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The Bulletin of the UNIVERSITY of MINNESOTA

The College of Agriculture, Forestry,
and Home Economics
Announcement of Courses for the Years
1945-1947

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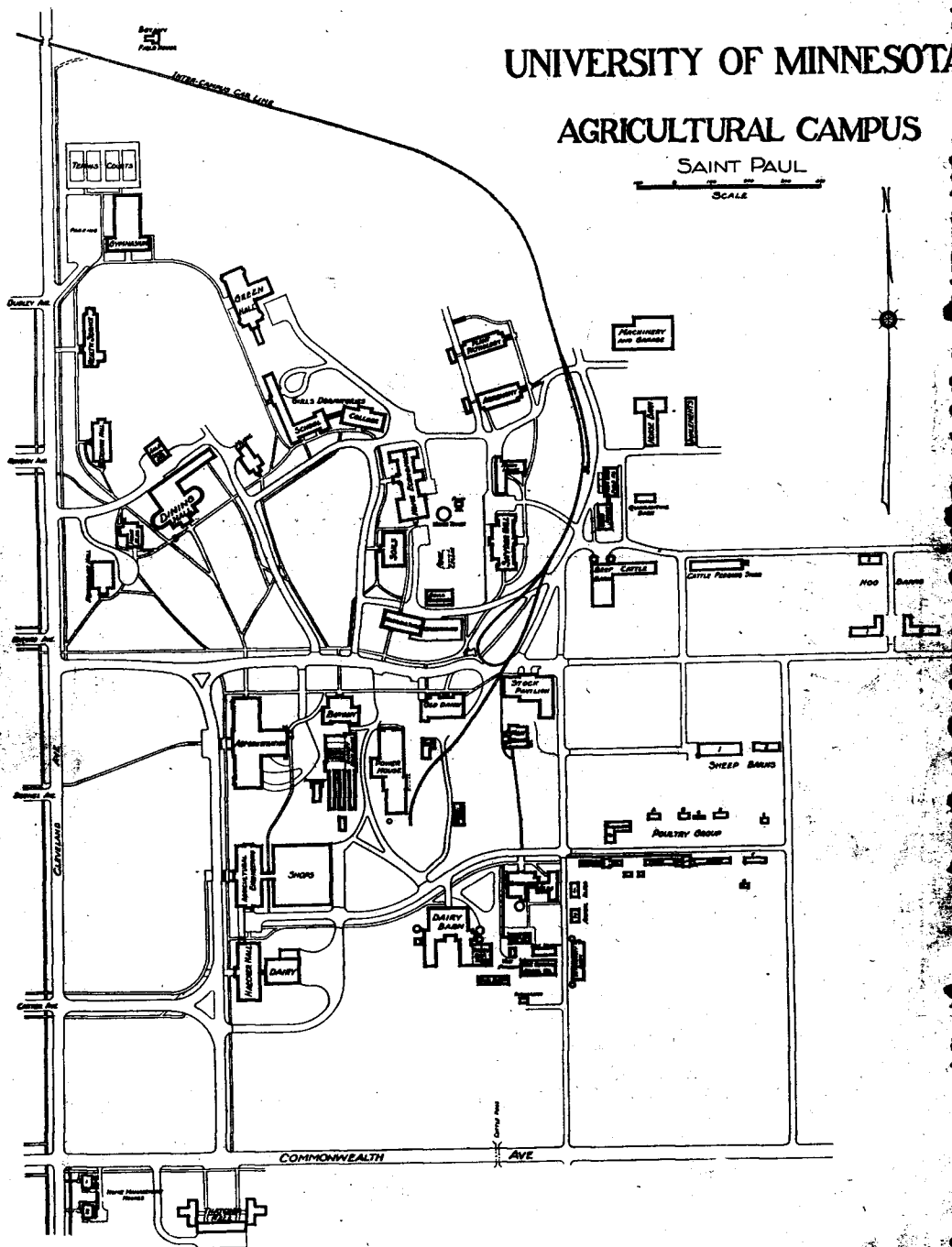
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UNIVERSITY OF MINNESOTA

AGRICULTURAL CAMPUS

SAINT PAUL

SCALE



THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

FACULTY

ADMINISTRATION

J. L. Morrill, B.A., LL.D., President
Malcolm M. Willey, Ph.D., L.H.D., Vice President, Academic Administration
Clyde H. Bailey, Ph.D., Dean of the Department of Agriculture and Director of Agricultural Experiment Station
Henry Schmitz, Ph.D., Dean of the College of Agriculture, Forestry, and Home Economics and Chief of Division of Forestry
Edmund G. Williamson, Ph.D., Dean of Students
Anne D. Blitz, M.A., LL.D., Dean of Women
William S. Carlson,* Ph.D., Director of Admissions and Records
True E. Pettengill, M.S., Acting Director of Admissions and Records and Recorder
Forrest R. Immer, Ph.D., Associate Director of the Agricultural Experiment Station and Professor of Agronomy and Plant Genetics

AGRICULTURAL BIOCHEMISTRY

Professors William F. Geddes, Ph.D., Clyde H. Bailey, Ph.D., David R. Briggs, Ph.D., W. Martin Sandstrom, Ph.D.; Associate Professor Cornelia Kennedy, Ph.D.; Assistant Professors Fred L. Greenwood, Ph.D., Floyd C. Olson, Ph.D., Robert Jenness, Ph.D.; Instructor Donald E. Smith, M.S.

AGRICULTURAL ECONOMICS

Professors Oscar B. Jesness, Ph.D., Austin A. Dowell, Ph.D., George A. Pond, Ph.D., Warren C. Waite, Ph.D.; Associate Professor E. Fred Koller, Ph.D.; Assistant Professors Rex W. Cox, Ph.D., Selmer E. Engene, Ph.D.; Instructors Harlow W. Halverson,* M.S., Percy M. Lowe, M.S.

AGRICULTURAL EDUCATION

Professor Albert M. Field, Ph.D.; Assistant Professor George F. Ekstrom, Ph.D.

AGRICULTURAL ENGINEERING

Professors Arthur J. Schwantes, M.S. (Ag.E.), Associate Professors Andrew Hustrulid, Ph.D., Philip W. Manson, M.S. (Ag.E.), Charles K. Otis, B.S. (M.E.); Assistant Professors Evan R. Allred, M.S. (Ag.E.), Clarence H. Christopherson M.A., James B. Torrance, B.S. (Agr.), Arthur G. Tyler, B.S. (M.E.), Hall B. White, M.S. (Ag.E.); Instructors J. Grant Dent, Joseph K. Park, M.S. (Ag.E.), John Strait, B.S. (M.E.).

AGRONOMY AND PLANT GENETICS

Professors Herbert K. Hayes, D.Sc., Charles R. Burnham, Ph.D., Forrest R. Immer, Ph.D.; Associate Professors Albert C. Arny, M.S., Ray S. Dunham, M.S., Assistant Professors Ernest H. Rinke, Ph.D., Horace L. Thomas, Ph.D.; Instructor Merlin T. Henderson, M.S.

* On leave.

ANIMAL AND POULTRY HUSBANDRY

ANIMAL HUSBANDRY

Professors Walter H. Peters, M.Agr., Evan F. Ferrin, M.Agr., Laurence M. Winters, Ph.D.; Associate Professors Philip A. Anderson, B.S. in Agr., Alfred L. Harvey, Ph.D.; Assistant Professors Willard W. Green, Ph.D., Hamilton A. Stewart, Ph.D.; Instructor Elmer H. Ziegenhagen, M.S.

POULTRY HUSBANDRY

Professor Hubert J. Sloan, Ph.D.; Associate Professor Thomas H. Canfield, M.S.; Instructor Robert N. Shoffner, M.S.

DAIRY HUSBANDRY

Professors James B. Fitch, M.S., Willes B. Combs, M.A., Harold Macy, Ph.D., William E. Petersen, Ph.D., Samuel T. Coulter, Ph.D.; Assistant Professors Lester O. Gilmore, Ph.D., Thor W. Gullickson, Ph.D.; Lecturer, Walter L. Slatter, M.S.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors Clarence E. Mickel, Ph.D., Alexander A. Granovsky, Ph.D.; Associate Professors Mykola H. Haydak, Ph.D., Alexander C. Hodson, Ph.D., William H. Marshall, Ph.D., A. Glenn Richards, Ph.D.

FORESTRY

Professors Henry Schmitz, Ph.D., John H. Allison, Ph.B., M.F., Edward G. Cheyney, B.A., Frank H. Kaufert, Ph.D.; Associate Professors Thorwald Schantz-Hansen, Ph.D., Randolph M. Brown, B.S., M.F., Louis W. Rees, Ph.D.; Instructor Yale Weinstein, B.S.

HOME ECONOMICS

Professors Wylle B. McNeal, M.A., Alice Biester, M.A., Harriet I. Goldstein, Jane M. Leichsenring, Ph.D., Isabel Noble, Ph.D.; Associate Professors Eva G. Donelson, Ph.D., Frances Dunning, M.S., Ethel L. Phelps, M.S.; Assistant Professors Vetta Goldstein, Loritsa Sheldon, M.S., Lucy A. Studley, M.A.; Instructors Carlotta M. Brown, Ethel R. Gorham, M.A., Louise S. Greenwood, B.S., Elizabeth Hepworth, M.S., Kathleen M. Jeary, M.A., Hedda Kafka, M.A., Ruth Montgomery, M.S., Juliette Myren, M.S., Marguerite Paulsen, M.S., Louise Seiter Leavitt, M.S., Florence Turnbull, M.S., Juanita Walter, M.A., Catherine Zander, M.S.

HOME ECONOMICS EDUCATION

Professors Wylle B. McNeal, M.A., Clara M. Brown, M.A., Harriet I. Goldstein, Ella J. Rose, Ph.D.; Instructors Anna M. Krost, M.S., Etheldreda Radulescu, M.A., Eudora K. Waddell, M.S.

HORTICULTURE

Professors William H. Alderman, B.S.A., Wilfrid G. Brierley, Ph.D., Rodney B. Harvey, Ph.D., Fred A. Krantz, Ph.D.; Associate Professors Troy M. Currence, Ph.D., Arthur N. Wilcox, Ph.D.; Assistant Professors Arthur E. Hutchins, Ph.D., Lewis E. Longley, Ph.D., Theodore S. Weir, M.S.; Instructor Robert A. Phillips,* B.S.

* On leave.

PLANT PATHOLOGY AND BOTANY

Professors Elvin C. Stakman, Ph.D., Jonas J. Christensen, Ph.D., Rodney B. Harvey, Ph.D.; Associate Professors Carl J. Eide, Ph.D., Helen Hart, Ph.D.; Assistant Professors Clyde M. Christensen, Ph.D., Louise Dosedall, Ph.D., Alvin H. Larson, B.S., Eric G. Sharvelle, Ph.D., Ian W. Tervet, Ph.D.; Instructors Raymond H. Landon, Ph.D., Matthew B. Moore, M.S.

PUBLICATIONS AND RURAL JOURNALISM

Associate Professors Harold L. Harris,* B.S.; Paul C. Johnson, B.A.

RHETORIC

Associate Professor Ralph G. Nichols, M.A.; Assistant Professor Marjorie H. Thurston, Ph.D.; Instructors James I. Brown, M.A., Francis E. Drake, M.A., William Randel, M.A., Donald Woods, M.A.

SOILS

Professor Clayton O. Rost, Ph.D.; Associate Professor Paul R. McMiller, M.S.; Assistant Professors Alfred C. Caldwell, Ph.D., John M. MacGregor, Ph.D.

VETERINARY MEDICINE

Professors Willard L. Boyd, D.V.S., Howard C. H. Kernkamp, D.V.M., M.S.; Assistant Professor Benjamin S. Pomeroy, D.V.M., Ph.D.

