.25 per lab. cr.

122. SYSTEMATIC POMOLOGY. I; 3 cr. Classification, identification, judging and distribution of our common fruits. Prerequisite: Consent of instructor. Offered 1931-32 and in alternate years. Lab. fee $4.50. Mr. Moore.

LANDSCAPE ART

An interesting field of work is found in landscape gardening.

125. ADVANCED LANDSCAPE GARDENING. II; 3 cr. Continuation of Horticulture 6. Advanced work in landscape design and drafting. A trip is taken to Lake Geneva for the purpose of studying different landscape treatments. Prerequisite: Hort. 6. Lab. fee $4.50. Mr. Aust, Mr. Longenecker.

126. RURAL IMPROVEMENT. II; 3 cr. A discussion of farmstead, community center, and regional planning and their relation to rural conditions. Lectures, assigned readings, reports. Prerequisite: Economics 1a. Mr. Aust.

LIBRARY

CLARENCE SCOTT HEAN, B.A., *Librarian*

1. LIBRARY PRACTICE. I; 1 cr. The classification and arrangement of books, filing of bulletins, use of card catalogs, periodical indexes, abstract journals, public documents, standard reference works, including handbooks in the various fields of knowledge, and the compiling of bibliographies. Mr. Hean.

PLANT PATHOLOGY

GEORGE WANNAMAKER KEITT, Ph.D., *Professor of Plant Pathology, Chairman*
JAMES GEERE DICKSON, Ph.D., *Professor of Plant Pathology*
BENJAMIN MINGE DUGGAR, Ph.D., *Professor of Botany and Plant Pathology*
EDWARD MARTINIUS GILBERT, Ph.D., *Professor of Botany and Plant Pathology*
LEWIS RALPH JONES, Ph.D., Sc.D., *Professor of Plant Pathology*
RICHARD ENGLISH VAUGHAN, M.S., *Professor of Plant Pathology*
JOHN CHARLES WALKER, Ph.D., *Professor of Plant Pathology*
ALBERT JOYCE RIKER, Ph.D., *Associate Professor of Plant Pathology*
JOHN WILLIAM BRANN, M.S., *Assistant Professor of Horticulture and Plant Pathology*
JOHN JEFFERSON DAVIS, *B.S.*, M.D., *Curator of the Herbarium*
CLARICE AUDREY RICHARDS, Ph.D., *Lecturer in Forest Products*

Courses 104, 149, 220, 221, and 252 are offered in the Department of Botany, College of Letters and Science.

5. CROP DISEASES AND THEIR CONTROL. I; 2 cr. Lectures and demonstrations dealing with the occurrence, symptoms, and control of the more important diseases of the commonly cultivated crops. Lab. fee $2.25. Mr. Vaughan and staff.

100. THESIS. Yr; 2 cr. Investigation of some problem in plant pathology. Subject should be chosen early, preferably the preceding spring, in order to take advantage of the summer season to secure material. Lab. fee $2.25 per lab. cr. Staff.

101. DISEASES OF PLANTS. I; 3 cr. The nature, causes, and remedies of the diseases of economic plants, including field and laboratory studies of a typical series of examples. Prerequisites: Botany 1 and Agr. Bact. 1. Lab. fee $4.50. Mr. Walker, Mr. Gilbert.

102. METHODS IN PLANT PATHOLOGY. I; 3 cr. Isolation of parasites, technique of cultural methods, spore germination, and infection. Prerequisite: Plant Path. 101. Lab. fee $4.50. Mr. Riker.

104. MORPHOLOGY OF FUNGI. I; 3 cr. Prerequisite: Botany 1. Lab. fee $3.50. Mr. Gilbert.

116. DISEASES OF FIELD CROPS. II; 2 cr. Arranged to meet the needs of students in plant pathology and agronomy. Prerequisite: Plant Path. 101. Offered 1931-32 and in alternate years. Lab. fee $2.25. Mr. Dickson.

