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BULLETIN
of the
UNIVERSITY *of* WISCONSIN



COLLEGE OF AGRICULTURE
ANNOUNCEMENT OF COURSES
1944-1946

MADISON, WISCONSIN
JULY, 1944

Bulletin of the University of Wisconsin

Serial No. 2723

General Series No. 2507

July, 1944

COLLEGE OF AGRICULTURE

ANNOUNCEMENT OF COURSES

1944-1946

THE BULLETIN OF THE UNIVERSITY OF WISCONSIN IS ISSUED MONTHLY AND IS ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE AT MADISON, WISCONSIN, UNDER THE ACT OF CONGRESS OF AUGUST 12, 1912.

PUBLISHED AT MADISON, WISCONSIN

JULY, 1944

CALENDAR

FIRST SEMESTER

1944-45

Sept. 18, 19	Examinations for admission
Sept. 20-23	Freshman period (attendance required)
Sept. 21-23	Registration days for other new students
Sept. 22, 23	Registration days for old students
Sept. 25	Instruction begins
Sept. 26	Examinations for removal of conditions
Sept. 30	Placement examinations for late freshmen and transfers
Oct. 7	Foreign-language attainment examinations
Nov. 30	Thanksgiving Day: legal holiday (1 day only)
Dec. 9	Examinations for removal of conditions
Dec. 23 (noon)	Christmas recess commences
Jan. 1	Instruction resumes
Jan. 1	New Year's day (Classes as usual)
Jan. 6	Foreign-language attainment examinations
Jan. 15-20	Final examinations

SECOND SEMESTER

Jan. 22, 23	Examinations for admission
Jan. 23	Registration day for new and reentered students
Jan. 24	Instruction begins
Jan. 27	Placement examinations for new students
Feb. 10	Examinations for removal of conditions
April 12	Spring recess commences
April 16	Instruction resumes
April 21	Examinations for removal of conditions
May 5	Foreign-language attainment examinations
May 16-22	Final examinations
May 26	Commencement Day

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COLLEGE OF AGRICULTURE

The College of Agriculture performs three distinct functions for the citizens of Wisconsin:

(1) It provides, with the cooperation of the other schools and colleges of the University, collegiate instruction in agriculture and its related fields; (2) it conducts, through the organization of its Experiment Station, research in the natural and social sciences as they relate to agriculture and homemaking; and (3) it disseminates to the farmers and homemakers of the State, through its Agricultural Extension organization, information on the latest research findings that pertains to the problems of farming and homemaking. The content of this bulletin deals exclusively with the instructional function of the College of Agriculture.

OPPORTUNITIES IN AGRICULTURE

Young men, particularly those with a farm background or those who have lived in rural communities and understand rural problems, will find many opportunities in the broad field of agriculture. These opportunities fall into four general classifications, namely: (1) farming; (2) agricultural teaching and extension work; (3) agricultural commerce and industry; and (4) agricultural research.

FARMING—There is opportunity for success in farming. The agricultural college graduate may be trained in the application of modern up-to-date methods which today are indispensable to profitable farming. He has had an opportunity to broaden greatly his perspective and to increase his capacity to deal effectively with farm problems. Consequently, the qualified graduate may do well in a managerial capacity for another farm owner or in directing his own farming enterprise.

TEACHING AND EXTENSION WORK—In many rural communities, Smith-Hughes vocational agriculture instructors are teaching high-school youth the techniques of improved scientific farming methods. County agricultural agents, agricultural college extension specialists, and agricultural extension representatives in the United States Department of Agriculture are effectively disseminating among the farm youth and farmers of the various states information on the latest agricultural methods and practices made available by the agricultural experiment stations. Only men with adequate farm background and good training in an agricultural college may hope for placement in agricultural teaching or extension work.

AGRICULTURAL COMMERCE AND INDUSTRY—In the business world a considerable demand for agricultural college graduates exists. Private and governmental financial institutions engaged in farm loan activities, and newspaper, advertising and radio broadcasting agencies have taken many agriculturally trained graduates. Others have been absorbed by canning, feed and seed, fertilizer, dairy products, meat packing, commercial hatchery, and farm implement companies.

AGRICULTURAL RESEARCH—Agricultural experiment stations and various federal and privately owned agencies find need for trained men who have specialized in some one phase

COLLEGE OF AGRICULTURE

of natural or social science relating to agriculture. To equip himself best for a position in the field of agricultural research, a student should continue his study beyond the usual four years of college and plan to earn a master's or doctor-of-philosophy degree in the field of his special interest.

FACILITIES AND STAFF

The College of Agriculture possesses splendid physical facilities for conducting its research and instructional work. Prepared to provide training in nineteen related agricultural fields, the College of Agriculture has a staff of more than 125 highly-trained men of professorial rank.

CAMPUS ACTIVITIES

Students enrolled in the College of Agriculture will find several active student organizations on the agricultural campus. In addition to maintaining the *Wisconsin Country Magazine*, student monthly publication, from which those who are interested may receive rich, practical experiences in writing, soliciting advertising, circulation problems, newspaper financing, or editing, students also support the following organizations:

Alpha Zeta—A chapter of the national honorary agricultural fraternity; *Agricultural Engineers*—for students in agricultural engineering; *Babcock Dairy Science Club*—for students interested in dairy industry; *Badger Conservation Club*—for students interested in forestry, nature, and conservation; *Blue Shield*—a club for students interested in rural life and those who want to become rural workers and leaders; *Future Farmers of America*—a collegiate club consisting of former F.F.A. members and others who plan to teach vocational agriculture; *Landscape Council Ring*—an organization for students in landscape gardening; *Saddle and Sirloin Club*—for students interested in the breeding of livestock. This club sponsors the annual Wisconsin Little International Livestock Show and provides financial support for the various stock judging teams which represent the College of Agriculture in collegiate judging competition at the American Royal, International Livestock, and National Dairy Shows; *U. W. 4-H Club*—former 4-H Club members comprise the membership of this group; and *U. W. Poultry Club*—for students interested in poultry breeding.

Serving to integrate the activities of the above-mentioned agricultural organizations, in addition to those which are open only to students in Home Economics, is the *Agricultural Student Council* which has two representatives from each of the established groups. The council sponsors all of the agricultural campus all-student functions and seeks to promote a closer relationship between the faculty and student body.

ADMISSION

Requirements for admission will be found in the General Information Bulletin.

STUDENT EXPENSE

For information regarding living costs, tuition and fees, and student employment, consult the General Information Bulletin.

LOAN FUNDS AND UNDERGRADUATE SCHOLARSHIPS

Students should consult the General Information Bulletin for a list of available scholarship and loan funds. Many of these are open to all students in the University while others are limited. Attention is directed to the funds establishing scholarships and loans for students in Agriculture.

Thirteen scholarships of \$100 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.

Henry Steenbock Fellowship—Endowed by Professor Harry Steenbock and his sister, Mrs. Robert Bruce Brinsmade, in honor of their father, for seniors in Agriculture.

Agricultural Loan Fund—For information address the Assistant Dean, College of Agriculture.

E. R. Jones Loan Fund—For students in the College of Agriculture.

Henry A. and Minnie P. Huber Scholarship Loan Fund—For scholarship loans to farm boys and girls who are interested in the study of agriculture and farm management.

Agricultural Student Council Loan Fund—For students enrolled in the College of Agriculture.

For further information regarding the above loans or scholarships or Babcock House, write Assistant Dean V. E. Kivlin, College of Agriculture, Madison 6, Wisconsin.

ROOM AND BOARD

THE UNIVERSITY RESIDENCE HALLS

Halls For Men. The university halls for men are on Lake Mendota away from the city, yet only a short distance from class and lecture, in a beautiful natural setting. The location has every physical advantage: The lake offers many opportunities for summer and winter recreation; the university intramural playing fields are adjacent; there is the privacy of a little community, with inclusion in the University as a whole. The halls are modern and fireproof, the student rooms attractive and well furnished. (See General Information Bulletin for complete information.)

The Wisconsin Union. In the Union the University provides a variety of dining services for students, operated on a cost basis and under the supervision of trained dietitians. The combined dining rooms in the Union accommodate 3,500 students a day; the cafeteria, the largest room, serves three meals daily, featuring a low cost student special. Every type of dining preference is met by the Union and costs are very low.

Cooperative Houses For Men. The University owns and operates five cooperative houses for men located in the first block east of the campus near the library, the Wisconsin Union, the gymnasium, student churches, the lake, tennis courts, and the business district. Together they accommodate 120 men.

The Babcock House, a cooperative house for men students in the College of Agriculture, is but two blocks from the University campus. Managed by an upperclass student in Agriculture, who confers with a faculty counseling committee, this house provides board and room for the student at a cost of \$190 to \$200 per year. Residents of the house, approximately 38 in number, do a certain amount of work each day in order that living costs may be kept low. Further information may be secured by writing to the Assistant Dean, V. E. Kivlin, College of Agriculture, Madison 6, Wisconsin.

SELF-SUPPORT

The University Student Employment Bureau is maintained to assist men and women students who are partly or wholly self-supporting during their attendance at the University. More than half of the students at the University of Wisconsin must depend upon themselves for part or all of their resources.

A student should not expect to secure a definite job before he arrives in Madison to stay. The employer usually requires a personal interview. He often wants help on very short notice so that it is necessary to send a student who is in Madison and ready for immediate employment. The number of applicants is far greater than the number of available jobs.

THE LONG COURSE

OBJECTIVES—The Long Course in Agriculture is the regular four-year collegiate course leading to the degree of Bachelor of Science in Agriculture. Four years of university work or its equivalent, is necessary to complete the work for a degree. Serving a two-fold pur-

pose, namely, to give a broad, general training and a specific technical knowledge of agriculture, the Long Course prepares students for the more desirable commercial, managerial, and professional positions.

ADMISSION—The four methods by which one may be admitted to the Long Course in the College of Agriculture are the same as for any other college or school in the University. See General Information bulletin, pages 20-27.

FEES, BOOKS, AND MISCELLANEOUS COSTS—The student in agriculture who is a resident of the state of Wisconsin should expect to spend from \$60 to \$75 each semester for his general fees and books. The only additional expenses the student need be concerned about are board, room, clothes, laundry and entertainment. For further details see General Information bulletin, pages 2-4.

MAJORS—Each student enrolled in agriculture has two choices in planning his curriculum: (1) He may take his major work in one department which requires that he have a minimum of 15 and a maximum of 25 elective credits in the department; or, (2) he may choose to specialize in a field of work involving two or more departments; in this case he will take a split major which requires that he have a minimum of 25 elective credits of suitably related work in two or more departments. For either the department major or the split major, a maximum of 25 credits in any one department, is allowed toward graduation. This includes the four credit thesis, if a thesis is required.

In planning a course of study the student should make certain that he includes all the courses required for a degree, including the major requirements of a minimum of 15 *elective* credits in the department. The staff members of any department will be glad to discuss with prospective majors the opportunities which their particular field has to offer and recommend the courses that ought to be taken in preparing for a specific objective.

SPLIT MAJORS—A split major is designed for the individual who wishes to prepare himself in a field of study involving courses in two or more departments. A series of split majors approved by the Executive Committee may be found on pages 38-46. Other plans for split majors may be worked out, but *any new plan must be submitted to the Executive Committee for approval before the middle of the junior year.*

LONG COURSE A FLEXIBLE COURSE OF STUDY

The Long Course is designed to permit the student to have a liberal selection of subjects. The only subjects which the Long Course student *must* take to fulfill the requirements for graduation are those listed below which normally are taken in the freshman and sophomore years. Beyond those, the student may select any undergraduate subjects to which he is eligible, in any part of the University he chooses, provided: (1) he takes a minimum of 45 (50)* *elective and required* credits within the College of Agriculture; (2) he takes a minimum of 20 (24)* *elective* credits outside the College of Agriculture and (3) he satisfies the requirements for a major.

An outline of the course of study for a four-year period is given herewith. A total of 124 (133)* credits and 124 (133)* grade-points is required for graduation. *The reader should give particular attention to notations included beneath each year's curriculum.*

THE LONG COURSE

FRESHMAN YEAR			
First Semester	Credits	Second Semester	Credits
English 1a—Freshman composition	3	English 1b—Freshman composition ¹	3
Chemistry 1a—General chemistry	5	Chemistry 1b—Qualitative analysis	5
Agronomy or Animal-Dairy Husb. ²	3	Agronomy or Animal-Dairy Husb.	3
Elective (a)	3-5	Elective (b)	3-5
Freshman Lectures ³	1	Military Science	0
Military Science	0	Physical Education	0
Physical Education ⁴	0		
	15-17		14-16

SOPHOMORE YEAR			
Agr. Bact. 1—General survey	4	Agr. Economics 1—Prin. of agr. econ. ²	3
Econ. 1a—General economics	4	Biochemistry 1—Elem. biochem. ⁵	4
Soils 1—Soils and soil fertility ⁵	4	Elective (d)	3-5
Elective (c)	3-5	Electives	4
Military Science	0	Military Science	0
Physical Education	0	Physical Education	0
	15-17		14-16

* Figures in parentheses () apply to students in agriculture who entered college before September 1, 1939.

¹ Students earning a grade of A in English 1a may be excused from English 1b. They may even be exempt from the full year of freshman English provided they pass the exemption tests which are given during the second week of residence.

² Students majoring in landscape gardening may substitute Art Education 50 for Animal Husbandry 1 and may take Agricultural Economics 117 in place of Agricultural Economics 1.

³ See information on Freshman Lectures on page 15.

⁴ See information on Military Science and Physical Education Requirement on page 15.

⁵ A choice is offered between Soils 1 and Biochemistry 1. Only one is required but both may be taken if desired.

Electives a, b, c, and d must include *four* courses totaling from 12-20 credits from the following:

Mathematics	2 courses or a maximum of 10 credits
Physics 1	2 courses or a maximum of 10 credits
Botany 1	Not more than 1 course, or maximum of 5 credits
Zoology 1	Not more than 1 course, or maximum of 5 credits
Agricultural courses	1 or 2 courses but if 2 courses are taken they must be selected from different departments

JUNIOR AND SENIOR YEARS

The student ordinarily will carry from 15 (16)* to 17 (18)* credits per semester during his junior and senior years. At the beginning of his junior year the student, with the help of his adviser, should plan a program, well balanced with respect to elective and required subjects, especially in the major or split major, so that he may easily complete all of the requirements for the degree during the senior year. (See page 16.)