For faculty of departments in other colleges contributing required and elective courses, see the respective bulletins of those colleges.

* On leave.

GENERAL INFORMATION

For detailed information concerning the following see the General Information Bulletin of the University: admission, entrance requirements, advanced standing, adult special students, nonresident students, fees, expenses, financial aids, board and room, information for men and women with military service records.

Graduates of the schools of agriculture of the University of Minnesota who have completed the two summers of supervised work offered in the school course, one additional school year, and one additional summer's work, or the equivalent thereof, will be admitted to the College of Agriculture, Forestry, and Home Economics.

PRE-AGRICULTURE AND PRE-FORESTRY COURSES IN JUNIOR COLLEGES

Students from accredited junior colleges who have completed the general requirements described below will be admitted to the junior class in the agricultural and forestry courses. The amount of additional time required to complete the work for the degree of bachelor of science will depend (1) upon the quality and quantity of work which such students can do and (2) upon the special curriculum which they elect. Many of these curricula may be completed in two years by students who maintain at least the average quality and quantity of work. Additional work in summer sessions or regular quarters may be necessary in some of the special curricula. Since a large number of fields of specialization are open to students, and since these curricula vary so greatly in the subject-matter courses required, it is impossible to make any more specific statement. The requirements given below can be satisfied in the average junior college which offers a fundamental arts and science curriculum. Students in some junior colleges can select additional subjects which may be directly applicable and very helpful in the field of specialization to be followed later. Students who have not completely met the requirements will be given proportional credit.

1. A total of 90 quarter credits (1 semester credit = 1.5 quarter credits).

Required courses:

- (a) Botany 6 to 10 credits; general chemistry 8 to 12 credits; zoology 9 to 15 credits; rhetoric and English 9 to 15 credits; public speaking 3 credits.
- (b) At least two of the following: mathematics 5 to 15 credits; economics 8 to 15 credits; modern language 15 credits (in some curricula).

Electives: Sufficient to bring total credits to a minimum of 90.

The following is a general list of electives applicable in one or more of the specialization fields: sociology, psychology, economics, physics, history, advanced mathematics, technical business, agriculture and engineering subjects, advanced English, public speaking, mechanical drawing, freehand drawing, surveying, qualitative, quantitative, and organic chemistry, advanced courses in zoology and botany, bacteriology, modern language (especially French and German). These subjects are, of course, not equally applicable in all fields. For prospective forestry students, sociology, physics, mechanical drawing, higher algebra, trigonometry, and surveying are especially recommended.

Attention is called to the college requirement that all students must complete for graduation a total of not less than 18 credits (inclusive of courses required in the various curricula) in social science courses included in the following departments: Anthropology, Agricultural Economics, Economics, Geography, History, Philosophy, Political Science, Psychology, and Sociology.

See special requirements for each of the curricula in Agriculture or Forestry.

HOME ECONOMICS COURSES IN JUNIOR COLLEGES

In planning the work in the Junior College with the idea of transferring to one of the Home Economics curricula, the prospective transfer student should keep in mind that home economics, English, physical, biological and social science courses are required in the freshman and sophomore years.

The prospective student should familiarize herself with the course requirements of each specialization. In so far as the Junior College offers these courses they should be included in the first and second year program. Course requirements are given in detail for the curricula in Home Economics.

Credit may be allowed for such courses as listed above and for elective credits not listed.

REGISTRATION

In planning registration note particularly (a) prerequisites, (b) classes of students (fr., soph., jr., or sr.) to which courses are offered, (c) number of credits, (d) quarter or quarters offered, and be sure that provision is made in registration for the proper sequence of continuation courses.

Registration for courses as electives in other colleges of the University must be in conformity with regulations of the college offering the course.

Elective courses in the College of Science, Literature, and the Arts are separated into Junior College courses (numbered 1 to 49) open to freshmen and sophomores, and Senior College courses (numbered 50 to 99) open to juniors and seniors. In addition to satisfying other prerequisites a minimum of 90 credits and an honor point ratio of at least 1.0 must be earned before registering for a Senior College elective.

COLLEGE APTITUDE EXAMINATION

All new students are required to take a college aptitude examination in high school or on entrance as a part of the matriculation procedure. Admission, however, does not depend upon the results of the examination.

EXAMINATION IN ENGLISH COMPOSITION

All freshman students are required to take the placement test in English in high school or on entrance. Students with exceptionally high scores may be exempted from a part of the freshman year of rhetoric.

PLACEMENT TESTS

The college desires to bring about the best correlation possible between the technical courses in the fields of agriculture, forestry, and home economics, as taught in the schools of agriculture, in the high schools, and in other institutions. Where students have taken considerable work in these technical courses, it may be desirable for them not to be required to repeat a part or all of this work in the elementary courses in the college. The amount of work taken in the preparatory school and the quality of that work, and, finally, the question as to whether or not the subject-matter course has been used for entrance to the University, must be taken into consideration. In general, two possibilities for placement tests are offered:

1. For subjects not used for entrance to the University and in which the student has had adequate training, examinations may be taken for full credit in the elementary technical course in the college. These examinations may be taken during the first six weeks of residence without fee. After that time, a five-dollar fee is required.

2. For subjects which the student has used for entrance to the University, the student may, by satisfactory examination or by the presentation of other satisfactory evidence, be given permission to omit the elementary subject in the college course, substituting

therefor credits in other subjects and taking immediately the more advanced courses in this field.

FEES*

Cloquet Forest Experiment Station (Seniors in five-year Forestry curricula—spring quarter)	
Tuition: Residents of Minnesota	\$25.00
Nonresidents	56.00
Dormitory and dining hall fee	10.00
Health fee	1.00
Lake Itasca Forestry and Biological Station (Freshmen in five-year Forestry curricula—Summer Session)	
Tuition (prorated on basis of regular quarter tuition per quarter of 12 weeks):	
Residents of Minnesota	12.50
Nonresidents	28.00
Dormitory and dining hall fee	5.00
Health fee	1.00

FACULTY REGULATIONS

Students are held responsible for compliance with all faculty regulations. These regulations are published in a booklet issued to students at the time of registration.

GRADING SYSTEM AND HONOR POINTS

There are four passing grades, A, B, C, and D, of which A is highest and D lowest. In addition there are the following nonpassing grades: F (failure), and I (incomplete). For rules governing the nonpassing grades see the booklet, College Guide.

Honor points are awarded on the following basis: each credit hour with a grade of A counts three honor points; each credit hour with a grade of B counts two honor points; and each credit hour with a grade of C counts one honor point. A grade of D counts no honor points. To determine honor point ratio, count honor points and divide by total credits passed plus credits of unremoved and removed failure. Disregard grades of incomplete.

DEGREES OFFERED

This college offers two groups of curricula with corresponding degrees as follows:

- A. Four-year and five-year curricula leading to the degree of bachelor of science or other Bachelor's degree.
- B. Five-year curricula leading to the professional Master's degree in Agricultural Education, in Home Economics Education, and in Forestry, and to degree of Agricultural Technologist.

REQUIREMENTS FOR GRADUATION

A. Bachelor's degrees.

Candidates will be recommended for graduation after completion of the following requirements:

1. The prescribed curriculum including all the required amount and quality of work and the required amount of elective work to make the total number of credits given below.
2. One honor point per credit (i.e., the cumulative honor point average must be 1.0 or more). For additional quality requirements, see statements of prescribed curricula.
3. The English requirement for graduation (Rhetoric 51 or equivalent—see below).
4. A total of not less than 18 credits (inclusive of courses required in the various curricula) in social science courses included in the following departments—Agricultural Economics, Anthropology, Economics, Geography, History, Philosophy, Political Science, Psychology, and Sociology. (A minimum of 20 credits is required in order to receive approval for a vocational home economics teaching certificate.)

* Not listed in General Information Bulletin of the University.

The number of elective credits required for graduation will be decreased by one for each five honor points in excess of those required to reach an honor point ratio of 1.7.

Course of Study	Credit Requirement	Degree Conferred
Agricultural Business Administration	192	Bachelor of agricultural business administration
Agricultural Education	204	Bachelor of science
*Agricultural Engineering (Professional course)	207	Bachelor of agricultural engineering
*Agricultural Engineering Business Administration (five-year course)	254	Bachelor of agricultural engineering and bachelor of business administration
Agricultural Extension	192	Bachelor of science
*Agricultural Journalism	180	Bachelor of arts
Food Technology	192	Bachelor of science
Forestry	204	Bachelor of science
Home Economics	185	Bachelor of science
*Rural Education	183-185	Bachelor of science
Science Specialization	192	Bachelor of science
Technical Agriculture	192	Bachelor of science
Wildlife Management	192	Bachelor of science

* Combined curricula with other colleges to which the general requirements 3 and 4 and the last paragraph above do not apply.

ENGLISH REQUIREMENT FOR GRADUATION

Students upon entering the college are registered in Rhetoric 1 or 2 according to their tests in proficiency in English. Every student before graduation must demonstrate an acceptable proficiency in English composition. This is comparable or equivalent to the completion of Rhetoric 51. Unless the student is eligible to take the exemption examination provided by the Rhetoric Department, and succeeds in passing the examination satisfactorily, Rhetoric 51, three credits, must be completed in the junior or senior year.

SCHOLARSHIP AND CLASS REQUIREMENTS

1. Students must present for graduation at least one honor point for each credit; i.e., the cumulative honor point average must be 1.0 or more.

2. Freshman students with an honor point average of less than 0.25 obtained in two or three quarters of work in this college and sophomore students with an honor point average of less than 0.5 obtained in six quarters in this college or of five quarters if entering in the winter quarter, shall be dropped for one year unless continued by special permission of the Students' Work Committee.

3. Classified students who have completed 90 credits with an honor point average of less than 1.0 but more than 0.5 may be permitted to take additional courses to attain the required honor point ratio of 1.0 but shall not be permitted to register for junior-senior courses without the approval of the adviser and the Students' Work Committee.

4. A student who has completed 90 credits with an honor point ratio of at least 1.0 will be classified as a junior and will be admitted to candidacy for the Bachelor's degree from this college.

Students (except transfers with junior class standing) shall not be given classification in the junior class unless all required work of the freshman-sophomore years has been completed or postponement thereof covered by appropriate and approved petitions.

Degree with distinction—The degree of bachelor of science with distinction is granted to graduates of this college who have attained excellence in scholarship as evidenced by an average grade of two honor points per credit for the entire four-year curriculum. Transfer students with less than two years of work in this college shall not be eligible. Recommendations to the faculty for the degree with distinction shall be made

through the Students' Work Committee on the basis of scholarship and other evidence of satisfactory achievement and advancement in the course pursued.

Degree with high distinction—The degree of bachelor of science with high distinction is granted to graduates of this college who have attained special excellence in scholarship as evidenced by an average of two and one-half honor points per credit for the entire curriculum. The same conditions for residence and recommendation apply as for the degree with distinction.

B. Professional advanced degrees.

Course of Study	Four-year Credit Requirement (B.S. degree)	Five-year Credit Requirement	Degree Conferred
Agricultural Technology	192-204	45	Agricultural Technologist
Forestry	204	52	Master of forestry
Agricultural Education	204	45	Master of education
Home Economics Education	185	45	Master of education

COURSES IN THE GENERAL EXTENSION DIVISION

A student enrolled in the College of Agriculture, Forestry, and Home Economics may take courses in the General Extension Division with permission of the Students' Work Committee. Credits so received in General Extension classes or in Correspondence Study courses will be counted as credits towards graduation in this college. Credits and grades received will be transferred to the student's record in this college. See also statement in the General Information Bulletin of the University concerning the General Extension Division.

CREDIT IN THE GRADUATE SCHOOL

A student lacking not more than nine credits towards graduation may, upon petition, carry a limited amount of graduate work (approved courses numbered above 99) for graduate course credit. Courses taken for graduate credit will not carry credit toward the Bachelor's degree. No graduate credit will be given unless the student has made previous arrangements with the Graduate School.