117. DISEASES OF ORCHARD FRUITS. II; 2 cr. A study of the more important diseases of deciduous orchard fruits. Prerequisite: Plant Path. 101. Offered 1931-32 and in alternate years. Lab. fee $2.25. Mr. Keitt.

119. DISEASES OF TIMBER. I; 2 cr. A survey of fungi causing rot in living trees and structural timbers, and control measures. Prerequisite: Plant Path. 101. Offered 1931-32 and in alternate years. Lab. fee $2.25. Miss Richards.

120. Diseases of Vegetable Crops. II; 2 cr. A study of the more important field and storage diseases of vegetable crops. Prerequisite: Plant Path. 101. Offered 1932-33 and in alternate years. Lab. fee $2.25. Mr. Walker.

122. Fungicides in Relation to Host and Parasite. II; 1 cr. Advanced course, primarily intended for students specializing in plant pathology and horticulture. Prerequisite: Plant Path. 101. Offered 1932-33 and in alternate years. Mr. Keitt.

149 Special Physiology of Pathogenic Fungi. II; 2 cr. Prerequisite: Botany 146. Mr. Duggar.

200. Research. Yr; *cr. Lab. fee $2.25 per lab. cr. Staff.

220. Advanced Mycology. Yr; 2 cr. Prerequisite: Botany 104. Lab. fee $2.00 per semester. Mr. Gilbert.

221. Classification of Parasitic Fungi. Yr; 1 cr. Prerequisite: Botany 104 or Plant Path. 101. Mr. Davis.

223. Seminary in Plant Pathology. Yr; 1 cr. For advanced and graduate students. Mr. Jones and staff.

252. Cytology of Fungi. II; *cr. Prerequisite: At least one semester of general cytology. Lab. fee $2.00 per cr. Mr. Gilbert.

STUDYING PLANT DISEASES

Farmers lose thousands of dollars each year through plant disease. Most plant diseases can be controlled or prevented.

POULTRY HUSBANDRY

JAMES GARFIELD HALPIN, B.S., *Professor of Poultry Husbandry, Chairman*
JOHN BARRY HAYES, B.S., *Associate Professor of Poultry Husbandry*
CLAYTON ERNEST HOLMES, B.S., *Instructor in Poultry Husbandry*
GERALD EVERETT ANNIM, B.S., *Instructor in Poultry Husbandry*

Students majoring in poultry husbandry may prepare for commercial poultry farming, for one of the various lines of commercial work with which poultry husbandry is related, or for educational work in extension, instruction, or research. Poultry majors should supplement their training by electing such courses as Animal Husbandry 126, Agr. Chem. 1 and 2, Agr. Econ. 127 and 128, and Genetics 101. Students preparing for educational work along the more scientific lines should elect Chemistry 120, Agr. Chem. 122, Zoology 105 and 109. Opportunities are provided for students majoring in poultry husbandry to become familiar with methods of poultry management by working at the University poultry plant, local hatcheries, etc. Not to exceed five credits from the following courses may be counted as a portion of the major requirement in poultry husbandry: Veterinary Science 125, Disease of Poultry; Animal Husbandry 126, Livestock Feeding; Agricultural Chemistry 122, Animal Chemistry; Agricultural Economics 127, Cooperative Marketing; Agricultural Economics 128, Marketing Farm Products; and Genetics 105, Animal Genetics.

1. POULTRY RAISING. I; 3 cr. A general survey course designed to give the student an understanding of the various problems concerned in poultry raising. Emphasis is given to the study of the various breeds and varieties, breeding and selection for egg production. Optional subject for all agricultural students. Lab. fee $2.25. Mr. Holmes.

2. POULTRY FEEDING. II; 2 cr. A study of the feeding and management of poultry. Mr. Holmes.

5. INCUBATION AND BROODING. II; 2-3 cr. Designed to give poultry majors and other students interested in artificial incubation and brooding an understanding of the factors influencing the hatchability of eggs; a practical study of embryology; practical problems in the operation of incubators and brooders. Prerequisite: Poultry Husbandry 2 or concurrent registration. Lab. fee $2.25 per lab. cr. Mr. Holmes.