PRE-FORESTRY

The University of Wisconsin does not offer a course in forestry. However, it does offer, in the College of Agriculture, two years of work in pre-forestry study. Upon the satisfactory completion of the pre-forestry course, a student may transfer to another institution where forestry is given and there complete his work toward a degree in forestry.

The pre-forestry work suggested is similar to the prerequisite training required by most forestry schools. However, it is advisable that the student, in the spring semester of his freshman year, confer with his adviser relative to the forestry institution he should plan to attend after he will have completed his two-year pre-forestry course. This will enable the student and his adviser to plan more thoroughly the student's course of study for his sophomore year at the University of Wisconsin. Practically all institutions that offer degrees in forestry require that training in the summer forestry camp be completed before

COLLEGE OF AGRICULTURE

the beginning of the junior year. The following curriculum for the freshman year is recommended for students intending to take forestry:

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
Agron. 1—Princ. and practices in crop production	3	Botany 1—General botany	5
Math. 1a—Algebra or Math. 3a— Algebra and trigonometry	4	Econ. Ent. 1—Elem. ent. (Farm insects)	3
Freshman Lectures	1	Military Science ¹	0
Military Science ¹	0	Physical Education	0
Physical Education	0		

¹ See information on Military Science and Physical Education requirement on page 15.

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SOPHOMORE YEAR

The subjects chosen during the sophomore year should be those that will conform to the requirements of the institution to which the student hopes to transfer and complete his work in forestry.

The U. S. Forest Products Laboratory, cooperating with the University of Wisconsin, in addition to giving the subjects, General Forestry 1, and Wood Technology 102, which are offered as agricultural electives, also gives other courses which deal with the study of wood, its properties and uses. See courses listed on page 30.

PRE-VETERINARY

The University of Wisconsin confers no Doctor of Veterinary Medicine degrees. The leading institutions that do confer such degrees require their students to have had at least one year of general college work to prepare them for the more highly specialized veterinary studies. The present tendency is to require a minimum of two years of pre-veterinary work. It is important for prospective veterinary science students to know that veterinary colleges operate on a restricted enrollment basis. Only the student who ranks high scholastically while taking his pre-veterinary work, may expect to gain admission to a veterinary college.

Normally, a student in a veterinary college is required to take four years of professional study regardless of the number of years of pre-veterinary study he may have had. To enable residents of Wisconsin to get the necessary college work that will qualify them for entrance to a veterinary college, the College of Agriculture offers the following pre-veterinary course:

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
Zoology 1—Animal biology	5	An. or Dy. Husb. 1—Livestock production	3
Electives	0-2	Botany 17 or 1	3-5
Freshman Lectures ¹	1	Military Science ²	0
Military Science ²	0	Physical Education	0
Physical Education	0		

¹ See information on Freshman Lectures on page 15.

² See information on Military Science and Physical Education requirement on page 15.

14-16

SOPHOMORE YEAR

In addition to such subjects as Agricultural Economics 1 or 8, Biochemistry 1, Dairy Industry 3, Economics 1a, Genetics 1, Mathematics 1, and Speech 1 or 7, it is recommended that the student select courses which will provide a suitable background for work in the field of veterinary science.

The cost of each year of study will be the same as for any year of study in the Long Course. (See page 10.)

MISCELLANEOUS RULES AND REGULATIONS

FOR FRESHMEN

Freshman Lectures—All students in agriculture are required to take this course, which allows one credit. The course should be taken during the first semester of the freshman year. Only transfer and advanced standing students who enter the course in agriculture with sophomore standing or above shall be excused from this requirement.

Military Science and Physical Education Requirement—All male freshmen are required to enroll in military science at the time of registration with the provision that the following will be exempted from taking military science: (a) students who qualify and are accepted for membership in the Regimental Band; (b) students who do not meet the established physical requirements for military science as certified by the Student Health department; and (c) students who for other reasons are exempted or excluded by the Department of Military Science. Subject to the aforementioned conditions governing enrollment in military science, undergraduate men are required to complete: (1) Two hours of physical education per week for freshmen and sophomores and (2) Three hours of military science for four semesters. (Additional information may be found in the first-semester time table.)

FOR SOPHOMORES

Majors—Majors should be chosen not later than the close of the sophomore year in order that the student may secure a well-balanced training. For majors and split majors see page 12, and pages 38-46.

Sophomore Honors and Sophomore High Honors are awarded on the basis of a minimum of two full years of work, not less than 60 credits, completed in residence, in the College of Agriculture for the first half of the four-year course. A student who earns, during these two years, 135 grade-points plus one and one-half grade-points for each credit above 60, will be awarded Sophomore Honors. A student earning 165 grade-points, plus two grade-points for each credit above 60, during these two years, will be awarded Sophomore High Honors.

FOR JUNIORS

Major Requirements—Juniors should plan their study schedules so that they will begin to meet the requirements for their majors. See page 12.

Advanced Independent Work—A student who has taken his freshman and sophomore work in the College of Agriculture, whose grade-point average for these first two years of study is 2.6 or higher may be eligible to take Advanced Independent Work during the remainder of his course which will enable him to secure a master's degree at the end of nine semesters. For details see pages

FOR SENIORS

Senior Summary—Students beginning their first semester of work in the senior year are given their senior summaries at the assistant dean's office before they make out their study schedules so that they may check their past work and be certain that all the requirements for graduation will be satisfied after completing the senior year's work.

Senior Honors and Senior High Honors are awarded on the basis of a minimum of two full years of work, not less than 60 credits, completed in residence in the College of Agriculture, for the second half of the four-year course. The student who earns, during this two-year period, 135 grade-points plus one and one-half grade-points for each credit above 60, will be awarded Senior Honors. The student earning 165 grade-points, plus two grade-points for each credit above 60 during these two years, will be awarded Senior High Honors.

Senior-Graduate—Seniors in the College of Agriculture who are within six credits of having completed all the requirements for graduation and who have the minimum required grade-point average of 1.5 may be admitted to the Graduate School and earn residence credit to apply toward an advanced degree at the same time they are completing their requirements for the bachelor degree.

MISCELLANEOUS RULES AND REGULATIONS

FOR ALL STUDENTS

Although the rules are, in general, the same for all students in agriculture, there are a few exceptions. Students who entered college before September 1, 1939, are governed by rules slightly different than those prevailing where students entered after September 1, 1939. In the rules given under the following three sub-headings, namely: *Requirements for Graduation, Minimum and Maximum Study Loads, and Promotions*, the statements are applicable to all students. Figures shown in parentheses () are the only exceptions and they apply to students who entered college before September 1, 1939, only.

Requirements for Graduation—1—Completion of the required courses as indicated on pages 12-13. 2—A total of 124 (133)* credits and 124 (133)* grade-points. 3—No unsatisfied failures, conditions, or incompletes. 4—An average of one grade-point per credit during the last two semesters of work. 5—A major of 15 to 25 credits in a department or a split major of 25 or more credits of suitably related work in two or more departments. Not more than 25 elective credits in one department may count toward graduation. 6—A minimum of 20 (24)* elective, or non-required, credits outside the College of Agriculture. 7—A minimum of 45 (50)* credits including required, optional, major and elective courses within the College of Agriculture.

Minimum and Maximum Study Loads—Each student is required to take class and laboratory work totaling from 12 (12)* to 17 (18)* credits per semester, including freshman lectures and the military science or physical activity requirement as required of all freshmen. (See preceding page.) A student desiring to take less than 12 (12)* or more than 17 (18)* credits must get permission in advance from the Executive Committee of the College.

Promotions—A student becomes a sophomore on the completion of 25 (26)* credits and 25 (26)* grade-points; a junior on the completion of 58 (60)* credits and 58 (60)* grade-points; and a senior on the completion of 88 (95)* credits and 88 (95)* grade-points.

Course Restrictions—(1) Freshman and sophomore students are not permitted to take courses numbered 100 or above offered in the College of Agriculture but may take courses outside the college on the same basis as other students are permitted to enroll in them; undergraduates may not take courses numbered 200 or above. (2) Undergraduates below the rank of senior, excepting juniors who are eligible for advanced independent work, are not permitted to carry topical work. (3) Undergraduates may not receive credit for more than two semesters of seminar in a single department.

Advisers—After completing the freshman year, a student in agriculture may select any member of the agricultural teaching staff to be his adviser. The student reserves the right to change his adviser at any time after the completion of the semester and before beginning the next one. However, when the student is a senior his adviser must be a member of the department in which the student is majoring.

Quality of Work—To remain in good scholastic standing, a student is expected to maintain a minimum average of C (1.0) in all of the subjects which he is taking.

Failures—Unless he is excused from doing so by the Executive Committee, any student who receives a grade of "fail", indicated by "F", must remove the failure by repeating the subject and securing a passing grade as soon as the subject is again offered during the period such student is in residence at the University. A course that has been failed shall take precedence over other courses in being fitted into the student's study schedule when it is next offered. A failure cannot be removed by correspondence study or by repeating the subject at another collegiate institution.

Conditions—A student who receives a grade of "condition", indicated by "E", may convert it to a passing grade by passing a special examination during the next semester he is in residence at the University. Otherwise the grade will lapse into a failure which must be removed as specified above.

Incompletes—A student who receives an "incomplete", shown as "Inc", must complete the subject not later than the close of the semester in which it is again offered during the student's residence at the University. If not so completed, the grade for the subject will lapse into a failure unless the time for completion has been extended by the Executive Committee.

Change of Schedule—Any change in the student's schedule, however small or seemingly insignificant, must be requested by the student's going to his adviser, indicating his request, and securing his adviser's approval on the proper forms, and taking the forms to the assistant dean's office where the Executive Committee will either approve or reject the request. Any course dropped without the permission of the Executive Committee will be recorded as a "fail", and must be removed in the same manner as any other failure, as specified above.

Thesis—The undergraduate thesis when required as part of the major requirement, shall consist of no more and no less than four credits.

Agricultural and Non-Agricultural Courses—Courses taken outside the College as a part of the major are not considered as a portion of the 45 (50)* credits required in the College of Agriculture. Courses taught in departments outside the College of Agriculture, though listed in departments of the College of Agriculture, are not to be considered as part of the 45 (50)* required credits. Courses given by staff members of the Forest Products Laboratory, approved by the College of Agriculture, shall be considered as agricultural. Credits in Education 75 may be counted toward graduation only by those students who complete the requirements for the university teachers' certificate.

* Figures in parentheses () apply to students in agriculture who entered college before September 1, 1939.

OTHER COURSES IN COLLEGE OF AGRICULTURE

HOME ECONOMICS COURSE

A four-year course in Home Economics leading to the degree of Bachelor of Science (Home Economics) is given at the University under the direction of the College of Agriculture. A bulletin containing detailed information on the course in Home Economics may be obtained by writing to the Director of Home Economics, Home Economics Building, Madison 6, Wisconsin.

GRADUATE WORK IN AGRICULTURE AND HOME ECONOMICS

Graduate work is offered in each of the nineteen departments in Agriculture and in the Department of Home Economics. Students wanting to take work toward a master's or doctor-of-philosophy degree will enroll in the Graduate School. For further details and information relating to scholarships and fellowships, procure Graduate School bulletin from the Dean of the Graduate School, Bascom Hall, Madison 6, Wisconsin.

THE FARM SHORT COURSE

The Farm Short Course is designed for young men between the ages of 19 and 26 years, who expect to farm. Covering two winter periods of 15 weeks each, the course, which is held from the middle of November to the middle of March, provides training in both the natural and social sciences as they relate to the problems of Wisconsin farmers. The satisfactory completion of the work offered in the Farm Short Course entitles one to a certificate awarded by the University of Wisconsin. Further information, including a bulletin, may be obtained by writing to the Director of the Farm Short Course, College of Agriculture, Madison 6, Wisconsin.

THE WINTER DAIRY COURSE

To train men in the dairy industry to understand the more modern manufacturing methods, the College of Agriculture provides the twelve-weeks Winter Dairy Course, beginning early in October. No entrance examination is required. However, anyone who attends must be at least 16 years of age, must have had an eighth-grade education, and must have had at least six months of practical experience in a creamery, cheese factory, or other dairy manufacturing plant. High-school graduates may be admitted without having had practical experience. A bulletin containing detailed information on the Winter Dairy Course, the Summer Dairy Course, the Swiss-Cheese Makers Course, and the Special Dairy Manufacturers Conference may be obtained by writing to the Chairman of the Department of Dairy Industry, College of Agriculture, Madison 6, Wisconsin.

SHORT SERVICE COURSES

In addition to the courses mentioned heretofore, the College of Agriculture sponsors a number of short service courses which vary from one day to two weeks in length. All of these courses have been held on the campus in the past but some of them are now given throughout the State on an extension basis. The courses are as follows:

Agricultural and Home Economics
 Teachers' Summer Conference
 Animal Breeders' School
 Canners' Short Course
 Cold Storage Locker Operators'
 Conference
 Cooperative Management School
 County Agents' and Home Demonstration
 Agents' Conference
 Farm and Home Week
 Farmers' Field Days
 Federal Land Bank Fieldmen's School

Four-H Club Week
 Garden Club Short Course
 Greens-keepers' Short Course
 State Judging Contests
 State Junior Conservation Camp
 Town-Country Leadership Summer
 School
 Wisconsin Fertilizer Conference
 Wisconsin Junior Livestock
 Exposition
 Wisconsin Rural Life Conference

Although it is not definitely established that all of the above mentioned courses will be offered again, it is likely that they will be given, though not necessarily on an annual basis. Persons interested in detailed information concerning any of the above courses should write to Assistant Dean, V. E. Kivlin, College of Agriculture, Madison 6, Wisconsin.

DEPARTMENTS OF INSTRUCTION

Abbreviations used in the announcement of courses:

Yr—Course continues through the year; I—given during the first semester; II—given during the second semester; I and II—repeated each semester; Cr—credits, i.e. hours of credit per semester; *—credits to be arranged.

In some instances a course may be offered in more than one department within the College of Agriculture and in departments of other colleges. In such cases the course is duplicated in the numerical listing of courses in those departments; likewise in some instances the name of the instructor is also duplicated in the faculty list following the departmental heading.