With permission of the dean of the college, undergraduates lacking not more than six quarter credits may be permitted to register in the Graduate School.

BOARD AND ROOM

Sanford Hall—A dormitory for freshman girls is located near the Minneapolis campus. It accommodates 275 women and provides both single and double rooms. Reservations should be made well in advance. Applications should be sent to the director of Sanford Hall, University of Minnesota, Minneapolis 14, Minnesota.

Ada Comstock Hall—The University's newest dormitory for women is situated on the Minneapolis campus. It overlooks the Mississippi River near the Coffman Memorial Union. It houses 375 women, upper classmen only. Applications should be sent to the director of Comstock Hall, University of Minnesota, Minneapolis 14, Minnesota.

Cooperative Cottages—Thirteen co-operative cottages, each in charge of a counselor, offer comfortable homes for 140 women. In these units the student assists with the work of the house and thereby is able to reduce living expenses. Applications should be sent to the director of women's residences, Comstock Hall, University of Minnesota, Minneapolis 14, Minnesota.

Meredith Hall, University Farm—A dormitory residence, located on the Agricultural campus, is available for approximately 47 women students registered in the College of Agriculture, Forestry, and Home Economics. Applications for residence must be for the entire school year. The dormitory is closed during vacations.

The charge per quarter is \$36 for a single room and \$30 per student for a double room. The number of single rooms is limited. Necessary bedding is provided and the bed linen laundered. Girls should provide their own couch covers. Applications for rooms should be made early. A deposit of \$5 is made when the room is engaged.

All residents of Meredith Hall are required to take their meals at the Agricultural campus cafeteria, but with the provision that those students who must be on the Main campus at noon, by previous approval of the agricultural cafeteria manager, may be privileged to take certain noon luncheon meals in Comstock Hall.

Board and room will be paid for by the term, in advance. Inquiries regarding Meredith Hall should be addressed to J. O. Christianson, 205 Administration Building, University Farm, St. Paul 8, Minnesota.

Private houses—For information concerning approved boarding and rooming houses, address the Housing Bureau, 230 Northrop, University of Minnesota, Minneapolis 14, Minnesota.

AGRICULTURAL BOOKSTORE

The University operates the Agricultural Bookstore at University Farm for the convenience and accommodation of students and faculty of the College of Agriculture, Forestry, and Home Economics.

EXPLANATION OF TERMS AND COURSE NUMBERS

The quarters in which courses are offered are indicated by the letters f (fall), w (winter), s (spring), and su (summer) following the course number. For example: 5f,w,s indicates that Course 5 is given in the fall quarter and is repeated in the winter and again in the spring quarter; 5f-6w indicates a two-quarter course extending through the fall and winter quarters; and 5f,w-6w,s indicates that Course 5-6 is given in the fall and winter quarters and repeated through the winter and spring quarters.

All undergraduate courses are numbered from 1 through 99; 1 through 49 open to freshmen and sophomores; 50 through 99 open to juniors and seniors.

Numbers following the descriptive name of a course indicate the number of credit hours.

Course numbers in parentheses, following the number of credit hours, indicate prerequisite courses.

Descriptions of the courses listed in the following outline of the curricula, together with those of additional courses offered as electives, will be found on pages 70-114. The program of classes is printed in the Combined Class Schedule. The divisional statements are arranged alphabetically according to the names of the divisions.

One *credit hour* is equivalent to (1) one lecture or recitation period requiring two hours of preparation, (2) two periods of laboratory work requiring one hour of preparation, or (3) three periods of laboratory work with no preparation, each week for one quarter.

Honor points—See page 8 for definition.

A *major* is a series of courses equivalent to from 24 to 36 credit hours chosen from one of the elective groups.

A *minor* is a series of courses equivalent to 18 credit hours (12 credit hours in Science Specialization Curriculum) chosen from one of the elective groups.

A *required* course is a course required of all students for graduation irrespective of their major sequence.

A *limited elective* course is an elective which may not be chosen from the same group as the major or minor.

A *free elective* course may be chosen from any courses offered in the University for which the student has completed the prerequisites.

CURRICULA

Registration and continuance in certain of the curricula of this college are conditional upon maintenance of scholarship higher than the general average. This includes such curricula as Science Specialization, Food Technology, Wildlife Management, Pre-Veterinary Medicine, Wood Technology, and Agricultural Education. Initial registration in such curricula for students entering directly from the high school is therefore conditional upon the freshman orientation tests given to entering freshmen in Freshman Week or at other times during the year. However, students who are not permitted to register in these curricula at entrance upon the basis of these tests may later in the freshman year transfer to the desired curriculum if their scholastic achievement justifies such transfer.

Transfer students may, upon entrance, be registered in these special curricula, but continuance in these curricula is conditional upon the maintenance of the required scholastic average.

ALL-COLLEGE

FOUR-YEAR CURRICULA

(See pages 17-22)

I. Science Specialization—This curriculum provides for more intense specialization, particularly in the sciences basic to many fields of agriculture. Only that amount of technical training in practical agriculture is required which deals with the special science or field selected. Selection of the Science Specialization Curriculum should, in practically all cases, be followed by graduate study to at least the Master's degree. Students who do not have a high school record considerably above average should not attempt the Science Specialization Curriculum. For special scholarship requirements of this curriculum, see page 17.

II. Food Technology—This curriculum provides special training in preparation for industrial fields such as meat packing; processing, storage, and distribution of fruits, vegetables, and other perishables; canning and pickling. It includes also milk products and the products of milling and related industries. While this is a normal four-year curriculum certain scientific specialties may demand graduate work.

While the employment possibilities are probably chiefly in the various food industries, additional opportunities exist in research and in teaching in connection with various federal, state, and municipal government bureaus and offices as well as in colleges and in private research institutions.

III. Wildlife Management—The curriculum will be selected and built up with the aid of an adviser for the special vocational or professional objectives which the student has in mind. The work involves a wide range of activities including the management of upland game, big game, waterfowl, fish, and fur bearers in parks and forests, and on wildlife preserves and privately owned lands; it also includes the artificial propagation of game and fur species and the encouragement of non-game species. Students in this curriculum may prepare themselves for teaching in colleges and universities, for research and experimental work in various state and federal departments, and for management and extension work in state and federal departments concerned with utilization of our natural resources. (See also Game Management in Forestry Curriculum.)

AGRICULTURE

FOUR-YEAR CURRICULA

(See pages 23-37)

I. Technical Agriculture—This curriculum is arranged for students who plan to follow one or more of the technical or applied fields of agriculture immediately upon graduation. Students may, however, continue in graduate work for further specialization.

Training is offered for all types of farming in this area, for county agents and extension work, and for technical agricultural work in agricultural industries in dairy and animal husbandry, agronomy and plant industries, horticulture, agricultural engineering, landscape gardening, farm management, agricultural economics, and business.

For special training for teaching agriculture in high schools and for agricultural extension and county agent work, see Agricultural Education Curriculum and Agricultural Extension Curriculum.

For Pre-Theological "Major" in Agriculture accepted by the Conference on Cooperation between Colleges of Agriculture and Theological Seminaries for entrance to many theological seminaries in training for rural church work, see page 27.

For training in Rural Education, see page 35.

II. Agricultural Education—Designed especially for those who plan to teach agriculture in the public schools. This curriculum (given jointly with the College of Education) follows in general the technical agriculture groups and permits emphasis on special technical agriculture fields, such as dairying, horticulture, farm management, etc. In addition, it offers special training in education and leads to certificates for teaching agriculture and sciences in the schools of the state. A five-year curriculum is also offered and leads to a master of education degree at the end of a fifth year.

III. Agricultural Extension—Designed for training for agricultural county agents, extension specialists, boys' and girls' club leadership, and other specialties in agricultural extension. No single curriculum is prescribed because of the numerous variations which are possible and desirable. In general, the student is advised to select a curricular pattern in Technical Agriculture or in Agricultural Education. Around the selected pattern the student, with the help of his adviser, may build the curriculum best suited to his needs. A wide range of valuable subject matter is available in this and other colleges of the University. For a more complete discussion, see page 30.

IV. Agricultural Business Administration—Offered jointly with the School of Business Administration. Designed for those who wish to prepare for some branch of agricultural business, such as marketing, finance, farm real estate, merchandising, and so forth. More opportunity is offered for business and economic courses than in the Technical Agriculture Curricula, where greater stress is on the agricultural subjects. In the first two years students register in the College of Agriculture, Forestry, and Home Economics; in the last two years in this college and in the School of Business Administration. Students completing this curriculum will receive the degree of bachelor of agricultural business administration.

V. Agricultural Journalism—Offered jointly with the School of Journalism of the College of Science, Literature, and the Arts. Designed for those who wish to prepare especially for some field of journalism relating to agriculture. The student is offered general courses in technical agriculture, but the major part of the time is occupied with special preparation for technical journalism. Particular stress is also laid on economic and business courses, related to agriculture.

Students definitely interested in agricultural journalism should register in the School of Journalism of the College of Science, Literature, and the Arts, but should consult both the dean of the College of Agriculture, Forestry, and Home Economics and the director of the School of Journalism, College of Science, Literature, and the Arts.

VI. Agricultural Engineering (Professional)—Offered jointly with the Institute of Technology. This is a technical engineering course leading to the degree of bachelor of agricultural engineering. The first year is spent in work in the Institute of Technology and the last three years in work in both colleges. High school mathematical preparation required for all engineering curricula is also required here. The Agricultural Engineering (Professional) Curriculum is designed to train specialists in various types of engineering fundamental to agricultural practices and industries.

Students desiring a major in agricultural engineering with special reference to the technical application and without the professional engineering training should register for the Technical Agriculture Curriculum in the College of Agriculture, Forestry, and Home Economics.

VII. Rural Education—Offered jointly with the College of Education. Curriculum I-D, College of Education Bulletin. For university, college, and teachers college students who will spend the first two years largely or entirely in academic or pre-education junior college work and who wish to qualify for rural teaching and supervision. Students will register in the College of Education.

PRE-PROFESSIONAL CURRICULUM

I. Pre-Veterinary Medicine—At least one year of college training is required for admission to the various colleges of veterinary medicine. As a result of increase in registration it has become necessary for many such colleges to limit the enrolment in the freshman year.

The various fields open to graduate veterinarians include: (1) practice; (2) veterinarians and junior veterinarians in the United States Bureau of Animal Industry; (3) research and teaching positions in agricultural and veterinary colleges; (4) veterinarians in the United States Army; (5) positions with livestock sanitary boards and municipal health boards; and (6) commercial positions.

This curriculum of one year may vary in accordance with the veterinary college to be selected by the student. In general, the requirements follow the plan of the Science Specialization Curriculum, but special variations from this curriculum may be provided upon recommendation of the adviser.

FIVE-YEAR CURRICULA

I. Agricultural Technology—This curriculum, leading to the degree of Agricultural Technologist, is set up as a general formula to allow students in any of the fields of agriculture, such as animal or dairy husbandry, agricultural economics, agricultural extension, agronomy, and horticulture to plan special curricula to provide professional training in these special technical fields. While the degree will be considered equivalent to a Master's degree, it is a professional degree rather than a degree for work done towards a research career where the degree of master of science is given. The fifth year is also open to students graduating with the bachelor of science from an undergraduate basis of technical agriculture. Offered to those who plan to engage in occupations in the broad field of agricultural technology and who need an additional year of study (a) to extend their knowledge in their major field; (b) to obtain additional training in other general and special fields of agricultural technology; and (c) to obtain training in other fields such as social science, business, engineering, and the applied sciences.

II. Agricultural Education—A joint curriculum between the College of Education and the College of Agriculture, Forestry, and Home Economics. The master of education degree will be granted to students who satisfactorily complete a fifth year of work in Agricultural Education at the graduate level and who meet all of the regulations for the professional degree.