8. MARKETING POULTRY PRODUCTS. I; 2 cr. A consideration of those factors tending to produce quality in market poultry. Laboratory practice in fattening, dressing, grading, and packing various classes of market fee $2.25 per lab. Cr. Staff.

119. DISEASES OF TIMER I; 2 cr. A survey of fungi causing rot in living poultry; a consideration of those factors tending to produce quality in market eggs. Laboratory practice in candling, grading, and packing market eggs; methods of marketing poultry products. Prerequisite: Poultry Husbandry 1. Lab. fee $2.25. Mr. Holmes.

100. THESIS. Yr; 2 cr. Mr. Halpin, Mr. Holmes.

106. POULTRY JUDGING. I; 3 cr. Origin, history, and points of excellence of the various breeds and varieties of poultry as described in the American Standard of Perfection. A study of the inheritance of common characters in poultry. Prerequisites: Poultry Husbandry 1 or Genetics 101. Lab. fee $2.25. Mr. Halpin.

107. ADVANCED POULTRY MANAGEMENT. II; 3 cr. Influence of recent investigations in poultry husbandry as they affect modern methods of feeding, housing, breeding, care and management of poultry. Special emphasis on rations and practices where poultry is kept on a large scale. Prerequisites: Poultry Husbandry 1 and 2 or Animal Husbandry 126. Mr. Halpin.

200. RESEARCH PROBLEMS. Yr; *cr. Lab. fee $2.25 per lab. cr. Mr. Halpin, Mr. Holmes.

RURAL SOCIOLOGY

JOHN HARRISON KOLB, Ph.D., *Professor of Rural Sociology, Chairman*
ELLIS LORE KIRKPATRICK, Ph.D., *Associate Professor of Rural Sociology*
ARTHUR F. WILEDEN, M.S., *Assistant Professor of Rural Sociology*

The courses in this department are intended to give a broad view of group life and activities in relation to rural social institutions such as family, church and school. Attention is given to the elements composing and the factors affecting standards of living in rural communities. Emphasis is placed on research and extension aspects of particular problems within the field.

Students majoring in this department will be expected to take courses 25, 100, 126, 200 and 225. They must take course 1 and may take other courses in the Department of Sociology in the College of Letters and Science. In addition they may take not to exceed 5 credits from the following courses to apply on their major: Agricultural Economics 8, 10, 107, 117, 127, 128, 150 and 152; Agricultural Education 1, 5 and 110, Agricultural Journalism 1, 103 and 111 and Horticulture 6 and 126.

25. RURAL LIFE. I; 3 cr. The rural life movement with special attention given to the group organization or rural society; rural social institutions, such as the family, the school, the church, social and welfare agencies; principles and policies of rural community organizations. Prerequisite: Sophomore standing. Mr. Kolb.

100. THESIS. Yr; 2 cr. Original work on problems pertaining to rural communities. Staff.

126. RURAL STANDARDS OF LIVING. II; 2 cr. Development of standards of living in rural communities. Consideration of all elements composing the standard of living: food, housing, transportation, education, religion, art, and recreation, in relation to income, trading centers, social institutions, and local groupings. Prerequisite: Junior standing. 3:30-5:30 Tu. Mr. Kirkpatrick.

200. RESEARCH. Yr; *cr. Rural social organization and rural life, Mr. Kolb; Rural standards of living, Mr. Kirkpatrick.

225. SEMINARY IN RURAL SOCIAL ORGANIZATION. I; 2 cr. The theory and practice of rural social organization related to rural population groups, to villages and small town groups, and to towns and county organization policies. Emphasis is given to research methods of study. Prerequisite: Agr. Econ. 25. Mr. Kolb.