AGRICULTURAL BACTERIOLOGY

PROFESSORS BALDWIN, FRAZIER, *chairman*, FRED; ASSOCIATE PROFESSORS MCCOY, SARLES, WILSON; ASSISTANT PROFESSORS UMBREIT, MCCARTER; INSTRUCTORS BURRIS, JOHNSON.

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; 4 cr. Required of all agricultural students. Prerequisite: Chem. 1a. Mr. Umbreit, Mr. Sarles.

2. GENERAL SURVEY. II; 4 cr. For chemistry course students. Prerequisite: Chem. 1b. Mr. Wilson.

4. GENERAL SURVEY. II; 4 cr. The relation of microorganisms to foods, domestic sanitation, and hygiene. Required of professional majors in home economics. Prerequisite: Chem. 1b. Mr. Frazier, Miss McCarter.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing, Agr. Bact. 1, 2, or 4, and consent of instructor. Staff.

120. ADVANCED GENERAL MICROBIOLOGY. I, II; 3 cr. Study of morphological, cultural and physiological characteristics of important groups of microorganisms. Instruction on sterilization, media making, staining and microscopy. Prerequisite: Agr. Bact. 1, 2, or 4, or Med. Bact. 102. Miss McCoy, Mr. Sarles.

121. DAIRY BACTERIOLOGY. II; 3 cr. The bacteriology of milk and its products. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Mr. Frazier, Mr. Sarles.

123. SOIL BACTERIOLOGY. I; 3 cr. Study of soil microorganisms. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Mr. Umbreit, Mr. Fred.

125. FOOD BACTERIOLOGY. I; 3 cr. The microbiology of foods and of food fermentations. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Mr. Frazier.

126. PHYSIOLOGY OF BACTERIA. II; 3 cr. The chemistry and physics of bacterial processes. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Mr. Umbreit, Mr. Wilson, Mr. Baldwin.

127. INDUSTRIAL MICROBIOLOGY. II; 3 cr. (Complementary with Biochemistry 127.) Principal bacteria, yeasts, and molds of industrial importance. Methods of isolating, identifying, and handling stocks and starter cultures; conditions affecting their efficiency in industrial application. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Miss McCoy and staff.

130. IDENTIFICATION AND CLASSIFICATION OF BACTERIA. II; 2 or 4 cr. Lectures on taxonomy, nomenclature, problems of classification. Laboratory work on properties that aid in identification and classification of a selected group of microorganisms. Two lectures, 2 cr.; laboratory, 2 cr. Prerequisite: Agr. Bact. 120 or equivalent. Miss McCoy.

131. PROSEMINARY. Yr; 1 cr. For senior majors and students in early part of graduate study. First semester: History of bacteriology. Mr. Wilson, Mr. Sarles. Second semester: Study of journals and use of library. Miss McCoy.

180. SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. A detailed study of a definite problem in the field of agricultural bacteriology. Prerequisites: Graduate standing, six credits in bacteriology, and consent of instructor. Staff.

231. SEMINARY. Yr; 1 cr. Reviews of bacteriological subjects and reports on research work in the department. Mr. Frazier.

AGRICULTURAL ECONOMICS

PROFESSORS FROKER, HOBSON, *chairman*, McNALL, ROWLANDS, WEHRWEIN, WILCOX; ASSOCIATE PROFESSORS ANDERSON, BAKKEN, HALL, MORTENSON, PARSONS, SALTER, SCHAARS; ASSISTANT PROFESSORS EBLING, FOLLETT, HARDIN, MITCHELL; LECTURER RILEY.

Agricultural economics courses are intended to give students a knowledge of economic principles relating to agriculture. The courses deal with production, marketing, cooperation, credit, prices, foreign trade, agricultural relations, land policies, farm tenure, farm management, and agricultural policies.

Students may take agricultural economics: first, as a full major by those who decide to make it a main line of study preparatory to teaching, research, or other economic work; second, as a joint major with work in other departments; and third, as a full major by students interested in agricultural commerce. The agricultural commerce program of study should be arranged by the student in consultation with his adviser in the Department of Agricultural Economics.

Students are advised to take Economics 1a and 1b and Agricultural Economics 1 and 8 in the sophomore year.

1. PRINCIPLES OF AGRICULTURAL ECONOMICS. II; 3 cr. Required of all agricultural students. Prerequisite: Econ. 1a. Mr. Parsons.

8. FARM RECORDS AND ACCOUNTS. I; 2 cr. Includes principles and techniques of double entry bookkeeping; interpretation of farm financial and operating statements. Mr. McNall.

10. FARM ORGANIZATION AND MANAGEMENT. II; 3 cr. Methods and practices applied to farm business management. Prerequisite: Junior standing. Mr. Wilcox.

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

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.

106. CROP AND LIVESTOCK ESTIMATING. I; 3 cr. Methods of collecting agricultural statistics and their use in teaching, extension and research. Prerequisite: Agr. Econ. 1 or Econ. 1b. Mr. Ebling, Mr. Anderson.

117. OUTLINES OF LAND ECONOMICS. I; 3 cr. Economic principles underlying the utilization and conservation of land or natural resources. Prerequisite: Agr. Econ. 1 or Econ. 1b. Mr. Salter.

126. INTERNATIONAL TRADE IN AGRICULTURAL PRODUCTS. I; 3 cr. Theories of foreign trade; foreign exchange; history and analysis of agricultural exports and imports; governmental aids and restrictions to trade. Prerequisite: Economics 1a. Mr. Schaars.

127. COOPERATION. I, II; 3 cr. Analysis of marketing organizations, methods and theory underlying producer and consumer cooperative enterprises. Consideration of economic, legal and social aspects of cooperation. Prerequisite: A course in marketing, junior standing, or consent of instructor. Mr. Bakken.
128. MARKETING AGRICULTURAL PRODUCTS. I; 3 cr. Principles and practices of agricultural marketing; market prices and costs; case studies. Prerequisite: Econ. 1a. Mr. Schaars.
129. COOPERATIVE MANAGEMENT PROBLEMS. I; 2 cr. Consideration of the business structure of cooperative associations; problems involving organization, membership relations, financing, trade and sales practices, and administrative policies. Prerequisite: Agr. Econ. 127 or consent of instructor. Mr. Hobson, Mr. Froker.
152. FARMER MOVEMENTS. I; 3 cr. History of farmers' efforts to improve their status through organizations designed to control markets and influence legislation. Prerequisite: Econ. 1a or consent of instructor. Mr. Hobson.
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. Prerequisite: Agr. Econ. 1 or Econ. 1b. Mr. Hardin.
162. AGRICULTURAL POLICIES. II; 2 cr. An analysis of governmental aids to agriculture in the United States and abroad. Prerequisite: Senior standing. Mr. Hobson.
179. URBAN LAND ECONOMICS. II; 3 cr. Urbanization, location of industries and cities, urban land utilization, position of the city in our economy. Prerequisite: Agr. Econ. 117 or consent of instructor. Mr. Wehrwein.
180. SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.
200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Cooperation and marketing. Mr. Hobson, Mr. Bakken, Mr. Froker, Mr. Schaars. Farm surveys and financial accounts in relation to farm management, Mr. McNall, Mr. Wilcox. Organized farmer movements, Mr. Hobson. Taxation and farm credit, Mr. Parsons. Land Economics and land problems, Mr. Wehrwein, Mr. Salter. Crop and livestock estimating and agricultural data, Mr. Anderson. Mr. Ebling. Agricultural prices and statistics, Mr. Mortenson. International trade and agricultural policies, Mr. Hobson. Mr. Schaars.
221. LAND INCOME. II; 3 cr. Economics of land utilization, theories of rent, principles of land evaluation and taxation. Mr. Wehrwein.
226. SEMINARY: LAND PROBLEMS. Yr; 2 cr. Land tenure and utilization in the principal countries. Prerequisite: Agr. Econ. 117, 229, or concurrent registration. Mr. Wehrwein, Mr. Salter.
228. SEMINARY: THEORY OF MARKETS AND MARKETING. I; 2 cr. A study of the historical development of markets; of modern market institutions such as auctions, clearing houses, exchanges, and boards of trade. Offered 1944-45 and alternate years. Mr. Bakken.
229. SEMINARY: ADVANCED AGRICULTURAL ECONOMICS. II; 3 cr. The field of agricultural economics with respect to its origin and the main issues. Mr. Parsons.
255. SEMINARY: PRICE ANALYSIS. II; 3 cr. The application of statistical and other methods involved in analyzing agricultural prices and related problems. Prerequisite: Economics 130 or consent of instructor. Offered 1945-46 and alternate years. Mr. Mortenson.

AGRICULTURAL EDUCATION

PROFESSORS BEWICK, CLARK, JAMES, *chairman*, KIVLIN; INSTRUCTOR MORRISSEY.

Students in the College of Agriculture who wish to prepare for the teaching of agriculture in secondary schools must complete an academic minor in general science, biology,

or in community relationships, and elective courses in animal husbandry, dairy husbandry, poultry husbandry, dairy industry, agronomy, horticulture, soils, agricultural engineering, and agricultural economics as a background of agriculture and also the 18 credits in education required for the University Teachers' Certificate as outlined below.

Some students wish a major in a department other than agricultural education and also to be prepared as teachers of vocational agriculture. Students desiring this combination should see the chairman of the Department of Agricultural Education at the beginning of the sophomore year. Farm experience beyond summers is necessary; the farm-reared students are desired. A scholarship record of 1.3 grade-points per credit is necessary to begin teacher training preparation.

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; and (c) complete the following courses:

	Credits
Educ. 73—The child:—his nature and his needs	3
Educ. 75—The nature and direction of learning	5
Agr. Educ. 1—Rural education	2
Agr. Educ. 50—Teaching of agriculture	5
Agr. Educ. 128—Program building in vocational agriculture	3

Students beginning work for a certificate may arrange their courses most satisfactorily by starting the requirements during the second semester of the sophomore year. Education 75 should definitely be completed before the beginning of the senior year. Credits in Education 75 may be counted toward graduation only by students who complete the requirements for the University Teachers' Certificate. Seniors spend a week each semester in a high-school vocational agricultural department.

MAJOR. Not more than 5 credits in education taken in the School of Education may count toward the major in agricultural education. These 5 credits shall in no way be counted as a portion of the minimum number of 50 credits required in the strictly agricultural subjects. Course 16, 2 credits, given jointly by the departments of Agronomy and Horticulture, may be counted as a portion of the 5 credits of the major requirement outside the Department of Agricultural Education.

1. **RURAL EDUCATION. II; 2 cr.** Origin and development of vocational education for rural communities. Problems, principles, and practices of rural education. Prerequisite: Sophomore standing. Mr. James.

25. **RURAL LIFE.** (See Rural Sociology 25.) I; 3 cr. May be included as part of a major in agricultural education. Prerequisite: Sophomore standing. Mr. Kolb.

50. **TEACHING OF AGRICULTURE. I, II; 1-5 cr.** Directed teaching based upon participation in agricultural activities of the Wisconsin High school, and vocational departments of agriculture. Prerequisites: Educ. 75 and senior standing. Mr. Kivlin, Mr. Morrissey.

100. **THESIS. Yr; 2 cr.** Prerequisites: Senior standing and consent of instructor. Staff.

103. **SEMINARY. I, II; *cr.** Problems in rural education for extension workers, teachers, and rural leaders. Mr. James.

111. **EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS. I; 3 cr.** Relationships and legal status of the various services for agriculture and home economics. Methods of organization and instruction used with adults and boys and girls. Mr. Clark and staff.

128. **PROGRAM BUILDING IN VOCATIONAL AGRICULTURE. I, II; 3 cr.** The program of work, directed practice, part-time and evening school, adapted to teaching agriculture in secondary schools. Prerequisites: Major in agricultural education and senior standing. Mr. James.

180. SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. Problems of vocational, extension, or demonstration work. Prerequisites: Graduate standing and consent of instructor. Mr. James, Mr. Clark.

AGRICULTURAL ENGINEERING

PROFESSORS DUFFEE, *chairman*, ZEASMAN; ASSOCIATE PROFESSORS TRENK, WITZEL; ASSISTANT PROFESSORS BRUHN, LA ROCK, SWANSON; INSTRUCTOR CARTER.

A five-year course combining agriculture with either civil, electrical, or mechanical engineering is organized for the training of agricultural engineers. The complete curriculum for civil, electrical, or mechanical engineering as combined with agriculture may be obtained from the departmental office. Upon completion of four years of required work, including 45 credits in agriculture, the B.S. (Agriculture) degree is granted, with a B.S. degree in civil, electrical, or mechanical engineering after the fifth year, if all requirements have been met. Freshman majors in professional agricultural engineering should consult the chairman of the department before or during the first semester, to arrange the proper sequence of courses.

Students desiring to enter sales, advertising, or service work with industries selling agricultural equipment are advised to follow the agricultural equipment industry major listed on page 43. Students inclined toward engineering and desiring to return to their farms are advised to major in non-technical agricultural engineering. This major may be combined with other key subjects in agriculture, to provide thorough training for farm operation and management.

1. SURVEYS AND STRUCTURES. I, II; 4 cr. Agricultural surveying; drainage; farm building economics, costs, requirements and planning. Mr. Witzel.

5. POWER AND MACHINERY. I, II; 5 cr. Construction, operation, adjustment and management of farm field machinery, gasoline engines, electric motors and water systems. Mr. Duffee and staff.

9. FARM MECHANICS. II; 3 cr. A course designed for students planning to teach vocational agriculture in high schools.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.

101. DRAINAGE AND IRRIGATION ENGINEERING. I; 2 cr. Field surveys and designs for farm and community drainage systems. Design of irrigation systems. Prerequisite: Agr. Engr. 1 or Civil Engr. 11 and 12. Offered 1944-45 and alternate years. Mr. Witzel, Mr. Zeasman.

105. FARM TRACTORS AND TRACTOR MACHINERY. II; 4 cr. Construction, operation, care and adjustment of tractors and tractor machinery. Prerequisite: Agr. Engr. 5. Mr. Bruhn.

106. SOIL EROSION: CAUSES AND CONTROL. I; 4 cr. (Same as Soils 106.) Causes and control of erosion by means of soil management and engineering practices. Only two credits of this course may be applied toward a major in agricultural engineering. Prerequisites: Soils 1 and Agr. Engr. 1 or consent of instructor. Mr. Zeasman, Mr. Muckenhirn.