III. Agricultural Engineering Business Administration—Offered jointly with the Institute of Technology and the School of Business Administration. This is a five-year technical engineering and business curriculum with emphasis in the field of agriculture. The preliminary requirements are similar to those of the Professional Course in Agricultural Engineering. In addition to the required professional work in engineering a complete sequence of business courses is required together with a sequence of agricultural

courses. Students completing this curriculum will receive the degrees both of bachelor of agricultural engineering and bachelor of business administration.

Students interested in this course should consult the head of the Division of Agricultural Engineering, University Farm, St. Paul 8, Minnesota.

FORESTRY

(See pages 39-47)

Three professional and two technological curricula are offered in forestry.

FIVE-YEAR PROFESSIONAL CURRICULA

I. General Forestry—Preparation for technical work in forest management on municipal, state, federal, and private forests; for work in state and federal forest experiment stations; for work with soil conservation, extension, and farm forestry organizations.

II. Range Management—Preparation for technical work in public and private forest range management.

III. Game Management—Preparation for technical work in public and private forest and game management. (See also Wildlife Management Curriculum, page 20.)

These professional curricula are designed to meet the increasingly rigid requirements for the practice of professional work in the several technical fields of actual forestry. The wide range of information and training required in the fundamental biological and physical sciences, in social sciences, together with the increasing number of technical and professional courses in forestry call for not less than five years of college work. Keener competition in the future can be successfully met only by more adequate and better professional training.

FOUR-YEAR TECHNOLOGICAL CURRICULA

IV. Lumber Merchandising and Construction—Preparation for work in lumberyard management and in light building construction.

V. Wood Technology—Preparation for technical and research work in the pulp and paper and other wood-using industries and in wood preservation.

HOME ECONOMICS

(See pages 48-68)

FOUR-YEAR CURRICULA

I. General Home Economics—A four-year program of home economics and general education courses designed for those who do not wish to fit themselves for any specialized field in home economics but are interested chiefly in preparation for home-making.

II. Dietetics—For persons expecting to become hospital dietitians or nutritionists.

III. Home Economics Education—Offered jointly with the College of Education. For those who wish to teach home economics in the high schools and obtain a teacher's certificate. Students should have a high school record better than average. A high scholastic average is required for college work. A five-year curriculum is also offered and leads to a master of education degree at the end of the fifth year.

IV. Home Economics in Business—For students who wish to use their training in business where a knowledge of home economics is essential. Given with the cooperation of other colleges.

V. Institution Management—Preparation for management of such institutions as tearooms, cafeterias, dormitories, and institutional homes, etc.

VI. Home Economics and Nursery School Education—Offered jointly with the Institute of Child Welfare. Designed for those who have ability and interest in the two fields. Opportunities for placement are limited for those with only the Bachelor's degree.

VII. Home Economics Extension—Offered jointly with the College of Education. This curriculum is for students interested in preparation for home economics positions in the Agricultural Extension Service, such as home demonstration agent, 4-H Club agent, or homemaking specialist.

VIII. Preparation for Research in (a) Experimental Foods, (b) Nutrition, (c) Textiles and Clothing—An undergraduate preparation for graduate work as a basis for more intense specialization in fields of home economics research. For those who plan a scientific research career in home economics. Students who do not have a high school record or a college freshman record considerably above the average should not attempt this course. Graduate work to at least the Master's degree is assumed.

(See also All-College curricula, page 17 and Rural Education curriculum, page 35.)

FIVE-YEAR CURRICULUM

I. Home Economics Education—A joint curriculum between the College of Education and the College of Agriculture, Forestry, and Home Economics leading to the degree of master of education. A five-year program in Home Economics Education will be provided for those who wish to make additional preparation prior to their entrance into teaching and for those who wish to continue their professional work following the completion of the requirements for a Bachelor's degree. The five-year curriculum will qualify a person for high school teaching and for some college positions. The attainment of added training should facilitate professional promotion. For detailed statement, see the College of Education Bulletin.

ALL-COLLEGE CURRICULA

FOUR-YEAR CURRICULA

- I. Science Specialization
- II. Food Technology
- III. Wildlife Management

I. SCIENCE SPECIALIZATION

This curriculum is designed as a preparation for teaching in colleges and universities, for research and experimental work in experiment stations, for regulatory, experimental, and extension service in the state and federal departments of agriculture, forestry, and home economics, and in the industries related to these fields. For opportunities offered in the various fields the student is advised to consult with the various divisions and with the dean of the college.

Only those students who have a high school record considerably above the average and who are capable of maintaining a high scholarship record and who desire to delve deeply into specialized science fields should attempt to follow this curriculum. In general it is assumed that students who complete this undergraduate curriculum subsequently will spend one or more years in graduate study. Success in graduate study usually is predicated upon an undergraduate scholarship record which is distinctly above the average. In order to qualify for possible graduate fellowships or assistantships it is essential that the student on completing this curriculum should have maintained an honor point average approximating 2.0 or better.

The attention of the student is called to the modern language requirement for graduate students. In most divisions either German or French is required for the Master's degree. In all divisions *both* German and French are required for the degree of doctor of philosophy. Proficiency in at least one modern language (preferably German) should be acquired during the undergraduate years. Beginning German may be taken in either the 1-2-3 (15 credits) or 24a-25a-26a (12 credits) sequences.

The modern trend in the physical sciences is more and more toward a mathematical interpretation. Higher mathematics including calculus has proved a very potent scientific tool in many fields. Those students who plan to major in either biochemistry or forestry should ordinarily plan to secure more mathematics than is represented in the required list of subjects, and students specializing in these fields will also be expected to include a number of physics courses in their study program.

REQUIREMENTS

All-college requirements for students in this college. See page 8.

This curriculum requires 192 credit hours for graduation and is made up of (1) freshman-sophomore required courses with such options as are indicated in the freshman and sophomore years, and (2) a major, a minor, and electives in the junior and senior years in accord with the schedule given below.

In the freshman and sophomore years a grade of C must be earned in Mathematics 1, 6, 7, Chemistry 1-2, 3 (or 4-5, 11), Zoology 1-2-3 (or 14-15 and 3 additional credits of zoology or physiology or economic entomology and zoology), in Botany 1-2-3 (or 4-5), Bacteriology 53, Agricultural Biochemistry 4, 5 (or 6).

In the junior and senior years the major and minor sequence must be completed with an average honor point ratio of 1.5.

Special attention of every student is called to the faculty requirements for classification in the junior class, page 9.

FRESHMAN YEAR

General courses—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.

- Bot. 1f-2w-3s,† General Botany, 10, or Bot. 4w-5s, General Botany, 10
 Inorg. Chem. 1f-2w, General Inorganic Chemistry, 8; and Inorg. Chem. 3s, Semimicro Qualitative Analysis, 4. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 4-5 and 11
 Inorg. Chem. 4f-5w, General Inorganic Chemistry, 8; and Inorg. Chem. 11f,s, Semimicro Qualitative Analysis, 4. Those required to take Inorg. Chem. 1-2 and 3 may omit this course
 Math. 1f,w,s,*‡ Higher Algebra, 5; Math. 6f,w,s, Trigonometry, 5 (Math. 1 or equiv.); and Math. 7f,w,s, College Algebra, 5 (Math. 6)
 Modern language,§†† 15 cred. or special sequence of 12
 Orient. 1f,w,s, College Orientation Lectures, 1
 P.H. 3f,w,s,¶ Personal Health, 2
 Rhetoric 1f,w,s-2w,s,f-3s,f,w, Rhetoric, 9
 Zoology 1f-2w-3s,† General Zoology, 10 or Zool. 14f-15w, General Zoology, 6; and 3 additional credits of zoology or physiology or economic entomology and zoology. Ent. 5f,w,s, 5 cred., suggested.

SOPHOMORE YEAR

General courses—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.

- Agr. Biochem. 4f,s, Introduction to Organic and Biochemistry, 5 (Inorg. Chem. 8 cred.)
 Agr. Biochem. 5s, Plant Biochemistry, 5 (Agr. Biochem. 4, Soils 4); or Agr. Biochem. 6f, Animal Biochemistry, 5 (Agr. Biochem. 4, Soils 4 advised)
 Agr. Econ. 1f, Principles of Economics I, 3
 Agr. Econ. 2w, Principles of Economics II, 5 (Agr. Econ. 1)
 Bact. 53f,w,s, General Bacteriology, 5 (chem., bot. or zool.)
 Bot. 1f-2w-3s,† General Botany, 10, or Bot. 4w-5s, General Botany, 10
 Math. 1f,w,s,* Higher Algebra, 5; Math. 6f,w,s, Trigonometry, 5, (Math. 1 or equiv.); Math. 7f,w,s, College Algebra 5 (Math. 6) if not taken in freshman year
 Modern language, 15 cred. or special sequence of 12, if not taken in the freshman year
 Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)
 Soils 4w, Soils 3, (Chem. 1-2 or 4-5)
 Zoology 1f-2w-3s,† General Zoology, 10 or Zool. 14f-15w, General Zoology, 6; and 3 additional credits of zoology or physiology or economic entomology and zoology. Ent. 5f,w,s, 5 cred., suggested.

JUNIOR AND SENIOR YEARS

1. Rhet. 51f,w,s, Exposition, 3 (Rhet. 3)
2. A major sequence of 24 to 36 credits in one of the following fields or divisions:

1. Agricultural Biochemistry	8. Forestry
2. Agricultural Economics	9. Home Economics
3. Agronomy and Plant Genetics	10. Horticulture
4. Animal Husbandry	11. Plant Pathology
5. Animal Nutrition	12. Poultry Husbandry
6. Dairy Husbandry	13. Soils
7. Entomology and Economic Zoology	14. Veterinary Medicine
3. A minor sequence of 12 credits to be chosen in some division (see major), department, or field of work outside of the major.

* Students will be exempt from the required mathematics courses only in accordance with the placement tests given by the Department of Mathematics (see page 101). For any exemption the student will be required to substitute an equivalent number of credits (mathematics or elective) as approved by his adviser.

† One of these two, botany or zoology, must be taken in the freshman year and the other in the sophomore year.

‡ One of these two, mathematics or modern language, must be taken in the freshman year and the other in the sophomore year.

¶ Three credits of physical education are required for women in this curriculum. Not required of students with military service records.

†† In general, "modern language" will be interpreted to mean either German or French unless some other language is recommended by the student's major adviser.

Subject-matter courses from one division or from departments of other colleges of the University may be applied as major or minor credits in another division if they are clearly related or fundamental to the field of the major or minor specialization.

4. Electives sufficient to make a total of 192 credit hours for the four years of work.

II. FOOD TECHNOLOGY

This curriculum provides training in preparation for industrial fields such as meat packing; processing, storage, and distribution of fruits, vegetables, and other perishables; canning and pickling. It includes also milk products and the products of milling and related industries. Concentration in these fields may involve major subject-matter specialties in chemistry, bacteriology, and other special biological fields. Students intending to enter the Food Technology Curriculum should have a fairly definite professional or vocational program and must consult the special faculty advisory committee for this curriculum (see office of the dean of the college), with whose approval a program of subject-matter courses may be selected under the limits described. The curriculum presented is intended merely to show the wide range of available subject-matter courses, especially those basic to the whole field, from which the student must select those best suited for his particular program. While this is a normal four-year curriculum certain scientific specialties may demand graduate work.

While the employment possibilities are probably chiefly in the various food industries, additional opportunities exist in research and in teaching in connection with various federal, state, and municipal government bureaus and offices as well as in colleges and in private research institutions.

REQUIREMENTS

All-college requirements for students in this college. See page 8.