SOILS

ANDREW ROBINSON WHITSON, B.S., *Professor of Soils, Chairman*
CLINTON JOSEPH CHAPMAN, B.S., *Professor of Soils*
FRED LUDWIG MUSBACH, B.S., *Professor of Soils*
EMIL TRUOG, M.S., *Professor of Soils*
EDWARD JOHN GRAUL, M.S., *Associate Professor of Soils*
OTTO REINHART ZEASMAN, B.S., *Associate Professor of Soils and Agricultural Engineering*
ARTHUR ROBERT ALBERT, *B.S., Assistant Professor of Soils*
RUSSELL HAYDEN AUSTIN, Ph.D., *Assistant Professor of Soils.*
HAROLD HAIGHT HULL, M.S., *Instructor in Soils*

Soils 1 is prerequisite to all other courses in soils. Soils 122 may be elected by middle course sophomores. Soils 1 and 120 are general in character and are adapted to the needs of all students of agriculture. Advanced students specializing in this subject are advised to elect courses in chemistry, soils bacteriology, plant physiology, agronomy, or geology, according to their special needs, during their senior and graduate years. The summer period is particularly suited to advanced work in soil fertility; for courses offered see summer session bulletin.

GENERAL MAJOR. Students majoring in soils and preparing for practical farming, positions as farm manager, teacher of agriculture, or county agricultural agent, should follow Curriculum B, taking Physics 61, 5 cr., Botany 146, 4 cr., and science or mathematics, 5 cr.; and select the courses in soils in the following order: For the sophomore year, 1, 5 cr.; 122, 3 cr.; for the junior year, 120, 2 cr.; for the senior year, 127, 2 cr.; 128, 2 cr.; and thesis, 4 cr., or 121, 4 cr. In addition to these suggestions, students are urged to elect courses in the Departments of Agronomy, Botany, Agricultural Economics, Agricultural Engineering, Animal Husbandry, Bacteriology, and Geology to supplement the required work in soils. General majors desiring to teach should consult the chairman of the Department of Agricultural Education concerning requirements not later than the beginning of the junior year.

TECHNICAL MAJOR. Students desiring to prepare for the work of soil surveying, land classification, or field experimentation should follow the general suggestions given above for the general major, but choose supplementary electives from the following group: Agr. Engr. 5, 102; Agronomy 102, 106, 120; Botany 109; Chemistry 11 or 12; Geology 1, 11; Soils 121.

Students preparing to become soil chemists should take Curriculum B with Soils 1, 5 cr., and Soils 122, 3 cr., in the sophomore year; Soils 127, 2 cr., and Soils 121, 4 cr., in the junior year; and Soils 120, 2 cr., Soils 125, 3 cr., Soils 100, 4 cr., and Soils 128, 2 cr. in the senior year. In addition, Chemistry 12, 3 cr., Zoology 3, 3 cr., Geology 2, 3 cr., Agronomy 106, 3 cr., should be elected in the sophomore year; Chemistry 120, 3 or 5 cr., and a language in the junior year; and Agr. Bact. 123, 4 cr., Chemistry 130, 5 cr., Agronomy 102, 2 cr., in the senior year.

Students are urged to consult a member of the department not later than the second semester of their sophomore year so that a logical sequence of courses may be arranged. Agr. Bact. 123, Soils bacteriology, will be considered as a part of the major.

A STUDY OF THE PROBLEMS OF THE SOIL

Students may take laboratory practice on soils in this room and carry on investigations on soils from the home farm.

1. PRINCIPLES OF SOIL FERTILITY. I; 5 cr. Discussions and laboratory work on the formation, composition, tilth, and fertility of soils in relation to the growth of plants. Prerequisite: Chemistry 1b or concurrent registration. Lab. fee $4.50. Mr. Graul and staff.

100. THESIS. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Mr. Whitson and staff.

120. SOIL MANAGEMENT. I; 2 cr. Lectures and field work, maintenance of fertility, including principles of fertilizer practice, and adaptation of system of agriculture to type of soil and climate. Prerequisite: Soils 1. Mr. Whitson.

121. SOIL ANALYSIS. II; 4 cr. Lectures and laboratory. Soil acidity methods, limestone analysis, determination of essential elements, availability methods, complete soil analysis. The use of chemical analysis in soil diagnosis. Prerequisites: Soils 1, Chemistry 12. Lab. fee $4.50. Mr. Truog.