111. FARM STRUCTURES. I; 4 cr. Prerequisites: Agr. Engr. 1 or Drawing 1, and Civil Engr. 117 or 118. Offered 1945-46 and alternate years. Mr. Witzel.

121. SEMINARY. I; 1 cr. Review of current literature and studies of agricultural engineering problems. Prerequisite: Senior standing. Mr. Duffee and staff.

180. SPECIAL PROBLEMS. I, II; *cr. Open only to students in professional agricultural engineering. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Staff.

AGRICULTURAL JOURNALISM

PROFESSORS HOPKINS, *chairman*, SUMNER; ASSISTANT PROFESSORS BLISS, HOVELAND, LANGDON, RASMUSSEN; INSTRUCTORS HAAG, HAZARD, KEARL.

There is an increasing demand for graduates in agriculture and in home economics who have had an adequate training in technical journalism. To render the greatest service most college graduates are making an increasing use of the printed page. The ability to write simply and understandingly is invaluable in many fields. Journalism, advertising and radio are playing an increasing part in the work of many university graduates.

For students returning to the farm, Agricultural Journalism 1 and 3 are suggested. For prospective agricultural teachers and extension workers courses 1, 3, and 103 are recommended. Prospective teachers and workers in home economics extension are advised to take courses 8 and 103. For research workers Agricultural Journalism 1 or 8 and 115 are advised.

Majors in the department will be expected to take courses 1 or 8, 103, 111 or 112, and 115. Courses in the Department of Journalism in the College of Letters and Science should be taken in addition, and not to exceed 5 credits from the following may count toward a major: Journalism 2 and 3.

1. AGRICULTURAL NEWS WRITING. I, II; 3 cr. Prerequisite: Sophomore standing or consent of instructor. Mr. Sumner and staff.

2. PRACTICE IN EDITING. I, II; 1 cr. Prerequisite: A semester's work on the *Country Magazine* or consent of instructor. Mr. Sumner.

3. AGRICULTURAL ADVERTISING. I, II; 3 cr. Prerequisite: Sophomore standing or consent of instructor. Mr. Sumner.

8. HOME ECONOMICS NEWS WRITING. I; 3 cr. Prerequisite: Sophomore standing or consent of instructor. Mr. Sumner.

10. TECHNICAL WRITING. II; 2 cr. Direction and practices in reporting scientific work. Prerequisite: Senior standing. Mr. Hoveland.

18. FARM AND HOME RADIO WRITING. I; 2 cr. Includes a general survey of radio; continuity writing; script editing; news gathering and preparation; program planning and auditing; radio style. Prerequisite: Junior standing, Speech 110, or consent of instructor. Staff.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.

103. PUBLICITY MEDIA AND METHODS. II; 2 cr. Prerequisite: Agricultural Journ. 1 or 8. Mr. Hopkins.

111. WRITING AGRICULTURAL FEATURES. I; 2-3 cr. May be taken for 3 credits by majors in agricultural journalism. Prerequisite: Student in agriculture or consent of instructor. Mr. Sumner, Mr. Hoveland.

112. WRITING HOME ECONOMICS FEATURES. II; 2-3 cr. May be taken for 3 credits by majors in home economics journalism. Prerequisite: Student in home economics or consent of instructor. Mr. Sumner.

115. WRITING AND EDITING BULLETINS. I; 2 cr. Prerequisite: Senior standing. Miss Langdon.

180. SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Mr. Hopkins, Mr. Sumner.

208. SEMINARY. Yr; 2 cr. Reader interest. Mr. Sumner.

212. SEMINARY. Yr; 2 cr. History of magazines. Offered 1944-45 and alternate years. Mr. Sumner.

AGRICULTURAL LIBRARY

ASSOCIATE PROFESSOR HEAN, *librarian*.

1. LIBRARY PRACTICE. I; 2 cr. Library classification and arrangement, bulletin filing, use of card catalogues, periodical indexes, abstract journals, public documents, standard reference works, and the compiling of bibliographies. Mr. Hean.

AGRONOMY

PROFESSORS BRIGGS, DELWICHE, GRABER, *chairman*, LEITH, NEAL, WRIGHT; ASSOCIATE PROFESSORS AHLGREN, ALBERT, H.L. SHANDS, D.C. SMITH; ASSISTANT PROFESSORS BURCALOW, HOLDEN, R.G. SHANDS, W.K. SMITH, STROMMEN, TORRIE; INSTRUCTORS ANDREW, SCHWENDIMAN, TURNER.

Not to exceed five credits from the following courses may be counted as a portion of the major requirements in agronomy: Soils 26, Soils 106, Soils 127, Plant Pathology 101, Botany 117, Botany 129, and Genetics 104.

1. PRINCIPLES AND PRACTICES IN CROP PRODUCTION. I, II; 3 cr. A survey of plant science with emphasis on the applications to agronomic practice. Required of all agricultural students. Mr. Ahlgren, Mr. Schwendiman.

16. CROP IDENTIFICATION AND STANDARDS. I; 2 cr. (Same as Horticulture 16.) A laboratory study of the classification, identification and standards of excellence of field, orchard, and garden crops. Only one credit of this course may be counted toward a major in agronomy. Prerequisite: Junior standing. Mr. Holden, Mr. J. G. Moore.

100. THESIS. Yr; 2 cr. Subject should be chosen early. Prerequisites: Senior standing and consent of instructor. Staff.

102. PASTURES AND PASTURE PROBLEMS. I; 2 cr. The establishment, maintenance, and improvement of pastures. Prerequisites: Agron. 1 and preferably some courses in soils and botany. Mr. Ahlgren.

104. GRAIN CROPS. I; 3 cr. Taxonomic aspects, origin and distribution, cultural and commercial relations. Prerequisite: Agron. 1 or consent of instructor. Mr. Leith. Mr. H. L. Shands.

106. FORAGE PROBLEMS. II; 3 cr. Problems related to the culture of alfalfa, clovers, grasses, and other forages, with emphasis on growth, food reserves, morphology, and survival. Prerequisite: Junior standing. Mr. Graber.

120. SEED AND WEED CONTROL. I; 3 cr. Classification and identification of weeds and their seeds or fruits; control and basic principles involved. Prerequisite: Agron. 1. Mr. Schwendiman.

130. THE IMPROVEMENT OF AGRONOMIC PLANTS. I; 2 or 3 cr. Principles, objectives and techniques in the breeding and distribution of new varieties. Prerequisite: Genetics 1. Mr. D. C. Smith and staff.

131. SEMINARY. Yr; 1 cr. A review of current literature and studies of agronomic problems. Prerequisites: Ten credits in agronomy and botany or both. Staff.

136. BIOMETRY. I; 3 cr. Introduction to the logic and use of statistics in the planning, analysis and interpretation of biological data. Prerequisites: Math. 1 or equivalent, and junior standing. Mr. Torrie.

150. ADVANCED PLANT BREEDING. II; 3 cr. Problems and methods in the improvement of cereal, legume, grass, fiber, sugar and other agronomic species. Pathological and physiological relationships will be considered. Prerequisites: Genetics 104 and Agron. 130. Mr. D. C. Smith and staff.

180. SPECIAL PROBLEMS. I, II; *cr. Offered at Madison and the branch experiment stations. Prerequisites: Senior standing and consent of instructor. Staff.

190. EXPERIMENTAL DESIGN. II; 3 cr. The application of statistical methods to laboratory and field experiments. Prerequisite: A course in statistics or consent of instructor. Mr. Torrie.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Staff.

ANIMAL HUSBANDRY

PROFESSORS BOHSTEDT, *chairman*, FULLER, LACEY; ASSISTANT PROFESSORS FARGO, ROSS; INSTRUCTORS BRAY, HAMILTON, WINCHESTER; ASSISTANT GRUMMER.

The courses offered in this department, and as supplemented by courses in related departments, teach the principles of livestock production. They prepare students for teaching, investigation, and extension; for positions in industries such as meat packing and feed manufacturing; as well as for livestock farming.

Not to exceed five credits from the following courses may be counted as a portion of the major requirement in animal husbandry: Biochemistry 110, Genetics 103, Veterinary Science 28 and 29.

1. LIVESTOCK PRODUCTION. I, II; 3 cr. (Same as Dairy Husbandry 1.) Present status of livestock development; judging, market classification and practical problems; lectures, and laboratory exercises. Required of all agricultural students. Mr. Fuller, Mr. Winchester, and dairy husbandry staff.

2. HISTORY OF BREEDS. II; 2 cr. Origin and development of breeds of beef cattle, horses, sheep, and swine. Biography and methods of foundation breeders, pedigrees, breed character study, distribution, and utility. Prerequisite: An. or Dy. Husb. 1 or consent of instructor. Mr. Fuller.

3. LIVESTOCK SELECTION. II; 1 or 2 cr. Standards of excellence for market, showyard, and breeding animals. May be elected for only one credit by those having earned two credits in Dy. Husb. 5. Prerequisites: Sophomore standing and An. or Dy. Husb. 1. Mr. Winchester.

5. MEAT PRODUCTION AND CARCASS VALUE. I, II; 2 cr. A study of meat characteristics; the effect of type, feed, and condition on the quality, yield, and value of carcasses of beef, mutton, and pork. Prerequisite: An. or Dy. Husb. 1. Mr. Grummer.

50. MEAT SELECTION AND USE. I, II; 1 cr. (War Emergency course.) Meat nutrition; meat identification, grading, and inspection; prices and uses of retail cuts. Use of freezer lockers for meat storage. Available to women only. Mr. Grummer.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.

105. MEAT SELECTION AND USE. II; 2 cr. The composition and characteristics of meat from different animals; identification, preservation, comparative values and utilization of various grades and cuts. Prerequisites: A course in bacteriology and in biochemistry. Mr. Grummer.

126. LIVESTOCK FEEDING. I, II; 4 cr. (Same as Dairy Husbandry 126.) A study of the principles of feeding and the composition of feeds; practice in formulating rations for the various classes of livestock. May not be elected by those having elected Dy. Husb. 126. Mr. Bohstedt.

130. SWINE AND SHEEP PRODUCTION. II; 3 cr. A study of systems of production, management practices, and methods of marketing. Prerequisite: An. or Dy. Husb. 1. Mr. Grummer, Mr. Winchester.

131. HORSE AND BEEF CATTLE PRODUCTION. I; 3 cr. Development and status of the horse and beef cattle industries; production and marketing of purebred and commercial animals. Prerequisite: An. or Dy. Husb. 1. Mr. Fuller.

134. LIVESTOCK BREEDING. II; 3 cr. (Same as Dairy Husbandry 134.) Scientific methods of breeding farm livestock; survey of known inheritance in farm animals; control of characters of economic importance; progeny tests and herd analysis. May not be elected for credit by those having elected Dy. Husb. 134. Prerequisite: An. or Dy. Husb. 1, Genetics 1, or consent of instructor. Mr. Heizer.

135. SEMINARY. I, II; 1 cr. (Same as Dairy Husbandry 135.) Studies and discussions of research work in animal husbandry and related fields; reports on articles of interest. Prerequisite: Junior standing. Mr. Bohstedt.

180. SPECIAL PROBLEMS. I, II; *cr. Prerequisite: Senior standing. Staff.

200. RESEARCH. Yr; *cr. Study of a specific problem in animal husbandry. Prerequisites: Graduate standing and consent of instructor. Staff.

BIOCHEMISTRY

PROFESSORS ELVEHJEM, *chairman*, HART, LINK, PETERSON, PHILLIPS, STEENBOCK; ASSOCIATE PROFESSORS BAUMANN, JOHNSON, STRONG; ASSISTANT PROFESSOR BURRIS.

The courses offered in this department are intended to give a broad view of biological 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 110 and 120 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.

1. ELEMENTARY BIOCHEMISTRY. II; 2 or 4 cr. Introduction to the chemistry of living matter. Laboratory work includes chemical analysis of agricultural materials. Prerequisite: Chem. 1b. Mr. Elvehjem.

3. FOOD BIOCHEMISTRY. I; 4 cr. Lectures and laboratory work on the chemistry and metabolism of the essential food constituents: carbohydrates, fats, and proteins. Required of all students in home economics. Prerequisite: Chem. 1b. Mr. Strong.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.

110. PRINCIPLES OF BIOCHEMISTRY. I; 3 or 5 cr. The biochemistry of lipids, carbohydrates, proteins, inorganic elements, water, enzymes, and other constituents of the cell. Three lectures, 3 cr.; two laboratory periods, 2 cr. Prerequisites: Chem. 12, 120 and 121. Mr. Elvehjem, Mr. Hart, Mr. Johnson, Mr. Link, Mr. Peterson, Mr. Steenbock.

120. PLANT BIOCHEMISTRY. II; 2-5 cr. The mechanism of chemical processes in the growth of plants, including the effect of environmental factors. Selected methods for the determination of plant constituents. Prerequisites: Chem. 1b and 120. Mr. Burris.

121. DAIRY CHEMISTRY. I; 2 or 5 cr. The chemistry of milk and its products, including the chemistry of fermentation and detection of adulterants. Prerequisites: Chem. 12, 120 and 121. Mr. Hart.

125. ANIMAL METABOLISM AND VITAMINS. II; 3 or 4 cr. Caloric relations; the chemistry of urine, blood, bone, and other tissues and vitamins, with feeding experiments on animals. Two lectures and two laboratory periods. Prerequisite: Biochem. 110 or consent of instructor. Mr. Baumann.

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 and swine. Prerequisite: Biochem. 110 or 121 or consent of instructor. Mr. Hart.

127. FERMENTATION BIOCHEMISTRY. II; 2-4 cr. Lectures on the chemical composition of microorganisms and the mechanism of fermentation processes; laboratory work on products of fermentation. Prerequisites: Biochem. 110 for lectures, and Agr. Bact. 1 for laboratory, or consent of instructor. Mr. Peterson. Mr. Johnson.

129. ENZYMES. I; 2 cr. A course of lectures and conferences dealing with the chemistry and mechanism of the action of recognized enzymes and the importance of their action in living tissues. Prerequisite: Biochem. 110. Mr. Elvehjem. Mr. Johnson.

130. ADVANCED BIOCHEMICAL PREPARATIONS. I; 2-3 cr. Designed to give experience in the preparation and isolation of natural products from plant or animal sources or through synthesis. Prerequisites: Biochem. 110, Chem. 120 and 123, and major in biochemistry. Mr. Link.