In the freshman and sophomore required courses, a grade of C or better must be earned in Mathematics 1, 6, 7, Chemistry 1-2, 3 (or 4-5, 11), Zoology 1-2-3 (or 14-15 and 3 additional credits of zoology or physiology or economic entomology and zoology), Botany 1-2-3 (or 4-5), Bacteriology 53, and Agricultural Biochemistry 2, 4, and 5 (or 6).

The major sequence of courses must be completed with an average honor point ratio of not less than 1.5, and the minor sequence, or courses offered in lieu of the minor, must be completed with an average honor point ratio of not less than 1.0.

The Food Technology Curriculum requires 192 credit hours for graduation and is made up of the following:

1. **Freshman-sophomore required courses**—The same as for the Science Specialization Curriculum, except that Quantitative Methods (Agr. Biochem. 2) is substituted for Soils 4.
2. **Junior-senior years**—
 - a. Rhet. 51f,w,s, Exposition 3.
 - b. Major sequence of 24 to 36 credits in one of the following fields: Agricultural Biochemistry, Animal Husbandry, Animal Industry, Animal Nutrition, Dairy Husbandry, Foods and Nutrition or Plant Industry.
Subject-matter courses from one division or from departments of other colleges of the University may be applied as major credits in another division if they are clearly related or fundamental to the field of the major specialization.
 - c. In lieu of a minor, courses totaling at least 30 credits to be selected from the following fields: Microbiology, Chemistry, Physics. (See courses marked with an asterisk (*) in list of courses below.)
 - d. Electives sufficient to make a total of 192 credit hours. May be selected from list below or from other courses and departments.

SUGGESTED COURSES FOR FOOD TECHNOLOGY

Available for major or minor sequence and electives. Courses marked with an asterisk (*) are suggested for minor requirements (2c above).

College of Agriculture, Forestry, and Home Economics

- Agricultural Biochemistry:** 101-102, Agricultural Quantitative Analysis*; 103, Dairy Chemistry; 108, Chemistry of Wheat and Wheat Products; 110, Flour Laboratory Methods; 113-114-115, Biochemical Laboratory Methods; 116, Advanced Animal Nutrition; 118, Laboratory Problems in Biochemistry*; 119, Colloids*; 120, Proteins*; 121, Carbohydrates*; 122, Lipids and Fats*; 123, Enzymes.*
- Agricultural Economics:** 25, Principles of Accounting; 40, Principles of Marketing Organization; 90, Agricultural Statistics; 141, 142, 143, Marketing Organization.
- Agricultural Engineering:** 23, General Physics or 24-25, Agricultural Physics; 70, Dairy Engineering.
- Agronomy and Plant Genetics:** 31, Principles of Genetics; 21, Grain Crops; 22, Grain and Hay Grading.
- Animal Husbandry:** 51, Meat Selection; 52, Meats; 53, Advanced Meats; 54, Utilization of Meats; 107, Meat Problems.
- Dairy Husbandry:** 2, Dairy Bacteriology*; 110-111-112, Dairy Products; 113, Technical Control; 114, Milk By-Products; 115, Advanced Dairy Bacteriology.*
- Entomology and Economic Zoology:** 5, Economic Entomology; 51, Introductory Parasitology*; 175, Insecticides.
- Home Economics:** 31, Introduction to Nutrition; 40, Food Preparation; 41, Food Management and Marketing; 45, Quantity Cookery; 64, Institution Buying; 142, Experimental Cookery; 146, Special Food Problems; 170, Nutrition of the Family.
- Horticulture:** 137, Vegetable Crops.
- Plant Pathology:** 1, Plant Pathology; 105-106-107, Mycology*; 160, Plant Histochemistry; 161, Technology of Fruits and Vegetables (may include refrigeration).
- Poultry Husbandry:** 53, Poultry Feeding; 54, Poultry Products.

Other Colleges

- Bacteriology:** 104, Sanitary Bacteriology*; 114, Molds, Yeasts, and Actinomycetes*; 121-122, Physiology of Bacteria*; 123, Applied Bacteriology.*
- Botany:** 118, 119, 120, Cytology*; 123, 127 Histology.
- Chemistry:** Analytical Chemistry 1-2 or 7, Quantitative Analysis*; 104, Microchemistry*; 140, Water Analysis. Inorganic Chemistry 11 or 12-13, Semimicro Qualitative Analysis*; 117, Glass Blowing. Organic Chemistry 1-2 or 54, 55, 156, Elementary Organic Chemistry*; 142-143, The Chemistry of Natural Products.* Physical Chemistry 107, Elementary Physical Chemistry.*
- Chemical Engineering:** 80, Chemical Engineering Materials*; 101, 102, 103, Unit Operations*; 105, Fuels and Combustion*; 140, Sanitary Chemistry.*
- Civil Engineering:** 165, Public Health Engineering; 167, Industrial Hygiene Engineering.
- Economics:** 3, Elements of Money and Banking; 20, Elements of Accounting; 28, Business Law; 161, Labor Problems and Trade Unionism.
- Mathematics:** 30, Analytic Geometry; 50, 51, 105, Calculus.
- Mechanical Engineering:** 166, Refrigeration.
- Physics:** 1-2-3, Introduction to Physical Science.*
- Physiology:** 4, Human Physiology; 100, 101, Physiological Chemistry.*
- Political Science:** 1-2, American Government and Politics.
- Psychology:** 1-2, General Psychology.
- Public Health:** 53, Elements of Preventive Medicine and Public Health; 102, Environmental Sanitation I; 110, Biometric Principles; 111, Biostatistics Laboratory.
- Zoology:** 21, Histology.*

III. WILDLIFE MANAGEMENT

(See also Game Management in Forestry Curricula, page 43)

Wildlife management has developed into an established profession, and there is a steady demand for college training in this field. The work involves a wide range of activities including the management of upland game, big game, waterfowl, fish, and fur bearers in parks and forests, and on wildlife preserves and privately owned lands; it also includes the artificial propagation of game and fur species and the encouragement of non-game species. Within the colleges of the University many courses are available which contribute valuable information and basic principles of use to students in this field. Students desiring such specialization are advised to follow the requirements of the Wildlife Management Curriculum from the beginning of the freshman year with such substitutions as advisers may designate.

The Minnesota Agricultural Experiment Station is using every available opportunity to develop research, to collect information, and to encourage the development of this new land-use industry. The following curriculum is designed to provide the student with a background of biology and farm and forest economics as well as training in the more practical phases of wildlife management. Since the specialization may vary considerably even in one field with the individual student, complete curricula are not suggested in all lines. The intention is not to offer a completely detailed curriculum to which the student must rigidly adhere. It is expected that each student will build his course by the major elective method under the guidance of an adviser and for the special vocational purpose he may have in mind. Such curricula will, in general, fall in one of the following groups: forestry, agriculture, agricultural and forestry sciences.

Students in this curriculum may prepare themselves for teaching in colleges and universities, for research and experimental work in various state and federal departments, and for management and extension work in state and federal departments concerned with utilization of our natural resources.

Wildlife management has important relations to the following government and private enterprises: United States, and state forest services, national and state park services, soil conservation programs, United States Fish and Wildlife Service, research and teaching, and commercial wildlife management. For the opportunities offered, the student is advised to consult the Division of Entomology and Economic Zoology and other divisions or departments specially concerned and the dean of the college.

REQUIREMENTS

All-college requirements for students in this college. See page 8.

This curriculum requires 192 credit hours for graduation and is made up of (1) freshman-sophomore required courses with such options as are indicated in the freshman and sophomore years, and (2) a major and electives in the junior and senior years in accord with the schedule given below.

Special attention of every student is called to the faculty requirements for classification in the junior class, page 9, and to the English requirement for graduation, page 9.

All students, irrespective of the special curriculum which they may select, are required to complete certain general courses before graduation. These are considered fundamental and necessary to any curriculum. For some students the outline for the first two years, given below, represents more than the regular amount of work of 17 credit hours per quarter. In such cases those subjects which cannot be taken in the freshman and sophomore years must take precedence in the following year.

RECOMMENDATIONS

General Zoology should be completed during the freshman year. Not less than 9 credits will be accepted as fulfilling the general zoology requirement.

At least one modern language should be obtained during the undergraduate work. German is recommended and may be taken in one of the two following sequences: 1-2-3 (15 cred.) or 24a-25a-26a (12 cred.)

FRESHMAN YEAR

General courses—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed.

Agr. Eng. 3f, Mechanical Drawing, 3

Bot. 1f-2w, General Botany, 6

Inorg. Chem. 1f-2w, General Inorganic Chemistry, 8. Students presenting a year of high school chemistry may elect instead Inorg. Chem. 4-5.

Inorg. Chem. 4f-5w, General Inorganic Chemistry, 8 (one yr. of high school chem.). Those required to take Inorg. Chem. 1-2 may omit this course.

Math. 1f,w,s,* Higher Algebra, 5
 Math. 6f,w,s,* Trigonometry, 5 (Math. 1 or equiv.)
 Orient. 1f,w,s, College Orientation Lectures, 1
 P.H. 3f,w,s,† Personal Health, 2
 Rhet. 1f,w,s,-2w,s,f-3s,f,w, Rhetoric, 9
 Zool. 1f-2w-3s, General Zoology, 10

SOPHOMORE YEAR

1. Freshman courses which were not completed during the freshman year.
2. General courses
 - Agr. Biochem. 4f, Introduction to Organic and Biochemistry, 5 (Inorg. Chem. 8 cred.)
 - Agr. Econ. 1f, Principles of Economics I, 3
 - Agr. Econ. 2w, Principles of Economics II, 5. (Agr. Econ. 1)
 - Agr. Eng. 19f,s, Elementary Surveying, 3 (3, 11 or Trig.)
 - Bot. 50f, General Plant Ecology (Bot. 1-2-3)
 - Bot. 52s, Elementary Taxonomy (Bot. 1-2-3)
 - Geol. 8f,w,s, Introductory Geology, 5
 - Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)
 - Rhet. 51f,w,s, Exposition, 3 (Rhet. 3)
 - Soils 4w, Soils, 3 (Inorg. Chem. 1-2 or 4-5)
 - Zool. 22w, Comparative Anatomy, 5 (Gen. Zool.)
3. Biological Station at Itasca State Park (Summer Session). The second term of the Summer Session (Biological Station) should be attended after either the sophomore or junior year. The course there should include Bot. 116su, Advanced Field Taxonomy, and electives selected according to the individual needs of the student. The first term of the Summer Session (Forestry Station) is also recommended but not required. (See page 40, Forestry Curricula, for courses.)

JUNIOR YEAR

1. Sophomore courses which were not completed during the sophomore year.
2. General courses
 - Agr. Econ. 90f, Agricultural Statistics, 5
 - Bact. 53f,w,s, General Bacteriology, 5 (Inorg. Chem. and Gen. Zool.)
 - For. 126f, Silvics 3
 - For. 131w, Forest Policy and Administration, 5 or Ent. 62, Wildlife Conservation Principles and Administration, 3 (given at Itasca Park)
 - Pl. Path. 4f, Grasses and Sedges, 3 (9 cred. in botany or equivalent)
 - Pl. Path. 3s, Weeds, 3 (6 cred. in botany)
3. Students may elect the spring quarter of the junior year at the Cloquet Forest Experiment Station (see page 42, Forestry Curricula, for courses) upon consultation with adviser. For such students Soils 4 will not be required.