122. SOIL PHYSICS AND TILLAGE. II; 2-3 cr. Lectures and laboratory. The physical properties of the soil constituents, tilth, soil moisture, heat, in relation to the growth of plants, with practical applications to farm practice. Prerequisite: Soils 1. Lab. fee $2.25 per lab. cr. Mr. Graul.

125. SOIL AND LAND CLASSIFICATION; AGRICULTURAL CLIMATOLOGY. II; 3 cr. Lectures and field work in soil mapping. The principles of climatology and soil and land classification in relation to agriculture, including a study of the soils and climate of the United States and of the chief foreign countries. Prerequisite: Soils 1 or graduate standing. Mr. Whitson.

127. SOIL SCIENCE AND PLANT NUTRITION. I; 2 cr. Lectures and discussions. The constitution of the soil, especially as a medium for plant growth. The newer applications of scientific principles to such problems as soil acidity, use of fertilizers, soil amendments, and toxic agents. Prerequisite: Soils 1 or graduate standing. Mr. Truog.

128. SEMINARY IN SOILS. I, II; 1 cr. Mr. Whitson, Mr. Truog.

180. TOPICAL WORK. Yr; *cr. Mr. Whitson, Mr. Truog, Mr. Graul.

200. RESEARCH. I, II; *cr. Lab. fee $2.25 per lab. cr. Mr. Whitson, Mr. Truog, Mr. Graul.

228. FIELD COURSE. Yr; 2-4 cr. Soil and crop rotation problems, soil acidity and legumes, farm soil survey, factors determining fertility balance sheet, planning and use of experimental and demonstrational fertilizer plots. Prerequisite: Soils 1. Mr. Whitson, Mr. Musbach, Mr. Albert.

VETERINARY SCIENCE

FREDERICK BROWN HADLEY, D.V.M., *Professor of Veterinary Science, Chairman*
ALEXANDER SEPTIMUS ALEXANDER, F.H.A.S., M.D.C., *Professor of Veterinary Science*
BURR ABRAHAM BEACH, D.V.M., *Associate Professor of Veterinary Science*
CHARLES ROY STRANGE, D.V.M., *Instructor in Veterinary Science*

The courses described below have been planned to give the students an appreciation of the various branches of veterinary science. They are taught largely by the laboratory method. Besides giving information needed for the intelligent care and management of sick animals, they aid advanced students to secure a knowledge of animal breeding, animal pathology, and veterinary bacteriology.

1. THE ANIMAL BODY. I; 3 cr. The structure, functions, and derived products of the animal body. The student learns about the form, capacity and productivity of farm animals as well as the fundamentals relative to their feeding and breeding. Optional subject for all agricultural students. Lab. fee $4.50. Mr. Hadley.

2. NON-INFECTIOUS DISEASES OF LIVESTOCK. I; 2 cr. Their causes, symptoms, prevention, and treatment, including conformation and soundness. Mr. Hadley.

100. THESIS. Yr; 2 cr. Mr. Hadley, Mr. Beach.

123. INFECTIOUS DISEASES OF LIVESTOCK. II; 2 cr. Their causes, diagnosis, control and eradication. Prerequisite: A course in veterinary science or bacteriology. Mr. Hadley.

124. TOPICAL WORK. Yr; *cr. Assigned work for advanced students. Mr. Hadley and staff.

125. DISEASES OF POULTRY. II; 2 cr. A study of the more common diseases of poultry. Prerequisite: Vet. Science 1 or Poultry Husb. 1. Offered (1931-32) and in alternate years. Mr. Beach.

126. INFECTION AND IMMUNITY. II; 3 cr. An experimental study of the principles of infection and immunity. Prerequisite: A course in bacteriology: Offered 1930-31 and in alternate years. Lab. fee $4.50. Mr. Hadley and staff.

200. RESEARCH. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Mr. Hadley, Mr. Beach.

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