133. SEMINARY (JUNIOR). Yr. 1 cr. First semester: Mr. Link, Mr. Baumann. Second semester: Mr. Phillips, Mr. Strong.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Carbohydrate and plant chemistry, Mr. Link. Plant nutrition and plant metabolism, Mr. Burris. Chemistry of microorganisms, Mr. Johnson, Mr. Peterson, Mr. Strong. Animal chemistry and animal nutrition, Mr. Baumann, Mr. Elvehjem, Mr. Hart, Mr. Phillips, Mr. Steenbock. Dairy chemistry, Mr. Hart.

233. SEMINARY (SENIOR). Yr; 1 cr. Original articles of importance are studied in detail to broaden the understanding of biochemical problems and to stimulate further research. Staff.

DAIRY HUSBANDRY

PROFESSOR HEIZER, *chairman*; ASSOCIATE PROFESSOR RUPEL; ASSISTANT PROFESSORS COLLENTINE, CRAMER, HARRIS, VERGERONT, WERNER; INSTRUCTORS BARRETT, LUNDQUIST.

Instruction in dairy husbandry is designed to serve the needs of those looking forward to a given field of activity, such as (1) dairy farm operation and herd management; (2) investigation, teaching or extension; or (3) work in industries allied to agriculture.

The dairy farm operator or herdsman will be especially interested in training in all phases of breeding, feeding, management, and selection of dairy cattle. Anyone planning a career in research, teaching, or extension may want to specialize in some one phase of work after getting a fundamental background in dairy husbandry. Those interested in commercial work may include such courses in dairy husbandry as will serve them best in the field they have in view.

1. LIVESTOCK PRODUCTION. I, II; 3 cr. (Same as Animal Husbandry 1.) Present status and history of livestock development, judging, market classification; practical problems, lectures, and laboratory exercises. Required of all agricultural students. Mr. Barrett, Mr. Lundquist, and animal husbandry staff.

4. ELEMENTS OF DAIRY HUSBANDRY. I; 2 cr. Introduction to the field of dairy production; a survey course. Required of majors in dairy husbandry. Prerequisite: An. or Dy. Husb. 1. Mr. Barrett.

5. DAIRY CATTLE SELECTION. II; 1-2 cr. Modern standards of excellence in selecting dairy cattle. May be elected for only one credit by those having earned two credits in An. Husb. 3. Prerequisite: An. or Dy. Husb. 1. Mr. Rupel.

6. DEVELOPMENT OF DAIRY CATTLE BREEDS AND FAMILIES. I; 3 cr. Dairy breeds in their native lands and America. Factors which have contributed to the success or failure of leading breeding establishments. Pedigree studies of important families. Prerequisite: An. or Dy. Husb. 1. Mr. Heizer, Mr. Barrett.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.

126. LIVESTOCK FEEDING. I; 4 cr. (Same as Animal Husbandry 126.) A study of the principles of feeding and the composition of feeds; practice in formulating rations for the various classes of livestock. May not be elected for credit by those having elected An. Husb. 126. Mr. Bohstedt.

133. DAIRY CATTLE AND MILK PRODUCTION. II; 3 cr. Dairy herd management, care and replacement. An inspection tour costing two to three dollars is included. Prerequisites: An. or Dy. Husb. 1 and preferably Dy. Husb. 126. Mr. Rupel.

134. LIVESTOCK BREEDING. II; 3 cr. (Same as Animal Husbandry 134.) Scientific methods of breeding farm livestock; survey of known inheritance in farm animals; control of characters of economic importance; progeny tests and herd analysis. May not be elected for credit by those having elected An. Husb. 134. Prerequisite: An. or Dy. Husb. 1. Genetics 1, or consent of instructor. Mr. Heizer.

135. SEMINARY. I, II; 1 cr. (Same as Animal Husbandry 135.) Studies and discussions of research work in dairy husbandry and related fields; reports on articles of interest. Prerequisite: Junior standing. Mr. Bohstedt.

180. SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. Study of a specific problem in dairy husbandry. Prerequisites: Graduate standing and consent of instructor. Staff.

DAIRY INDUSTRY

PROFESSORS JACKSON, *chairman*, PRICE, SOMMER; ASSOCIATE PROFESSORS THOMSEN, WALLENFELDT, WECKEL.

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

Positions available to dairy majors are not limited to the farm, the factory, or the laboratory. Some graduates are employed in such activities as the design and manufacture of dairy equipment, the selling of dairy supplies and machinery, and the sales promotion of dairy products. Students desiring to major in the department and who do not wish to become research workers or dairy technologists may take work in engineering or commerce. Those who desire to become dairy engineers should work out their program with staff members of the department.

1. INTRODUCTION TO DAIRYING. II; 3 cr. General survey to show the relationship of dairy manufacturing to general farm problems. Emphasis on quality control, grading, and elementary analysis of dairy products. Mr. Jackson.

42. STANDARDS OF QUALITY FOR PRODUCTION AND DISTRIBUTION. II; 3 cr. Legal standards for dairy products; civil and military regulations for milk production, plant operation, inspection and grading. Prerequisite: Sophomore standing. Mr. Thomsen, Mr. Weckel.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.

103. CREAMERY OPERATION AND MANAGEMENT. I; 3 cr. The manufacture of creamery butter and other products often made in connection with creamery operation. Emphasis is placed on quality and on management. Prerequisite: Dy. Ind. 1. Mr. Thomsen.

104. **CHEESE.** II; 4 cr. Commercial practices and principles of curd-making and cheese-ripening. Prerequisite: Dy. Ind. 1. Mr. Price.
105. **MARKET MILK.** I; 3 cr. Production and commercial handling, processing, and distribution of market milk and related products. Quality, public health regulations, equipment operation, laboratory procedures, problems. Prerequisite: Dy. Ind. 1. Mr. Weckel.
106. **ICE CREAM AND CONDENSED MILK PRODUCTS.** II; 3 cr. The theory and practice of manufacturing ice cream, milk powder, malted milk, condensed milk, and evaporated milk. Quality factors and defects in these products. Prerequisite: Dy. Ind. 1. Mr. Sommer.
108. **DAIRY MECHANICS.** II; 3 cr. Dairy plant construction, heating, ventilation, power plant operation, sewage disposal, refrigeration, installation, testing, and operation of dairy machinery. Includes an optional two-day field trip. Mr. Thomsen.
123. **SEMINARY.** Yr; 1 cr. Prerequisite: Senior standing. Mr. Sommer and staff.
124. **PHYSICAL CHEMISTRY OF DAIRY PRODUCTS.** II; 3 cr. Lectures and laboratory exercises on hydrogen ion concentration, oxidation-reduction potentials, surface tension, absorption, viscosity, plasticity; isoelectric point of proteins, colloidal properties of milk constituents. Mr. Sommer.
180. **SPECIAL PROBLEMS.** I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.
200. **RESEARCH.** Yr; *cr. Experimental study of problems in dairy manufacturing. Prerequisites: Graduate standing and consent of instructor. Staff.

ECONOMIC ENTOMOLOGY

PROFESSORS FLUKE, *chairman*, WILSON; ASSOCIATE PROFESSORS ALLEN, FARRAR; ASSISTANT PROFESSORS LILLY, SEARLS; INSTRUCTOR ROBERTS.

Students majoring in economic entomology⁴ have an opportunity to enter state and government service. Those preparing for commercial positions should elect additional courses in physics and chemistry.

For graduate work in entomology and beekeeping, write to the chairman of the Department of Economic Entomology for additional information.

1. **ELEMENTARY ENTOMOLOGY.** (Farm Insects.) II; 3 cr. A general collection of insects is required of each student. Mr. Fluke.
2. **INSECT MORPHOLOGY AND TAXONOMY.** I; 3 cr. Prerequisite: Econ. Ent. 1 or consent of instructor. Mr. Fluke.
10. **ELEMENTARY BEEKEEPING.** II; 3 cr. Elementary principles of beekeeping. Mr. Farrar.
100. **THESIS.** Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.
103. **ORCHARD INSECTS.** I; 2 cr. A study of the insect pests of the orchard and bush fruits. Prerequisite: Econ. Ent. 1 or 2, or a course in zoology. Offered 1945-46 and alternate years. Mr. Fluke.
105. **FIELD CROP AND GARDEN INSECTS.** II; 2 cr. A study of the insect pests of field, garden, and truck crops. Prerequisite: Econ. Ent. 1 or 2, or a course in zoology. Offered 1945-46 and alternate years. Mr. Searls.
107. **PRINCIPLES OF INSECT CONTROL.** I; 3 cr. The preparation, uses and toxicities of insecticides and their applications. Prerequisites: Chem. 1b and consent of instructor. Offered 1944-45 and alternate years. Mr. Allen.
110. **ENTOMOLOGY (ANATOMY AND PHYSIOLOGY OF INSECTS.)** I; 3 cr. Prerequisite: Elementary entomology. Mr. Lilly.
123. **TAXONOMY OF INSECT LARVAE.** I; 3 cr. The identification and morphology of immature insects. Prerequisite: Econ. Ent. 2 or consent of instructor. Offered 1944-45 and alternate years. Mr. Searls.

125. INSECTS IN RELATION TO PLANT DISEASE. I; 2 cr. The principal insect vectors and their habits; modes of insect transmission and dissemination of plant diseases. Prerequisites: A course in entomology and plant pathology or consent of instructor. Offered 1945-46 and alternate years. Mr. Searls.

130. SEMINARY. I, II; 1 cr. Prerequisite: Senior standing. Mr. Wilson.

140. INSECT ECOLOGY. II; 3 cr. Insects in their relation to their environment. Prerequisite: Econ. Ent. 1 or 2, or a course in zoology. Offered 1944-45 and alternate years. Mr. Lilly.

180 SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. Study of a specific problem in economic entomology. Prerequisites: Graduate standing and consent of instructor. Staff.

FOREST PRODUCTS

Students who want to obtain a degree in forestry may take the pre-forestry course explained on pages 13-14, and then complete the work at another institution where a degree in forestry is offered.

The courses described below are offered by the United States Forest Products laboratory in cooperation with the University of Wisconsin. The courses, which are offered in logical sequence, consist of subject matter with which anyone, who intends to go on into the fields of wood utilization or its related branches, should be thoroughly familiar.

1. GENERAL FORESTRY. I; 2 cr. An outdoor study of trees. Natural forest conditions and the development of forest policy in the United States and elsewhere. Mr. Tiemann.

101. PROPERTIES OF WOOD. I; 2 cr. Structure of wood as related to its properties. Physical, mechanical, and chemical properties; pulping and gluing characteristics; relation of defects and fungi to wood properties. Prerequisite: Forest Products 1. Offered 1945-46 and alternate years. Mr. Koehler and staff.

102. WOOD TECHNOLOGY. II; 2 cr. Wood as a biological product, its anatomy and variation with species; properties and uses; moisture relations and kiln drying. Prerequisite: Elementary chemistry and physics or consent of instructor. Mr. Tiemann.

119. FUNGUS DETERIORATION OF FOREST PRODUCTS. I; 2 cr. (Same as Plant Pathology 119.) A survey of the cause and prevention of stains and decay in forest products, and control measures. Prerequisites: Plant Path. 101 and 104. Offered 1944-45 and alternate years. Miss Richards.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Staff.

GENETICS

PROFESSORS BRINK, *chairman*, COLE, IRWIN, NEAL, RIEMAN; ASSOCIATE PROFESSORS CASIDA, COOPER; ASSISTANT PROFESSORS CHAPMAN, SMITH.

The following courses are designed for those seeking a broad knowledge of heredity in relation to animal and plant breeding, and for students desiring to prepare themselves for instructional work and research in genetics.

1. PRINCIPLES OF BREEDING. I; 4 cr. Basic principles of heredity in relation to the improvement of plants and animals. Prerequisite: A college course in botany or zoology. Mr. Chapman and staff.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.

103. REPRODUCTION OF FARM ANIMALS. II; 2 cr. The process of reproduction and the internal and external factors affecting it. Prerequisite: Genetics 1 or Physiol. 3 or Vet. Sci. 1. Mr. Casida.

104. PLANT GENETICS. II; 3 cr. Mechanism of Mendelian heredity; genic and chromosomal variation; principles of plant improvement. Prerequisite: Genetics 1. Mr. Brink.

105. ANIMAL GENETICS. II; 3 cr. Principles underlying selection, inbreeding, pedigree evaluation, progeny testing; measuring inbreeding, relationship. Prerequisite: Genetics 1. Mr. Chapman and staff.

180. SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Animal genetics, Mr. Cole, Mr. Irwin, Mr. Chapman. Plant genetics, Mr. Brink, Mr. Neal Mr. Rieman, Mr. Cooper, Mr. Smith. Physiology of reproduction, Mr. Casida.

210. RECENT ADVANCES IN GENETICS. II; 2 cr. Offered 1945-46 and alternate years. Prerequisite: Consent of instructor. Mr. Irwin and staff.

211. RECENT ADVANCES IN GENETICS. II; 2 cr. Offered 1944-45 and alternate years. Prerequisite: Consent of instructor. Mr. Irwin and staff.

220. SEMINARY. Yr; 1 cr. Prerequisite: Consent of instructor. Mr. Cole and staff.

(For courses in probability and statistics see Math. 118, 135, 137, and Agron. 136.)

HORTICULTURE

PROFESSORS JOHNSON, MILWARD, MOORE, *chairman*, RIEMAN, ROBERTS; ASSOCIATE PROFESSOR LONGENECKER; ASSISTANT PROFESSORS COMBS, KUEHNER, OGDEN; INSTRUCTORS CHAMBERLAIN, ELFNER, STRUCKMEYER.

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, 3, 5, 6, 7, and 12 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 horticulture may count a maximum of five credits toward the major requirement by electing Economic Entomology 103 or 105 and Plant Pathology 7. Students majoring in landscape gardening are not required to count as credits in their major the following courses in the Department of Horticulture: Horticulture 1, 3, 5, and 16. Landscape majors may substitute Art Education 50 for Animal Husbandry 1 and Civil Engineering 117 or 118 for Mathematics in the freshman year. With the consent of the major adviser Agricultural Economics 117 may be substituted for Agricultural Economics 1. The attention of majors is called to courses in city planning offered by the College of Engineering.