JUNIOR AND SENIOR YEARS

1. German, 15 or special sequence of 12
2. A major sequence of 30 to 36 credits which must include the following courses:
 - Ent. and Econ. Zool. 64w, Economic Vertebrate Zoology 3 (Gen. Zool. 1-2-3)
 - Ent. and Econ. Zool. 165w, Wildlife Management 3 (Gen. Zool. 1-2-3, plus 10 cred. in Zool, or forestry)
 - Zool. 51f, Introductory Animal Parasitology, 5 (Gen. Zool. 1-2-3)
 - Zool. 53s, Faunistic Zoology, 5 (Gen. Zool. 1-2-3)
3. Electives applicable to the major or selected with a view of forming a minor field may be chosen from the following departments or divisions:

1. Agricultural Biochemistry	8. Geology
2. Agricultural Economics	9. Horticulture
3. Animal Nutrition	10. Plant Pathology and Botany
4. Bacteriology	11. Poultry Husbandry
5. Botany	12. Soils
6. Farm Management	13. Veterinary Medicine
7. Forestry	14. Zoology

* Students will be exempted from the required mathematics courses only in accordance with the placement tests given by the Department of Mathematics (see page 101). For any exemption the student will be required to substitute an equivalent number of credits (mathematics or electives) as approved by his adviser.

† Not required of students with military service records. Three credits of physical education are required for women in this curriculum.

CURRICULA IN AGRICULTURE

FOUR-YEAR CURRICULA

- I. Technical Agriculture, page 23.
- II. Agricultural Education, page 27.
- III. Agricultural Extension, page 30.
- IV. Agricultural Business Administration, page 31.
- V. Agricultural Journalism, page 32.
- VI. Agricultural Engineering (Professional), page 34.
- VII. Rural Education, page 35.

PRE-PROFESSIONAL CURRICULUM

- I. Pre-Veterinary Medicine, page 37.

FIVE-YEAR CURRICULA

- I. Agricultural Technology, page 37.
- II. Agricultural Education, page 37.
- III. Agricultural Engineering Business Administration, page 38.

FOUR-YEAR CURRICULA

I. TECHNICAL AGRICULTURE

The possibilities in this group are numerous and varied. Each student in this group arranges his curriculum with the aid of his adviser and in conformity with regulations given below to fit his vocational objective. Specialization begins normally in the junior year but may also extend into the sophomore year. Every subject-matter division of the college (see pages 70-114) offers one or more vocational or professional fields of specialization. Some divisions offer a fairly large number of such fields. Freshman and sophomore students should therefore consult carefully with the staff of the division in which they plan to major.

The vocational opportunities are too varied to permit complete enumeration. In general, technical agriculture includes all those vocations in which a technical knowledge of at least some fields of agriculture is required and put to immediate and practical use. Where more intense specialization is desired through graduate study or in highly specialized fields, the other curricula in agriculture (pages 17-22) should be considered and discussed with major divisions concerned.

The Technical Agriculture Curriculum offers training for: general farming and many kinds of specialized farming; industrial and commercial enterprises dealing with agricultural products such as creamery, meat packing, milling, canning, feed products, seeds and plant nursery, and many others; industrial and commercial companies dealing with products sold chiefly to farms such as agricultural machinery, dairy and creamery supplies, feeds, etc.; business concerns that deal in many ways largely with rural people such as co-operatives, banks, insurance companies, marketing organizations, railroads, etc.; a great variety of federal, state, and other governmental agencies and bureaus such as soil conservation, agricultural adjustment, inspection services of many kinds, etc.; and, finally, a considerable variety of special technical jobs such as park and golf course supervision, technicians in manufacture and distribution of farm products, control of insect and plant pests, seed production and improvement, etc. For training for teaching agriculture in high schools, see Agricultural Education, page 27. For preparation for rural church work, see Pre-Theological Major (page 27) which is now accepted for admission to a large number of theological seminaries. For training in Rural Education, see page 35.

Every prospective student in this curriculum is urged to obtain, before entering col-

lege, at least six months' practical experience on a farm. Entering students whose farm experience credentials are not satisfactory will be examined as to their familiarity with farm practices, and farm experience will be required during the college course in accordance with the results of these examinations. For students who major in dairy husbandry, at least three of the six months of approved farm experience must be on an accredited dairy farm or in a well-organized dairy manufacturing plant.

REQUIREMENTS

All-college requirements for students in this college. See page 8.

These curricula require 192 credit hours for graduation, including:

- A. Freshman-sophomore years—Required of all students registered in Technical Agriculture, pages 24-25. See also required courses in the junior year.
- B. Junior-senior years—see pages 25-26.

Special attention of every student is called to faculty regulations for classification in the junior class, page 9.

A. FRESHMAN-SOPHOMORE YEARS—REQUIRED COURSES

These courses are required of every student before graduation. They constitute approximately half of the curriculum and are considered fundamental and necessary to any training in technical agriculture. Every student must complete these courses, if possible, before the end of the sophomore year. Modifications in the requirements may be permitted upon approval by the Students' Work Committee where students have a very definite objective in their college curriculum in which substitutions for certain of the listed freshman and sophomore required courses may profitably be made. Approval of the adviser by special letter must be presented with the petitions to the Students' Work Committee.

For some students the outline of the first two years, given below, represents more than the regular amount of work of 16 credit hours per quarter. In such cases those subjects which cannot be taken in the freshman and sophomore years must take precedence the following year. Nine credits in English are also required in the junior year. Phys. Ed. 1-2-3, Physical Education, 3 credits, and Military Science and Tactics or Naval Science and Tactics may be taken in addition to the regular schedule if desired. Care should be taken in registration to give precedence to courses offered only one quarter.

Freshman Year

General courses—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and the prerequisites must be observed

- Agron. 1f,s,* General Farm Crops, 3
- An. Husb. 1f,w,s,*† Livestock Production, 4
- Bot. 1f-2w, General Botany, 6
- Dy. Husb. 1f,s,*† Elements of Dairying, 3
- Hort. 1w,* General Horticulture, 3, or Hort. 6f, Fruit Growing, 3, or Hort. 32s, Vegetable Growing, 3 (Hort. 6 required of Agricultural Education students)
- Inorg. Chem. 1f-2w, General Inorganic Chemistry, 8. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 4-5.
- Inorg. Chem. 4f-5w, General Inorganic Chemistry, 8 (one yr. of high school chem.). Those required to take Inorg. Chem. 1-2 may omit this course.
- Math. 1f,w,s,§ Higher Algebra, 5 cred., or Agr. Eng. 11w, Applied Mathematics, 5**

* Graduates of the university schools of agriculture or students presenting high school work in any of these courses may, upon approval of their adviser and the head of the division in which the course is taught, substitute elective courses.

† Students who expect to major in a special horticultural field may substitute for these courses 6 credits approved by the chief of the Division of Horticulture.

§ Students will be exempt from Math. 1 who pass an exemption test given by the Department of Mathematics requiring the equivalent of Math. 1, Higher Algebra. For any exemption the student will be required to substitute an equivalent number of credits (mathematics or electives) as approved by his advisers. (See page 101.)

** Credit permitted for only one of these courses.

Orient. 1f,w,s, College Orientation Lectures, 1
 P.H. 3f,w,s,¶ Personal Health, 2
 Rhet. 1f,w,s, Rhetoric I, 3
 Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)
 Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)

Sophomore Year

1. Freshman courses which were not completed during the freshman year.
2. **General courses**—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.
 - Agr. Biochem. 4f, Introduction to Organic and Biochemistry, 5 (Inorg. Chem. 8 cred.)
 - Agr. Biochem. 5s, Plant Biochemistry, 5 (Agr. Biochem. 4, Soils 4); or Agr. Biochem. 6f, Animal Biochemistry, 5 (Agr. Biochem. 4, Soils 4)
 - Agr. Econ. 1f, Principles of Economics I, 3
 - Agr. Econ. 2w, Principles of Economics II, 5 (Agr. Econ. 1)
 - Agr. Eng. 3 credits selected from the following: 3s, Mechanical Drawing, 3; 12s, Agricultural Machinery, 3; 13f, Gas Engines and Tractors, 3; 31w,s, Principles of Drainage, 3; 37w,s, Rural Sanitation and Water Supply, 3. One or more of these courses are required in the junior and senior years of several of the outlined curricula. If completed in meeting this requirement some other of the above courses must be substituted in the junior or senior year.
 - Agr. Eng. 23w,* General Physics, 5. Those presenting a year of high school physics may omit this course and substitute 5 credits elective later in their curriculum.
 - Bact. 53f,w,s, General Bacteriology, 5 (chem., zool.)
 - Ent. 5f,w,s, Economic Entomology, 5 (Zool. 14-15 or equiv.)
 - For. 10w, Farm Forestry, 3
 - Soils 4w, Soils, 3 (Inorg. Chem. 1-2 or 4-5)
 - Zool. 14f-15w, General Zoology, 6

B. JUNIOR-SENIOR YEARS

Required Courses

The following courses should be taken in the junior year if not taken previously:

- Rhet. 24s, Advanced Public Speaking, 3 (Rhet. 22) or Rhet. 31f,s, Survey of English Literature I, 5 (Rhet. 3) or Rhet. 32f, Survey of English Literature II, 3 (Rhet. 3) or Rhet. 60w,s, Contemporary Literature, 3 (Rhet. 3) or Rhet. 33w,s, American Life in American Literature, 3 (Rhet. 3) or Rhet. 12f,w, Debate and Discussion, 3 (Rhet. 3, 22 recommended)
- Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)
- Rhet. 51f,w,s, Exposition, 3 (Rhet. 3). Cannot be taken earlier than junior year

Elective Courses

Every student is required to file in the office of admissions and records by the end of his sophomore year a statement of the major, minor, and limited electives, approved by his adviser, which he plans to take during his junior and senior years. Such statements from each student will make it possible to provide a workable program of subject courses. Students will not be given classification in the junior class until their specialization card is filed in the office of admissions and records. A change from one curriculum to another after the close of the sophomore year is permitted only on approval and does not exempt the student from any of the requirements of the curriculum which he finally selects. Such changes usually involve inconvenience and sometime loss of credit to the student. Special attention of the student is called to the faculty requirements for classification in the junior class. (See page 9). All students are invited to consult with the dean of the college concerning the selection of curricula.

The student, with the approval of his adviser, may select any curriculum which complies with the following requirements:

1. A major of from 24 to 36 credit hours, to be selected from one of the main groups or subgroups listed below.

* Not open for credit to students offering one unit of high school physics for entrance.

¶ Not required of students with military service records. Three credits of physical education are required for women in this curriculum.

2. A minor of 18 credit hours, to be selected from a different main group from that of his major or in a related department in some other college of the University. A student may select a second minor to be made up of credits listed in limited electives and free electives. Such a minor will be clearly outside of the field of the major and the first minor and must be approved by the division of the second minor as to sequence of courses.

Subject-matter courses from any group or subgroup or from departments of other colleges of the University may be applied as major or minor credits in any group or subgroup if they are clearly related or fundamental to the group or subgroup of the major or minor specialization.

3. Limited electives, 18 credit hours, which must be selected outside of the groups from which the major and minor have been chosen, in order to broaden the educational base.
4. A total of not less than 18 credits in social science courses. (See page 8.)
5. Free electives sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University and approved by the adviser.

Elective Groups and Subgroups

	Page		Page
Agricultural Biochemistry*	70	Dairy Husbandry	85
Agricultural Economics (See also Agricultural Business Administration, p. 31)	71	a. Dairy Production	
Agricultural Education (Minor only, on approval of Department of Agricultural Education. See special curriculum.)	73	b. Dairy Products	
Agricultural Engineering. (See also Professional Curriculum, page 34.)	74	Entomology and Economic Zoology	87
Agronomy and Plant Genetics	77	a. Entomology*	
a. Agronomy		b. Wildlife Management (for minor only. See special curriculum, page 20.)	
b. Plant Genetics*		Forestry. (For minor only. See Forestry Curricula, page 39)	89
Animal and Poultry Husbandry	79	Horticulture	98
a. Animal Husbandry		a. General Horticulture	
b. Poultry Husbandry		b. Landscape Gardening	
		Plant Pathology and Botany*	106
		Soils	112
		Veterinary Medicine. (For minor only. See Pre-Veterinary Medicine Curriculum, page 37)	113

Special Majors and Minors

Agricultural Journalism (minor). See page 32. The minor program must have the approval of the School of Journalism in the College of Science, Literature, and the Arts.