1. PRINCIPLES OF FRUIT GROWING. I; 3 cr. Fruit growing and its application to our common tree fruits. Mr. Moore.

3. VEGETABLE GARDENING. II; 3 cr. The growing of vegetables out of doors. Practical work in the gardens. Mr. Moore.

5. SMALL FRUIT CULTURE. I; 2 cr. Culture of cane, bush and other small fruits. Offered 1944-45 and alternate years. Mr. Moore.

6. PRINCIPLES OF LANDSCAPE DESIGN. I—Annually; II—Offered 1944-45 and alternate years; 3 cr. First semester—designed primarily for students in landscape gardening. Second semester—designed for students not majoring in landscape gardening. An inspection trip is required. Mr. Longenecker.

7. PLANT PROPAGATION. II; 2 cr. Principles and practices involved in propagating horticultural plants. Mr. Moore.

8. HOME HORTICULTURE. II; 3 cr. Plants and flowers for home beautification; production of vegetables and small fruits for home use. Designed primarily for women. Offered 1945-46 and alternate years. Mr. Moore.

12. ELEMENTARY HOME GROUNDS DESIGN. II; 3 cr. A continuation of Hort. 6. An inspection trip is required. Prerequisite: Hort. 6 or consent of instructor. Mr. Longenecker.

13. LAWNS. I; 2 cr. A study of ground forms, terracing, grading, seeding, estimating. Prerequisite: Consent of instructor. Offered 1944-45 and alternate years. Mr. Longenecker.

14. LANDSCAPE CONSTRUCTION PROBLEMS. Yr; 3 cr. Prerequisite: Hort. 6. Offered 1945-46 and alternate years. Mr. Longenecker.

16. CROP IDENTIFICATION AND STANDARDS. I; 2 cr. (Same as Agronomy 16.) A laboratory study of the classification, identification and standards of excellence of field, orchard and garden crops. Only one credit of this course may be counted toward a major in horticulture. Prerequisite: Junior standing. Mr. Moore, Mr. Holden.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.

101. ADVANCED HOME GROUNDS DESIGN. I; 3 cr. Design of estate, country home grounds, and related problems. Prerequisites: Hort. 6 and 12. Offered 1945-46 and alternate years. Mr. Longenecker.

102. PUBLIC GROUNDS. II; 3 cr. Landscape problems in connection with public buildings; parks and cemetery design; roadside planting. Prerequisites: Hort. 6 and 12. Offered 1945-46 and alternate years. Mr. Longenecker.

104. LANDSCAPE PLANTS. Yr; 2 cr. First semester: A study of plant forms, color and texture in landscape design. Second semester: Advanced study of annuals and herbaceous perennials. Prerequisite: Hort. 6. Offered 1944-45 and alternate years. Mr. Longenecker.

110. SEMINARY. Yr; 1 cr. Prerequisite: Senior standing. Mr. Longenecker, Mr. Roberts.

122. ADVANCED POMOLOGY. Yr; 2 or 4 cr. Recent theory and practice regarding problems of commercial orcharding. First semester: Problems relating to fruit. Second semester: Problems of orchard practice. Prerequisite: Hort. 1 or consent of instructor. Mr. Roberts.

180. SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Staff.

PLANT PATHOLOGY

PROFESSORS DICKSON, KEITT, *chairman*, RIEMAN, RIKER, VAUGHAN, WALKER; ASSISTANT PROFESSORS ALLISON, BACKUS, BRANN, DARLING; INSTRUCTORS ARNY, JOLIVETTE, HARE, HENRY, LARSON; LECTURER RICHARDS.

Courses 104, 220, 221, and 249 (*) are offered in the Department of Botany, College of Letters and Science, and do not count toward the credits required in the College of Agriculture.

7. ELEMENTARY PLANT PATHOLOGY. I; 3 cr. The economic importance, appearance, cause, and means for controlling representative diseases of plants. Prerequisites: Bot. 1 and Agr. Bact. 1. Mr. Riker, Mr. Dickson, and staff.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. 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: Plant Path. 7 or Agr. Bact. 1 and Plant Path. 104. Mr. Walker, Mr. Backus.

102. METHODS IN PLANT PATHOLOGY. I; 3 cr. Research procedures including: use of the literature, isolation and inoculation practices, special technique according to individual needs, and preparation of manuscripts. Prerequisite: Plant Path. 101. Mr. Riker.

*104. MORPHOLOGY OF FUNGI. I; 3 cr. (Same as Botany 104.) Prerequisite: Bot. 1. Mr. Gilbert.

116. DISEASES OF FIELD CROPS. II; 2 cr. Arranged to meet the needs of students in plant pathology and agronomy. Prerequisites: Plant Path. 101 (or 7 and 104). Offered 1945-46 and alternate years. Mr. Dickson.

117. DISEASES OF ORCHARD FRUITS. II; 2 cr. The more important diseases of deciduous orchard fruits. Prerequisites: Plant Path. 101 (or 7 and 104). Offered 1945-46 and alternate years. Mr. Keitt.

119. FUNGUS DETERIORATION OF FOREST PRODUCTS. I; 2 cr. (Same as Forest Products 119.) A survey of the cause and prevention of stains and decay in forest products, and control measures. Prerequisites: Plant Path. 101 and 104. Offered 1944-45 and alternate years. Miss Richards.

120. DISEASES OF VEGETABLE CROPS. II; 2 cr. The more important field and storage diseases of vegetable crops. Prerequisites: Plant Path. 101 (or 7 and 104). Offered 1944-45 and alternate years. Mr. Walker.

180. SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Staff.

*220. ADVANCED MYCOLOGY. Yr; 2 cr. (Same as Botany 220.) Prerequisites: Plant Path. 101 and 104. Offered 1944-45 and alternate years. Mr. Gilbert.

*221. CLASSIFICATION OF PARASITIC FUNGI. Yr; *cr. (Same as Botany 221.) Prerequisite: Bot. 104 or Plant Path. 101. Offered 1945-46 and alternate years. Mr. Backus, Mr. Green.

223. SEMINARY. Yr; 1 cr. Mr. Keitt and staff.

*249. SPECIAL PHYSIOLOGY OF PATHOGENIC FUNGI. II; 2-4 cr. (Same as Botany 249.) Prerequisite: Bot. 146. Staff.

POULTRY HUSBANDRY

PROFESSOR HALPIN, *chairman*, HAYES; ASSISTANT PROFESSORS ANNIN, CRAVENS, MCGIBBON.

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.

Students preparing for educational work along the more scientific lines should elect Chemistry 120, Biochem. 110, Zoology 105 and 109. Not to exceed five credits from the following courses may be counted as a portion of the major requirements in poultry husbandry: Veterinary Science 120, Animal Husbandry 126, Biochem. 110, Agricultural Economics 127, Agricultural Economics 128, Genetics 105.

1. POULTRY RAISING. I; 3 cr. A general survey course designed to give the student an understanding of the problems in poultry raising. Mr. Cravens, Mr. McGibbon.

8. MARKETING POULTRY PRODUCTS. I; 3 cr. A study of the facts that tend to produce quality in market poultry and eggs. Methods of preparing and marketing poultry and eggs. Mr. Annin.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.

102. POULTRY FEEDS AND FEEDING. I; 3 cr. Poultry feeds and formulation of poultry rations with special reference to the mineral, protein and vitamin requirements. Prerequisite: Poultry Husb. 1. Offered 1944-45 and alternate years. Mr. Halpin, Mr. Cravens.

105. HATCHERY MANAGEMENT. II; 3 cr. Factors influencing fertility and hatchability of eggs; practical chick-embryology; brooding requirements of baby chicks; cost of production and methods of marketing. Prerequisite: Poultry Husb. 1. Offered 1945-46 and alternate years. Mr. Cravens, Mr. McGibbon.

106. POULTRY JUDGING. I; 3 cr. Origin, history, and points of excellence of the various breeds and varieties of poultry. Inheritance of common characters in poultry. Prerequisite: Poultry Husb. 1 or Genetics 1 or consent of instructor. Offered 1945-46 and alternate years. Mr. Halpin, Mr. McGibbon.

107. ADVANCED POULTRY MANAGEMENT. II; 3 cr. Influences of recent investigations in poultry husbandry as they affect modern methods of feeding, housing, breeding, care and management of poultry. Prerequisite: Poultry Husb. 1. Offered 1944-45 and alternate years. Mr. Halpin.

180. SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Staff.

RURAL SOCIOLOGY

PROFESSOR KOLB, *chairman*; ASSOCIATE PROFESSORS BARTON, HILL, WILEDEN; ASSISTANT PROFESSOR CARTTER; INSTRUCTORS ANDERSEN, STENEHJEM.

There are two ways in which students may work in this field. First, a program leading to a full major and preparing for teaching, research, or extension work may be arranged. In such a plan 10 credits should be taken in the department and 5 credits selected in any one of the following departments: Agricultural Economics, Agricultural Education, Agricultural Journalism, Horticulture, Home Economics, or Sociology in the College of Letters and Science. Credits thus chosen in Letters and Science may count toward the major, but shall not be counted as a portion of the minimum number of credits required in agricultural subjects. Second, courses may be counted as electives by students majoring in other departments, who wish to gain a knowledge of the social arrangements of present-day rural society.

25. RURAL LIFE. I; 3 cr. Rural society; its people as families, neighborhoods, villages, interest groups, and town-country and rural-urban relations; its social institutions. Prerequisite: Sophomore standing. Mr. Kolb.

125. RURAL SOCIAL TRENDS. I; 2 cr. Advanced course in study of rural society through systematic examination of important source materials from Europe and America; recent findings in rural social trends. Prerequisite: Rural Soc. 25 or senior standing. Mr. Barton.

126. RURAL STANDARDS OF LIVING. II; 2 cr. Main elements composing standards of living, growth of a consumer consciousness, and governmental and cooperative agencies which give it expression. Prerequisite: Course in elementary sociology or consent of instructor. Mr. Barton.

127. RURAL COMMUNITY ORGANIZATION. II; 2 cr. History of the rural community and its social organization; principles, including leadership and processes of cooperation and conflict; agencies; studies of selected cases. Prerequisite: Rural Soc. 25 or its equivalent. Mr. Wileden.

180. SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Staff.

225. SEMINARY IN RURAL SOCIAL RESEARCH. Yr; 2 cr. Scope and method in current research: community organization, standards of living, population, farmers' organizations, social institutions, rural government. Prerequisite: Consent of instructor. Mr. Kolb.

SOILS

PROFESSORS CHAPMAN, GRAUL, TRUOG, *chairman*, ZEASMAN; ASSOCIATE PROFESSORS ALBERT, WILDE; ASSISTANT PROFESSORS BERGER, JACKSON, MUCKENHIRN; INSTRUCTORS ATTOE, HULL, TURNER.

The various courses in soils are designed to give training for either the more practical field such as farming and farm advisory and managerial work, or the professional field such as teaching, research, extension, soil survey, and soil conservation. Students preparing for the practical field should elect the less technical courses in soils and related agricultural departments; those preparing for professional work should elect considerable course work in the basic natural sciences along with the advanced courses in soils.

Not to exceed five credits from the following courses may be counted as a portion of the undergraduate major requirement in soils: Agricultural Bacteriology 123, Geology 1, Agronomy 102, and Agronomy 106.

1. SOILS AND SOIL FERTILITY. I; 4 cr. An introductory, general survey of the field. Prerequisite: Chem. 1a. Mr. Graul.

26. FERTILIZERS AND SOIL MANAGEMENT. II; 2 cr. Use, composition, and manufacture of fertilizers. Prerequisite: Soils 1. Mr. Graul.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.

106. SOIL EROSION: CAUSES AND CONTROL. I; 4 cr. (Same as Agricultural Engineering 106.) Causes and effects of soil erosion; soil management, engineering, and land use practices required for control. Field trips. Only two credits of this course may be applied toward a major in soils. Prerequisites: Soils 1 and Agr. Engr. 1 or consent of instructor. Mr. Muckenhirn, Mr. Zeasman.

121. SOIL ANALYSIS. II; 4 cr. Methods for determining soil reaction and available and total constituents. Prerequisite: Soils 1, Chem. 12, or consent of instructor. Mr. Jackson, Mr. Truog.

122. SOIL PHYSICS. II; 3 cr. Physical properties, moisture relations, and methods of physical analysis of soils. Prerequisites: Soils 1 and Chem. 12 or course in college physics. Mr. Jackson.

123. FOREST SOILS. II; 3 cr. Properties and management in relation to silviculture and nursery practice. Prerequisites: Soils 1 and Bot. 1, or graduate standing. Mr. Wilde.

125. SOIL GENESIS, CLASSIFICATION AND MAPPING. II; 3 cr. The formation, classification, and mapping of soils; the major soil areas and their uses. Field trips. Prerequisite: Soils 1 or consent of instructor. Mr. Muckenhirn.

127. SOIL SCIENCE AND PLANT NUTRITION. I; 2 cr. The constitution of the soil and how it functions as a medium for plant growth. Prerequisite: Soils 1 or graduate standing. Mr. Truog.

128. SEMINARY. I, II; 1 cr. Prerequisite: Senior standing or consent of instructor. First semester, Mr. Truog; second semester, Mr. Muckenhirn.

180. SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Staff.

VETERINARY SCIENCE

PROFESSORS BEACH, *chairman*, HADLEY, HERRICK; INSTRUCTORS MORGAN, WHITEHAIR, SPENCER.

The subjects described below are designed to afford the student an opportunity to learn those facts relative to the prevention and control of animal diseases that a livestock man

should know, and to give students an appreciation of the various branches of veterinary science.

Some of the courses numbered above 100 are comparable with courses offered in a regular veterinary curriculum; others are especially suited to the needs of advanced students in the College of Agriculture and to those who contemplate qualifying for the combined degrees of Bachelor of Science and Doctor of Veterinary Medicine.

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. Prerequisite: Sophomore standing. Mr. Hadley.

27. FUR FARMING. I; 2 cr. Theory and practice of propagating fur-bearing animals, emphasis on methods used by successful fur farmers. Prerequisite: A course in zoology. Offered 1945-46 and alternate years. Mr. Whitehair.

28. PRINCIPLES OF VETERINARY SCIENCE. I; 2 cr. Nature and causes of diseases of farm animals. Prerequisite: Sophomore standing. Offered 1944-45 and alternate years. Mr. Hadley.

29. ANIMAL DISEASE PREVENTION. II; 3 cr. Prevention and control of diseases of livestock and poultry. Prerequisite: Sophomore standing. Mr. Beach.

100. THESIS. Yr; 2 cr. Prerequisites: Senior standing and consent of instructor. Staff.

120. PARASITES OF DOMESTIC ANIMALS. I; 3 cr. Structure, life history, diagnosis and prevention of parasites of the lower animals. Prerequisites: Zool. 1 or Vet. Sci. 1. Mr. Herrick.

126. INFECTION AND IMMUNITY. II; 3 cr. An experimental study of the principles of infection and immunity. Prerequisite: A course in bacteriology. Offered 1944-45 and alternate years. Mr. Hadley, staff.

180. SPECIAL PROBLEMS. I, II; *cr. Prerequisites: Senior standing and consent of instructor. Staff.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Staff.

WILDLIFE MANAGEMENT

PROFESSOR LEOPOLD, *chairman*.

The courses in wildlife management are of two kinds: those intended to give the general student an understanding of wildlife as a natural resource, and those intended to train specialized students for professional practice.

Course 118 is for the general student. Familiarity with common wild plants and animals and with farming practice is desirable as a basis for this course.

Courses 161 and 200 are intended for professional students only, but Course 161 is open to others who show special qualifications and need. A bi-weekly non-credit seminar is held for students enrolled in Courses 161 and 200.

Professional training in wildlife management covers the animal conservation field and requires from two to five years of graduate work. The number of professional students accepted as candidates for an advanced degree in wildlife management is limited to five at one time, and these are recruited by selection. To be selected, a student should (1) have a bachelor's degree; (2) be proficient in the fields of ornithology, field mammology, and field botany; (3) be skillful in reading evidence in the field; (4) be able to express himself clearly in writing; and (5) be familiar with land industries.

Students desiring to prepare themselves for professional training should major as undergraduates in some biological field, such as botany, zoology, agronomy, or soils.

Information on assistantships and fellowships, available for those planning to take professional training in wildlife management, may be obtained by writing to the Chairman of the Department of Wildlife Management.

118. WILDLIFE ECOLOGY. II; 3 cr. Structure and properties of the animal community; its relation to plants, soils, and land use. Field techniques; review of problems; history and economics of wildlife. Mr. Leopold.

161. WILDLIFE MANAGEMENT TECHNIQUES. I; *cr. Preparation of collections; analysis of stomachs and pellets; sex and age determinations; censuses; trapping and banding; planting food and cover; analysis of data; carding literature. Prerequisites: Wildlife Management 118 and consent of instructor. Mr. Leopold.

200. RESEARCH. Yr; *cr. Prerequisites: Graduate standing and consent of instructor. Mr. Leopold.

APPENDIX

SECTION I—MAJORS IN AGRICULTURAL SCIENCE

Many of the Wisconsin College of Agriculture students in the past have entered some phase of agricultural science and it seems probable that this field will continue to provide many opportunities. In this field high scholarship is a necessity; only those students whose work in the first two years is of high quality should plan to enter the field. The Graduate School at Wisconsin requires for entrance an average undergraduate record of 1.5 grade-points per credit.

Students wishing to prepare themselves in Agricultural Science find it necessary to follow their undergraduate work with further training along some particular line leading to the master's or doctor of philosophy degree. For such students it is usually desirable to carry a broad general course as an undergraduate. The three general fields of particular importance are Animal Science, Plant Science, and Social Science.

All of the general college requirements, including the required courses of the freshman and sophomore years, must be met by students majoring in any of these fields. The majors outlined below follow the regulations with respect to a split major.

These majors have been approved by the Executive Committee and no special action is necessary by the student or adviser other than a statement by the student of his intention to follow one of these majors.

1—ANIMAL SCIENCE MAJOR

Students carrying this undergraduate major may later wish to carry graduate work in some of the following departments: Agricultural Bacteriology, Animal Husbandry, Biochemistry, Dairy Husbandry, Dairy Industry, Economic Entomology, Genetics, Poultry Husbandry and Veterinary Science. The major requirements will be absolved by carrying not less than 25 credits selected from the following list of courses:

	Credits
Agr. Bact. 121—Dairy bacteriology	3
Agr. Bact. 125—Food bacteriology	3
Agr. Bact. 126—Physiology of bacteria	3
Agr. Bact. 130—Identification and classification of bacteria	2 or 4
An. or Dy. Husb. 126—Livestock feeding	4
Biochem. 110—Principles of biochemistry	3 or 5
Biochem. 121—Dairy chemistry	3
Biochem. 125—Animal metabolism and vitamins	3-4
Dairy Ind. 124—Physical chemistry of dairy products	3
Econ. Ent. 2—Insect morphology and taxonomy	3
Econ. Ent. 140—Insect ecology	3
Genetics 1—Principles of breeding	4
Genetics 105—Animal genetics	3
Poultry Husb. 107—Advanced poultry management	3
Vet. Science 120—Parasites of domestic animals	3
Vet. Science 126—Infection and immunity	3
Thesis	4

53-58

Students in this major must also carry at least 20 (24)* elective credits outside of the College of Agriculture. Basic science is recommended. It will also be desirable for students in this major to carry two years of at least one foreign language.

* Figures in parentheses () apply to students who entered college before September 1, 1939.

2—PLANT SCIENCE MAJOR

Students carrying this undergraduate major may later wish to carry graduate work in some one of the following departments: Agricultural Bacteriology, Agronomy, Biochemistry, Economic Entomology, Genetics, Horticulture, Plant Pathology, or Soils. The major requirements will be absolved by carrying not less than 25 credits selected from the following list:

		Credits
Agr. Bact.	123—Soil bacteriology	3
Agr. Bact.	126—Physiology of bacteria	3
Agronomy	102—Pastures and pasture problems	2
Agronomy	130—Improvement of agronomic plants	2-3
Biochemistry	110—Principles of biochemistry	3 or 5
Biochemistry	120—Plant biochemistry	2-5
Econ. Ent.	2—Insect morphology and taxonomy	3
Econ. Ent.	140—Insect ecology	3
Genetics	1—Principles of breeding	4
Genetics	104—Plant genetics	3
Horticulture	7—Plant propagation	2
Horticulture	122—Advanced pomology	2 or 4
Plant Path.	7—Elementary plant pathology	3
Plant Path.	101—Diseases of plants	3
Soils	26—Fertilizers and soil management	2
Soils	125—Soil genesis, classification and mapping	3
Soils	127—Soil science and plant nutrition	2
Thesis		4
		49-57

Students in this major must also carry at least 20 (24)* elective credits outside of the College of Agriculture. Basic science is recommended. It will also be desirable for students in this major to carry two years of at least one foreign language.

3—SOCIAL SCIENCE MAJOR

Students carrying this undergraduate major may later wish to carry graduate work in some one of the following departments: Agricultural Economics, Agricultural Education, Agricultural Journalism, or Rural Sociology. The major requirements will be absolved by carrying not less than 25 credits selected from the following list:

		Credits
Agr. Econ.	10—Farm organization and management	3
Agr. Econ.	14—Farm business and legal practice	3
Agr. Econ.	117—Outlines of land economics	3
Agr. Econ.	126—International trade in agr. prod.	3
Agr. Econ.	127—Cooperation	3
Agr. Econ.	128—Marketing agricultural products	3
Agr. Econ.	152—Farmer movements	3
Agr. Econ.	155—Prices of agricultural products	3
Agr. Educ.	103—Seminary	1-3
Agr. Educ.	111—Ext. work in agr. and home ec.	3
Agr. Journ.	1—Agricultural news writing	3
Agr. Journ.	3—Agricultural advertising	3
Agr. Journ.	103—Publicity media and methods	2
Rural Soc.	25—Rural life	3
Rural Soc.	125—Rural social trends	2
Rural Soc.	126—Rural standards of living	2
Rural Soc.	127—Rural community organization	2
Thesis		4
		49-51

Students in this major must also choose at least 20 (24)* elective credits outside of the College of Agriculture. It is suggested that these credits be selected from the courses in the following group. Two full years of at least one foreign language is also desirable.

* Figures in parentheses () apply to students who entered college before September 1, 1939.

	Credits
Economics	134—Economic history of the U. S. 2-3
Economics	105—Money and banking 3
Economics	124—Taxation 3
Economics	130—Statistical methods ¹ 3
Economics	142—Public utilities 3
Economics	173—Economics of consumption 3
Geography	106—Agricultural geography 3
Journalism	2—Newspaper reporting 3
Journalism	3—Newspaper desk work 3
Journalism	107—The community newspaper 3
Pol. Science	7—American government (national) 3
Sociology	1—Introductory sociology 3
Sociology	3—Introduction to anthropology 3
Sociology	132—Introductory social statistics ¹ 3
Sociology	139—Social psychology 3
Sociology	140—Principles of sociology 3
Sociology	197—Personality and social adjustment 3
Speech	8—Extempore speaking 2

52-53

¹The two statistical courses are to be considered as parallel; only one is to be chosen.

PRE-THEOLOGICAL MAJOR

The University of Wisconsin, in cooperation with various theological seminaries, offers an opportunity for young men and women who are preparing for the rural ministry, to carry their pre-theological work in the College of Agriculture. Any person choosing this major should acquaint himself with the specific requirements of the theological seminary of his choice. Special note should be taken of any language requirements.

It is recommended that the student choosing this major shall follow the general plan of the Social Science major suggested above but shall make his choices in such a way as to secure at least one basic course in each of the following fields: Agricultural Economics, Economics (general), English Literature, History and Government, Philosophy, Psychology, Public Speaking, Sociology (general), and Rural Sociology.

SPLIT MAJORS

For many years, a large number of graduates of the Agricultural College have entered various industries related to agriculture, and the opportunities in this field seem to be increasing. Positions in rural banks, in the management of cooperative organizations and other agricultural enterprises closely related to agriculture, offer further opportunities for the agricultural college graduate with the proper training. Some of the more important fields are:

- 1—The Canning Industry
- 2—The Meat and Poultry Products Industries
- 3—The Dairy Manufacturing Industry
- 4—The Livestock Feed Industry
- 5—The Agricultural Equipment Industry
- 6—The Fertilizer Industry
- 7—The Seed Industry
- 8—The Grain Marketing and Processing Industries

Other fields that are of interest to some students are:

- 1—Food Technology
- 2—Soil Conservation

During the freshman and sophomore years, the student carries the subjects of the agricultural curriculum as outlined on page 13. It will be desirable for the students to secure Mathematics 7, Economics 1b, and a course in speech during the sophomore year. Each of the majors as described below carries recommendations regarding sophomore options.

* Figures in parentheses () apply to students who entered college before September 1, 1939.

and the description of the major should be consulted before making out the program of the sophomore year.

In the junior and senior years the student will carry 15 (16)* to 17 (18)* credits each semester. He will satisfy the requirements of the split major as described below. In addition he must select at least 20 (24)* credits outside of the College of Agriculture. Suggested courses are listed under the Commerce Section on this page.

The major for each industry consists of two parts, a *Commerce Section* and an *Industrial Section*. The Commerce Section is common to each of the industrial majors. The Industrial Section is dependent upon the field of interest.

AGRICULTURAL INDUSTRY AND COMMERCE SPLIT MAJORS

COMMERCE SECTION

In each of the eight industrial majors a minimum of 5 credits must be selected from the following list of courses in Agricultural Economics and Agricultural Journalism.

		Credits
Agr. Econ.	10—Farm organization and management	3
Agr. Econ.	14—Farm business and legal practice	3
Agr. Econ.	126—International trade in agr. prod.	3
Agr. Econ.	127—Cooperation	3
Agr. Econ.	128—Marketing agricultural products	3
Agr. Econ.	155—Prices of agricultural products	3
Agr. Journ.	1—Agricultural news writing	3
Agr. Journ.	3—Agricultural advertising	3
Agr. Journ.	103—Publicity media and methods	2
		26

ELECTIVES OUTSIDE THE COLLEGE OF AGRICULTURE

The College of Agriculture curriculum prescribes that each student must select at least 20 (24)* credits of non-required courses outside of the College of Agriculture. For students interested in industrial work it is suggested, but not required, that these 20 (24)* credits be elected from the following group. More than 20 (24)* credits may be taken profitably.

		Credits
Commerce	6—Business communication	3
Commerce	8—Elements of accounting	3
Commerce	13—Marketing methods	3
Commerce	15—Principles of advertising	2
Commerce	31—Business statistics	3
Commerce	43—Business ethics	2
Commerce	105—Money and banking	3
Commerce	109—Commercial law	3
Commerce	114—Marketing management	3
Economics	134—Economic history of the United States	2-3
Economics	146—Government and business	3
Economics	171—Personnel management	3
Geography	106—Agricultural geography	3
		36-37

INDUSTRIAL SECTION

Before the second semester of the sophomore year the student will consult the assistant dean for assignment to an adviser, under whose direction a group of properly related courses will be selected, pertaining to the particular field in which he is interested.

The Executive Committee has approved the following list of groups of studies to meet the requirements of a split major, and no special action is necessary by the student or the adviser other than a statement by the student of his intention to follow one of these majors. Other groups may be selected for a split major to meet a specific need. *If another grouping*

* Figures in parentheses () apply to students who entered college before September 1, 1939.

is selected it must be approved by the Executive Committee not later than the middle of the junior year.

The student should recognize that the requirements of the split major represent the minimum for graduation. In order to prepare himself properly for the work in the particular industry selected, the student should carry considerably more than the minimum, both in the commercial courses and in the technical courses.

The student will select a minimum of 20 credits from one of the eight following industrial majors, and 5 credits from the Commerce Section on page 41.

1. THE CANNING INDUSTRY

For a major in the Canning Industry a minimum of 20 credits must be selected from this list and in addition 5 credits must be selected from the Commerce Section on page 41.

		Credits
Agr. Bact.	125—Food bacteriology	3
Agr. Engr.	5—Power and machinery	5
Agronomy (or Horticulture)	16—Crop identification and standards	2
Agronomy	120—Seed and weed control	3
Agronomy	130—The improvement of agronomic plants	2-3
Biochemistry	1—Elementary biochemistry	2 or 4
Biochemistry	110—Principles of biochemistry	3 or 5
Dairy Ind.	108—Dairy mechanics	3
Dairy Ind.	124—Physical chemistry of dairy products	3
Econ. Ent.	105—Field crop and garden insects	2
Horticulture	3—Vegetable gardening	3
Plant Path.	7—Elementary plant pathology	3
Plant Path.	101—Diseases of plants	3
Plant Path.	120—Diseases of vegetable crops	2
Soils	26—Fertilizers and soil management	2
		41-46

In the sophomore year Soils 1, Economic Entomology 1, and Horticulture 1 should be selected.