Animal Industry (major or minor)—Requirements as above except that courses may be selected from any of the following divisions: Animal and Poultry Husbandry, Dairy Husbandry, Veterinary Medicine, Agricultural Biochemistry, Economic Zoology.

Plant Industry (major or minor)—Requirements as above except that courses may be selected from any of the following divisions: Agronomy, Horticulture, Plant Pathology, Entomology, Soils, Agricultural Biochemistry.

* As a major in Technical Agriculture approval of division is required. A major in this group will usually be selected under the Science Specialization Curriculum, page 17.

In addition, the student must fulfill the minimum requirements of the college of agriculture which include English Composition and Science (usually botany and chemistry).

Rural Social Science (major)—Requirements as above except:

Freshman-sophomore years

With approval of adviser, certain General College courses in the basic sciences may be substituted for those listed, and elementary courses in sociology and rural sociology may be begun in the sophomore year.

Junior-senior years

Major: 36 credits in rural social science, to be distributed as follows: Agricultural Economics, 18 credits; Rural Sociology and Sociology, 18 credits.

Minor: 18 credits in one of the following technical agriculture divisions or groups: Agricultural Engineering, Agronomy, Animal and Poultry Husbandry, Dairy Husbandry, Horticulture, Soils, Animal Industry, Plant Industry.

Pre-Theological "Major" in Agriculture—This major, as defined by the Conference on Co-operation Between Colleges of Agriculture and Theological Seminaries, requires, in addition to the college requirements for graduation in Technical Agriculture, the following:

At least one basic course in each of the following fields: Agricultural Economics, Economics, English Literature, History and Government, Philosophy, Public Speaking, Psychology, Rural Sociology, Sociology.

These subjects may be scheduled by any student with a normal major in Technical Agriculture under minor or limited or free electives. Most of these subjects will also count toward the college social science requirement for graduation. Any student who desires to enroll in this "major" should consult the office of the dean of the college and should plan carefully with his adviser his entire curriculum in order to meet the college and pre-theological "major" requirements involved.

II. AGRICULTURAL EDUCATION

Students who have completed the required work of the freshman and sophomore years of the Agricultural Education Curriculum of the College of Agriculture, Forestry, and Home Economics, or equivalent, from other agricultural curricula, may prepare to teach agriculture in the public schools by completing the junior and senior years in a combined curriculum of the College of Education and the College of Agriculture, Forestry, and Home Economics leading to the degree of bachelor of science. (By completing a fifth year in the combined five-year curriculum with the College of Education, they may receive the degree of master of education. See page 37.)

For all-college requirements for students in this college, see page 8. This curriculum requires 204 credit hours for graduation including a distribution of minimum credits as follows:

REQUIREMENTS

Subject	Credits	Subject	Credits
Agricultural Biochemistry	5	Entomology	5
Agricultural Economics	17	Horticulture	6
Agricultural Education	26	Mathematics	5
Agricultural Engineering	18	Orientation	1
Agronomy	15	Plant Pathology	8
Animal and Poultry Husbandry	19	Public Health	2
Bacteriology	5	Rhetoric	15
Botany	6	Rural Sociology	3
Chemistry	8	Soils	6
Dairy Husbandry	8	Veterinary Medicine	3
Education	3	Zoology	6

An average honor point ratio of 1.5 is required for graduation in 18 courses out of those listed below and out of the designated number of elective courses recommended on page 29.

Agricultural Economics 102, 103, and one elected course.

Agricultural Engineering 6, 14, 15, 33, 38, 41

Agronomy 21, 23, 31

Animal Husbandry 56, 57 or Dairy Husbandry 103, 112 or 113.
 Dairy Husbandry 1 and two elected courses
 Entomology 5
 Horticulture 6 and one elected course
 Plant Pathology 1, 3
 Poultry Husbandry 1
 Soils 4, 5
 Veterinary Medicine 52

Certification requirements for teaching vocational agriculture in Minnesota include a provision that applicants must have lived on a farm until the age of sixteen or have had two full years of farm experience after the age of sixteen.

FRESHMAN-SOPHOMORE YEARS—REQUIRED COURSES

Freshman Year

Agr. Ed. 1w,s, Introduction to Agricultural Education, 1
 Agr. Eng. 6s, Farm Buildings, 4
 Agr. Eng. 23w, General Physics, 5. Not required of students who present a year of high school physics.
 Agr. Eng. 38f, Farm Water Supply and Sewage Disposal, 2
 Agron. 1f,s,* General Farm Crops, 3
 An. Husb. 1f,w,s,* Livestock Production, 4
 Bot. 1f-2w, General Botany, 6
 Dy. Husb. 1f,s,* Elements of Dairying, 3
 Hort. 6f, Fruit Growing, 3
 Inorg. Chem. 1f-2w, General Inorganic Chemistry, 8. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 4-5
 Inorg. Chem. 4f-5w, General Inorganic Chemistry, 8 (one year of high school chemistry). Those required to take Inorg. Chem. 1-2 may omit this course.
 Math. 1f,w,s,† Higher Algebra, 5 cred., or Agr. Eng. 11w, Applied Mathematics, 5§
 Orient. 1f,w,s, College Orientation Lectures, 1
 Pl.Path. 3s, Weeds, 3
 Rhet. 1f,w,s, Rhetoric I, 3
 Rhet. 2f,w,s, Rhetoric II, 3
 Rhet. 3f,w,s, Rhetoric III, 3

Sophomore Year

Agr. Biochem. 4f, Introduction to Organic and Biochemistry, 5
 Agr. Econ. 1f, Principles of Economics I, 3
 Agr. Econ. 2w, Principles of Economics II, 5
 Agr. Eng. 41w, Metal Work, 3
 Agron. 31f,w, Principles of Genetics, 4
 Bact. 53f,w,s, General Bacteriology, 5
 Ent. 5f,w,s, Economic Entomology, 5
 Poul. Husb. 1w,s, Poultry Production, 4
 P.H. 3f,w,s,¶ Personal Health, 2
 Soils 4w, Soils, 3
 Soils 5s, Soil Management, 3
 Zool. 14f-15w, General Zoology, 6

JUNIOR-SENIOR YEARS

Students in Agricultural Education will be registered, beginning with the junior year, in both the College of Education and the College of Agriculture, Forestry, and Home Economics.

* May be omitted by students who took vocational agriculture in high school, provided suitable substitutions will be taken.

† Students will be exempt from Math. 1 who pass an exemption test given by the Department of Mathematics requiring the equivalent of Math. 1, Higher Algebra (see page 101). For any exemption the student will be required to substitute an equivalent number of credits (mathematics or electives) as approved by his adviser.

§ Credit permitted for only one of these courses.

¶ Not required of students with military service records.

Special attention of every student is called to faculty regulations for classification in the junior class.

It is recommended that the student keep in mind the possible completion of majors or minors in some agricultural groups.

Junior Year

1. Freshman-sophomore courses which were not completed. See page 9 for requirements for classification in the junior class.
2. Rhetoric 51f,w,s, Exposition, 3.
3. Social science requirement. See page 8.
4. Education courses
 - Ed. 51Af,w,s, Introduction to Secondary School Teaching, 3
 - Agr. Ed. 54f,w, Rural Education and Community Leadership, 2
 - Agr. Ed. 81f,s, Teaching Agriculture, 3
5. Agricultural courses
 - Agr. Econ. 102w, Farm Organization, 3
 - Agr. Econ. 103s, Farm Operation, 3
 - Agr. Eng. 15w, Electricity in Agriculture, 2
 - Agron. 21w, Grain Crops, 4
 - An. Husb. 56f, Livestock Feeding, 3
 - An. Husb. 57w, Livestock Feeding, 3 or Dy. Husb. 103w, Dairy Stock Feeding, 3
 - Pl. Path. 1f,s, Plant Pathology, 5
 - Pl. Path. 3s, Weeds, 3
 - Rhet. 22f,w,s, Public Speaking, 3
 - Vet. Med. 52s, Anatomy, Physiology, and Hygiene of Domestic Animals, 3

Senior Year

1. Education courses
 - Agr. Ed. 82f,w, Methods in Teaching Agriculture, 3
 - Agr. Ed. 83w, Methods in Teaching Agriculture, 2
 - Agr. Ed. 90f,w,s, Observation and Participation, 2
 - Agr. Ed. 91f,w,s, Supervised Teaching Experience, 3
 - Agr. Ed. 101f, Part-time School Instruction, 2
 - Agr. Ed. 102w, Evening School Instruction, 3
 - Agr. Ed. 103s, Facilities and Materials, 3
 - Agr. Ed. 104s, Planning Programs, 2
2. Agricultural courses
 - Agr. Eng. 14s, Farm Power and Machinery, 4
 - Agr. Eng. 33f, Introduction to Soil and Water Control, 3
 - Agron. 23f, Forage Crops, 4
 - An. Husb. 112w, Animal Breeding, 3 or An. Husb. 113s, Livestock Management, 3
 - Soc. 14f,w,s, Rural Sociology, 3

Electives Recommended To Meet Area Requirements for Graduation

Agricultural Economics, 3 credits. Suggested courses—8, 40, 50, 80, 144.

Animal and Poultry Husbandry, 3 credits. Suggested courses—Poult. Husb. 51, An. Husb. 3, 4, 51, 112, 113.

Dairy Husbandry, 5 credits. Suggested courses—3, 101, 103, 104.

Horticulture, 3 credits. Suggested courses—1, 21, 22, 32, 135.

Additional Electives Recommended

Agricultural Biochemistry 5 or 6
 Agricultural Education 56
 Agronomy 22, 132
 Education 120, 133, H.Ed. 74
 Forestry 10

Plant Pathology 3
 Publications and Rural Journalism 53
 Rhetoric 12, 24
 Veterinary Medicine 50, 51

III. AGRICULTURAL EXTENSION

Experience has shown that it is not wise or feasible, because of the wide range of possible major and minor specialization, to set up a formal curriculum for training in agricultural extension. The college does, however, offer special opportunities for an adequate training in many branches of this educational field. Any student desiring such training has the privilege as well as the responsibility of formulating his own curriculum under the general curricular requirements of Technical Agriculture or Agricultural Education.

Students planning to enter some field of agricultural extension can best prepare for this by selecting some major field and by arranging for their special extension training in the selection of their minor groups or in the selection of electives with the co-operation of advisers. The major field may be agricultural education or one of the technical divisions in the field of agriculture, such as animal husbandry, dairy husbandry, agronomy, or horticulture. Other majors are also possible. The selection of a major should be determined by the type of extension work which the student plans to follow and by the plans which the student may have as to a continuation of his study and professional development after he has become engaged in extension work.

Since agricultural extension work involves educational and other methods of presenting and promoting agricultural information and practices, it must be founded primarily on a thoro knowledge of some field of technical agriculture and a general knowledge of the whole field. The extension methods must vary with different extension jobs and must be built up on a wide range of sociological subject matter. The methods are secondary to the subject matter and for most types of extension work an attempt to formulate a major in extension is not advised altho a considerable proportion of the subject matter, of course, should be selected from courses that will have a distinct bearing on extension methods. A major adviser should be selected in the major subject-matter field of the student. It may also be advisable for such students to select a second adviser either from the extension staff or from some member of the resident teaching staff who is familiar with extension problems.

Since there is no single subject-matter course which can prepare the student for all of the intricate problems involved in extension methods and procedures, it becomes necessary for the student, with the help of his adviser, to select carefully subject-matter courses from various divisions in this college and from departments in the University which will give him a background of knowledge which can be utilized in his extension work. Many of these courses will fall in the social science groups altho some may deal with subject matter in technical agriculture. The number of technical agricultural and social science courses which would be useful are probably too numerous to be included in any one program so that the student will have to make careful selection with the aid of his advisers. For the benefit of such students and for the convenience of advisers a list of suggested courses is given below. Other courses may be advisable, or, in some cases, preferable. The list is merely suggestive.