2. THE MEAT AND POULTRY PRODUCTS INDUSTRIES

For a major in the Meat and Poultry Products Industries a minimum of 20 credits must be selected from this list and in addition 5 credits must be selected from the Commerce Section on page

		Credits
Agr. Bact.	121—Dairy bacteriology	3
Agr. Bact.	125—Food bacteriology	3
Animal Husb.	3—Livestock selection	1-2
Animal Husb.	5—Meat production and carcass values	2
An. or Dy. Husb.	126—Livestock feeding	4
Animal Husb.	130—Swine and sheep production	3
Animal Husb.	131—Horse and beef cattle production	3
An. or Dy. Husb.	135—Seminary	1
Poultry Husb.	1—Poultry raising	3
Pou'try Husb.	8—Marketing poultry products	3
Poultry Husb.	102—Poultry feeds and feeding	3
Poultry Husb.	105—Hatchery management	3
Poultry Husb.	106—Poultry judging	3
Poultry Husb.	107—Advanced poultry management	3
Vet. Science	28—Principles of veterinary science	2
Vet. Science	29—Animal disease prevention	3
		43-44

In the sophomore year Biochemistry 1, Veterinary Science 1, and Dairy Husbandry 1 should be selected.

3. THE DAIRY MANUFACTURING INDUSTRY

For a major in the Dairy Manufacturing Industry a minimum of 20 credits must be selected from this list and in addition 5 credits must be selected from the Commerce Section on page 41.

		Credits
Agr. Bact.	121—Dairy bacteriology	3
Agr. Bact.	125—Food bacteriology	3
Agr. Bact.	130—Identification and classification of bacteria	2 or 4
Animal Husb.	5—Meat production and carcass values	2
Dairy Ind.	103—Creamery operation and management	3
Dairy Ind.	104—Cheese	4
Dairy Ind.	105—Market milk	3
Dairy Ind.	106—Ice cream and condensed milk products	3
Dairy Ind.	108—Dairy mechanics	3
Dairy Ind.	123—Seminary	2
Dairy Ind.	180—Special problems	1-3
Drawing	1—Elements of drawing	3
Poultry Husb.	8—Marketing poultry products	3
		35-39

In the sophomore year Biochemistry 1, Dairy Industry 1, and Agricultural Engineering 5 should be selected.

4. THE LIVESTOCK FEED INDUSTRY

For a major in the Livestock Feed Industry a minimum of 20 credits must be selected from this list and in addition 5 credits must be selected from the Commerce Section on page 41.

		Credits
Agr. Econ.	106—Crop and livestock estimating	3
Agronomy	102—Pastures and pasture problems	2
Agronomy	106—Forage problems	3
Animal Husb.	2—History of breeds	2
Animal Husb.	3—Livestock selection	2
Animal Husb.	5—Meat production and carcass values	2
Animal Husb.	130—Swine and sheep production	3
Animal Husb.	131—Horse and beef cattle production	3
An. or Dy. Husb.	126—Livestock feeding	4
An. or Dy. Husb.	134—Livestock breeding	3
An. or Dy. Husb.	135—Seminary	1
Dairy Husb.	133—Dairy cattle and milk production	3
Poultry Husb.	1—Poultry raising	3
Poultry Husb.	107—Advanced poultry management	3
Soils	1—Soils and soil fertility	4
Vet. Science	28—Principles of veterinary science	2
Vet. Science	29—Animal disease prevention	3
		46

In the sophomore year Biochemistry 1, Poultry Husbandry 1, and Dairy Industry 1 should be selected.

5. THE AGRICULTURAL EQUIPMENT INDUSTRY

For a major in the Agricultural Equipment Industry a minimum of 20 credits must be selected from this list and in addition 5 credits must be selected from the Commerce Section on page 41.

		Credits
Agr. Engr.	1—Surveys and structures	4
Agr. Engr.	5—Power and machinery	5
Agr. Engr.	9—Farm mechanics	3
Agr. Engr.	100—Thesis	4
Agr. Engr.	105—Farm tractors and tractor machinery	4
Agr. Engr.	121—Seminary	1
Agronomy	104—Grain crops	3
Agronomy	120—Seed and weed control	3
An. or Dy. Husb.	126—Livestock feeding	4
Chemical Engr.	8—Metallography	2
Dairy Industry	108—Dairy mechanics	3
Econ. Ent.	1—Elementary entomology	3
Physics	61—General physics	5
Plant Path.	7—Elementary plant pathology	3
Plant Path.	101—Diseases of plants	3
Poultry	107—Advanced poultry management	3
Soils	26—Fertilizers and soil management	2
		55

In the sophomore year Poultry Husbandry 1, Dairy Industry 1, and Soils 1 should be selected.

6. THE FERTILIZER INDUSTRY

For a major in the Fertilizer Industry a minimum of 20 credits must be selected from this list and in addition 5 credits must be selected from the Commerce Section on page 41.

	Credits
Agronomy	102—Pastures and pasture problems 2
Agronomy	106—Forage problems 3
Agr. Bact.	123—Soil bacteriology 3
Biochemistry	120—Plant biochemistry 2-5
Botany	146—Plant physiology 4
Chemistry	120—Organic chemistry 4
Chemistry	148—Introduction to physical and colloidal chemistry 3-5
Plant Path.	7—Elementary plant pathology 3
Plant Path.	101—Diseases of plants 3
Soils	26—Fertilizers and soil management 2
Soils	121—Soil analysis 4
Soils	127—Soil science and plant nutrition 2
Soils	128—Seminary 1
	36-41

In the sophomore year Soils 1, Horticulture 1, and Agricultural Engineering 5 should be selected.

7. THE SEED INDUSTRY

For a major in the Seed Industry a minimum of 20 credits must be selected from this list and in addition 5 credits must be selected from the Commerce Section on page 41.

	Credits
Agronomy (or Horticulture)	16—Crop identification and standards 2
Agronomy	102—Pastures and pasture problems 2
Agronomy	104—Grain crops 3
Agronomy	106—Forage crops 3
Agronomy	120—Seed and weed control 3
Agronomy	130—Improvement of agronomic plants 2-3
Botany	129—Classification of cultivated plants 2-3
Botany	146—Plant physiology 4
Econ. Ent.	1—Elementary entomology 3
Econ. Ent.	105—Field crop and garden insects 2
Genetics	1—Principles of breeding 4
Genetics	104—Plant genetics 3
Horticulture	6—Principles of landscape design 3
Horticulture	7—Plant propagation 2
Plant Path.	7—Elementary plant pathology 3
Plant Path.	101—Diseases of plants 3
Plant Path.	116—Diseases of field crops 2
Plant Path.	120—Diseases of vegetable crops 2
Soils	26—Fertilizers and soil management 2
Soils	125—Soil genesis, classification and mapping 3
	53-55

In the sophomore year Soils 1, Economic Entomology 1, and Horticulture 3 should be selected.

8. THE GRAIN MARKETING AND PROCESSING INDUSTRIES

For a major in the Grain Marketing and Processing Industries, a minimum of 20 credits must be selected from this list and in addition 5 credits must be selected from the Commerce Section on page 41.

	Credits
Agr. Bact.	125—Food bacteriology 3
Agr. Bact.	126—Physiology of bacteria 3
Agr. Econ.	106—Crop and livestock estimating 3
Agronomy (or Horticulture)	16—Crop identification and standards 2

		Credits
Agronomy	104—Grain crops	3
Agronomy	120—Seed and weed control	3
Agronomy	130—Improvement of agronomic plants	2-3
Biochemistry	110—Principles of biochemistry	3 or 5
Botany	129—Classification of cultivated plants	2-3
Botany	146—Plant physiology	4
Chemistry	12—Quantitative analysis	3
Chemistry	120—Organic chemistry	4
Chemistry	148—Introduction to physical and colloidal chemistry	3-5
Genetics	1—Principles of breeding	4
Plant Path.	7—Elementary plant pathology	3
Plant Path.	101—Diseases of plants	3
Plant Path.	116—Diseases of field crops	2
		50-56

In the sophomore year Biochemistry 1, Agricultural Engineering 5, Economic Entomology 1, or Horticulture 1 should be selected.

OTHER SPLIT MAJORS

1. FOOD TECHNOLOGY

There is an increasing demand in the food industries and related fields for workers especially trained to work in the laboratories and in the plants. The major in Food Technology should aid the student in obtaining a position and should help in his advancement. The major also may serve as a general preparation for specialized graduate work in some phase of food technology.

A minimum of 25 credits must be chosen from this group for a split major:

		Credits
Agr. Bact.	121—Dairy bacteriology	3
Agr. Bact.	125—Food bacteriology	3
Agr. Bact.	126—Physiology of bacteria	3
Agr. Bact.	130—Identification and classification of bacteria	2 or 4
Agr. Econ.	128—Marketing agricultural products	3
Agronomy (or Horticulture)	16—Crop identification and standards	2
Animal Husb.	5—Meat production and carcass values	2
Biochemistry	110—Principles of biochemistry	3 or 5
Biochemistry	121—Dairy chemistry	2 or 5
Biochemistry	126—Modern views of animal nutrition and their application	2
Chem. Engr.	15—Industrial chemistry	2 or 3
Chemistry	146-147—Chemistry of foods and their adulteration	3-5
Dairy Ind.	108—Dairy mechanics	3
Dairy Ind.	124—Physical chemistry of dairy products	3
Poultry Husb.	8—Marketing poultry products	3
		39-49

In the sophomore year Biochemistry 1 or 3, Dairy Industry 1, and Agricultural Engineering 5 should be selected. Both Botany 1 and Zoology 1 should be taken.

Recommended as electives to supplement the split major are the following courses:

		Credits
Agr. Econ.	126—International trade in agricultural products	3
Agr. Econ.	155—Prices of agricultural products	3
Agr. Engr.	9—Farm mechanics	3
Agr. Journ.	3—Agricultural advertising	3
Agr. Journ.	103—Publicity media and methods	2
Biochemistry	125—Animal metabolism and vitamins	3-4
Biochemistry	127—Fermentation biochemistry	2-4
Botany	104—Morphology of fungi	3
Botany	111—Microscopical examination of drugs and foods	3
Chemistry	113—Water analysis	1

		Credits
Commerce	6—Business communication	3
Drawing	1—Elements of drawing	3
Mathematics	135—Introduction to statistical methods in natural sciences	3
Physics	61—General physics	5

40-43

2. SOIL CONSERVATION

Students desiring to prepare for work in Soil Conservation should select either the engineering or the soils-crops aspect of the subject. A student selecting the engineering aspect should choose the Civil Engineering curriculum outlined by the Department of Agricultural Engineering. Anyone selecting the soils-crops aspect of conservation should choose as his adviser a representative of the Department of Soils or Agronomy not later than the beginning of the junior year. A student must also obtain practical farm experience.

During the freshman and sophomore years the student carries the subjects of the agricultural curriculum as outlined on page 13.

In the sophomore year Soils 1, Agricultural Engineering 1, and Economic Entomology 1 should be selected. In the junior and senior years the student will carry 15 (16)* to 17 (18)* credits each semester. He will satisfy the requirements of a major in the soils-crops aspect of soil conservation by selecting at least 25 credits from the following subjects. (Courses preceded by a dagger [†] should be taken in the junior year.)

		Credits
Agr. Econ.	117—Outlines of land economics	3
Agr. Engr.	5—Power and machinery	5
Agr. Engr.	101—Drainage and irrigation engineering	2
†Agronomy	102—Pastures and pasture problems	2
†Agronomy	106—Forage problems	3
Botany	129—Classification of cultivated plants	2-3
†Geology	1—General geology	5
Civil Engr.	118—Short course in surveying	3
Geology	136—Principles of erosion	2
Hydraulics	181—Hydrology	2
Soils	26—Fertilizers and soil management	2
†Soils or		
Agr. Engr.	106—Soil erosion, causes and control	4
Soils	122—Soil physics	3
Soils	125—Soil genesis, classification and mapping	3

41-42

The College of Agriculture curriculum requires that the student must select at least 20 (24)* credits of non-required courses outside of the College of Agriculture. It is recommended that the following courses be included in this requirement: Botany 164, 3 cr.; Geography 128, 3 cr.; Geography 140, 3 cr.; Geology 133, 3 cr.; and Geology 136, 2 cr.

Following is a list of other helpful courses which should be given preference in completing the required amount of work for graduation: Agricultural Economics 10, 3 cr.; Agricultural Economics 14, 3 cr.; Agronomy 120, 3 cr.; Animal Husbandry 126, 4 cr.; Agricultural Bacteriology 123, 3 cr.; Forest Products 1, 2 cr.; Horticulture 7, 2 cr.; Soils 123, 3 cr.; and Soils 127, 2 cr.

SECTION II—ADVANCED INDEPENDENT WORK

A student who has taken his freshman and sophomore work at the University of Wisconsin, whose grade-point average for these first two years of work is 2.6 or higher, and who is recommended by three of his sophomore instructors, may be permitted by the major division or department of his choice to pursue Advanced Independent Work during the remainder of his course.

* Figures in parentheses () apply to students who entered college before September 1, 1939.

At the inception of this Advanced Independent Work, the major division or department shall outline for the student a five-semester plan of study, a whole or part of which is to be pursued independently of course and classroom requirements, and which shall include a thesis. Upon recommendation of the division or department and upon approval by the Graduate Office of work done on the thesis, such a student may be admitted to the Graduate School at the end of the seventh semester, thereby becoming subject to its regulations and eligible for its scholarships. The student who, at the close of the eighth semester, has met the general requirements outside the major, has passed a comprehensive examination set by the division or department and covering his last four semesters of work within the major, and is recommended by his division or department and by the College of Agriculture, shall be granted the bachelor degree. If the program is followed during the next semester, the student who has passed a comprehensive examination set by the division or department covering his work within the major, has had his completed thesis approved by a committee of three appointed by the Graduate Office, and is recommended by his division or department and by the Graduate School, shall be granted the master's degree at the end of the ninth semester.