It is generally recognized that "personality" is an important factor in the selection of extension workers and in the success of their subsequent vocational service. A judicious participation in student and community activities which give opportunities for the development of leadership is recommended. Students should also avail themselves of those numerous social and cultural opportunities of the University which contribute to a better understanding of how to meet and work with people. While the college offers no subject-matter courses in "personality," valuable criticism and advice may be secured from many faculty advisers.

REQUIREMENTS

All-college requirements for students in this college. See page 8.

SUGGESTED COURSES FOR AGRICULTURAL EXTENSION

Available as electives or required work in a curriculum especially suitable for those training for agricultural extension work:

College of Agriculture, Forestry, and Home Economics

Agricultural Economics: As many of these courses as would be feasible

Agricultural Education: Ed. 51A, Educational Psychology, or equivalent; 54, Rural Education and Community Leadership

Agricultural Engineering: Numerous courses from which to select

Publications and Rural Journalism: 53, Publicity. Possibly other courses from the School of Journalism of the College of Science, Literature, and the Arts.

Rhetoric: 22, Public Speaking; 24, Advanced Public Speaking; 28, Play Production; 59, Advanced Play Production

Subject-matter departments such as Horticulture, Agronomy, Animal Husbandry, Dairy Husbandry, Veterinary Medicine, etc. Subjects to be selected in accordance with objectives.

College of Science, Literature, and the Arts

Political Science: 1-2-3, American Government and Politics; 10, Fundamentals of Government and Politics. Other possible courses for selection.

Psychology: 1-2, General Psychology; 3, Psychology Applied to Daily Life

Sociology and Social Work: 6, Social Interaction; 14, Rural Sociology; 110, Rural Community Organization; 112, Problems in Rural Social Research; 114, Rural Social Institutions

Business Administration: 51-52-53, Business Law

The above is not a complete list of all of the possible electives that would be useful in a major curriculum in agricultural extension but includes a wide range and is suggestive of the additional possibilities.

IV. AGRICULTURAL BUSINESS ADMINISTRATION

This curriculum offers an opportunity for those who wish to prepare specifically for some branch of agricultural business, such as the marketing of farm products, farm finance, farm implements, farm real estate, country merchandising, and the like. The first two years are prescribed and include introductory courses in agriculture, economics, and the fundamental sciences necessary for further work in agriculture and economics. During the freshman and sophomore years the student will register in the College of Agriculture, Forestry, and Home Economics. In the junior and senior years he will register in both the School of Business Administration and the College of Agriculture, Forestry, and Home Economics. At least 90 credits and honor points equal to the number of credits are required for admission to the junior class. For definition of "honor points" see page 8. Approximately one third of the last two years is elective and may include approved courses in any college as well as advanced courses in agriculture and economics. The fees for the first two years are those of the College of Agriculture, Forestry, and Home Economics. For the last two years the fees are those of the School of Business Administration. Students completing this curriculum will receive the degree of bachelor of agricultural business administration.

REQUIREMENTS

All-college requirements for students in this college. See page 8.

FRESHMAN YEAR

The freshman year consists of the regular freshman courses outlined on page 27, except that students are advised to take Math. 8 rather than Agr. Eng. 11; or Math. 1 if they do not have the prerequisites for Math. 8. If any course of the freshman year is deferred to the sophomore year it should be An. Husb. 1.

SOPHOMORE YEAR

The following courses should be scheduled for the quarter as indicated.

1. Freshman courses which were not completed during the freshman year.
2. General courses
 - Agr. Econ. 1f, Principles of Economics I, 3
 - Agr. Econ. 2w, Principles of Economics II, 5 (Agr. Econ. 1)
 - Agr. Econ. 8s, Rural Economics, 3 (Agr. Econ. 2 or 3)
 - Agr. Econ. 50f, Farm Finance, 5 (Agr. Econ. 2)
 - Econ. 20f,w,s,* Elements of Accounting, 3
 - Econ. 25f,w-26w,s, Principles of Accounting, 6
 - Ent. 5f,w,s, Economic Entomology, 5 (Zool. 14-15 or equiv.)
 - Psy. 1f-2w, General Psychology, 6
 - Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)
 - Zool. 14f-15w, General Zoology, 6
3. Electives.—Enough elective credits should be selected to make with the required work of the freshman and sophomore years a total of 101 credit hours.

JUNIOR YEAR

1. General requirements
 - Bus. Adm. 51f-52w-53s, Business Law, 9 (10 cred. in econ. incl. Agr. Econ. 1 and 2)
 - Bus. Adm. 142f,w,s, Advanced Money and Banking, 3 (Agr. Econ. 2 and 50)
2. Special requirements
 - Agr. Econ. 30f, Agricultural Prices, 3 (Agr. Econ. 2)
 - Agr. Econ. 40f, Principles of Marketing Organization, 3 (Agr. Econ. 2)
 - Agr. Econ. 90f, Agricultural Statistics, 5
 - Agr. Econ. 110f-111w, Economics of Agricultural Production, 6 (Agr. Econ. 2)
 - Agr. Econ. 131w, Market Prices, 3 (Agr. Econ. 30, 40)
 - Agr. Econ. 141w, Marketing Organization: Dairy and Poultry Products, 3 (Agr. Econ. 40)
 - Rhet. 51f,w,s, Exposition, 3 (Rhet. 3)

SENIOR YEAR

1. General requirements
 - Bus. Adm. 58f,w,s, Elements of Public Finance, 3 (Agr. Econ. 2)
 - Bus. Adm. 71w,s, Transportation: Services and Charges I, 3 (Agr. Econ. 2)
 - Bus. Adm. 101f,w-102w,s, Advanced General Economics, 6 (Agr. Econ. 2)
 - Bus. Adm. 139f,† Advanced General Accounting, 3 (Econ. 25-26)
 - Econ. 149w,s, Business Cycles, 3 (Econ. 141 or Bus. Adm. 142)
2. Special requirements
 - Agr. Econ. 135s, Methods of Price Analysis, 3 (Agr. Econ. 30, 191)
 - Agr. Econ. 150s, Advanced Farm Finance, 3 (Agr. Econ. 50 or equiv.)
 - Agr. Econ. 170s, Land Economics, 3 (Agr. Econ. 110)
 - Agr. Econ. 191w, Advanced Agricultural Statistics, 3 (Agr. Econ. 90)

V. AGRICULTURAL JOURNALISM

This curriculum, which is offered jointly with the School of Journalism of the College of Science, Literature, and the Arts, is intended for those who wish to prepare for some branch of journalism which relates to agriculture: such as staff positions on agricultural magazines, editing country newspapers, writing on agricultural questions, editing of bulletins for state and federal departments of agriculture and experiment stations, editing of special farm pages or departments for newspapers, and editing of publications for farm organizations. This curriculum, requiring 180 credits for graduation, leads to the bachelor of arts degree.

MAJOR IN AGRICULTURAL JOURNALISM

Students intending to major in agricultural journalism are advised to register in journalism in the College of Science, Literature, and the Arts. Such students must have their programs of agricultural subjects approved in the office of the dean of the College of Agriculture, Forestry, and Home Economics.

* Students who have had a high school course or experience in bookkeeping may be exempted from this course and admitted to Econ. 25-26 by passing a placement test.

† Agr. Econ. 47s, Marketing Accounting, may be substituted upon approval by adviser.

Requirements for Combined Curriculum in Agriculture and Journalism

FRESHMAN YEAR

Comp. 4f-5w-6s, Freshman Composition, 9 (placement test)
 G.C. 11Af, Basic Wealth I: Natural Resources—Their Economic Utilization and Conservation, 3
 G.C. 11Bw, Basic Wealth II: The Economic Utilization and Conservation of Plant Life, 3
 G.C. 11Cs, Basic Wealth III: The Economic Utilization and Conservation of Animal Life, 3
 Nat. Sci. 1f-2w-3s, Orientation in the Natural Sciences, 15
 Electives, Social Sciences, 9-15

SOPHOMORE YEAR

Agr. Econ. 1f, Principles of Economics I; 3
 Agr. Econ. 2w, Principles of Economics II, 5 (Agr. Econ. 1)
 Comp. 27f-28w, Advanced Writing, 6 (Comp. A-B-C or 4-5-6 or exemption from requirement)
 Journ. 13f, Introduction to Reporting, 3 (C av., Eng. A-B-C or Comp. 4-5-6 or exemption from English requirement)
 Journ. 14w-15s, Newspaper Reporting, 6 (for 14, C av. in 13 and in all work, or consent of instructor, and Comp. 27-28; for 15, C av. in 13-14 or 12 and in all work, or consent of instructor, and Comp. 27-28)
 Sociol. 1f, Introduction to Sociology, 5
 Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1)
 Electives, 11-18

JUNIOR YEAR

Agr. Econ. 8s, Rural Economics, 3 (Agr. Econ. 2 or 3)
 Journ. 51f,w-52w, News Editing, 6 (Journ. 15)
 Journ. 55f,w,s, Advertising and Newspaper Typography, 3 (Journ. 15, or 13 and 41)
 Journ. 69s, Newspaper and Magazine Articles, 3 (Journ. 15 or 41)
 Journ. 110s, History of Journalism, 3 (Journ. 15)
 Electives, 27

SENIOR YEAR

Journ. 93f, Weekly Editorial Administration, 3 (Journ. 51 or concurrent registration in 51)
 Journ. 94w, Newspaper Advertising, 3 (Journ. 51)
 Journ. 112s, Current Newspaper Problems, 3 (Journ. 140 and 141)
 Journ. 140f-141w, Interpretation of Contemporary Affairs, 6 (Journ. 109-110 and 20 cred. in the social studies or consent of major adviser in Journalism)
 Pub. and Rur. Journ. 50, Agricultural Journalism, 3 (Journ. 13-14-15, 51-52 and permission of instructor)
 Electives, Journ., 3
 Electives, 24

SUGGESTED ELECTIVES

Journalism: 65, 68, 78, 95, 130-131
 Agriculture, Forestry, or Home Economics:
 Agr. Econ. 104, 110-111, 170
 Agron. 1, 31
 For. 1, 10, 136
 Home Econ. 1, 20, 24, 30, 31
 Hort. 6, 10, 24, 32
 An. Husb. 1, 56-57
 Dy. Husb. 1
 Other:
 Social Science 1-2-3
 Hist. 1-2-3, 20-21-22
 Humanities 1, 2, 3
 Pol. Sci. 1-2-3, 7, 25
 Psych. 1-2, 4-5, 56
 Sociol. 2, 45, 100, 110, 114

MINOR IN JOURNALISM

Students majoring in some field of the Technical Agriculture Curriculum or in Agricultural Extension may select a minor in Journalism. The minor program must have

the approval of the School of Journalism in the College of Science, Literature, and the Arts.

Minors in Journalism in other agricultural curricula should have the approval of the dean of the College of Agriculture, Forestry, and Home Economics.

VI. AGRICULTURAL ENGINEERING (PROFESSIONAL)

This curriculum leads to the degree of bachelor of agricultural engineering and is offered jointly by the College of Agriculture, Forestry, and Home Economics, and the Institute of Technology. Four distinct lines of specialization are provided, namely Farm Structures, Rural Electrification, Farm Power and Machinery, and Soil and Moisture Control. (See also Technical Agriculture Curriculum for students in agriculture who desire to major in Agricultural Engineering, page 23.)

FRESHMAN YEAR

During the freshman year those following this curriculum will register in the Institute of Technology and follow the work of the freshman year as outlined in the Bulletin of the Institute of Technology.

SOPHOMORE YEAR

The following courses should be scheduled for the quarter as indicated below. For the last three years of the curriculum students are registrants both in the College of Agriculture, Forestry, and Home Economics and the Institute of Technology.

General courses

- Agr. Eng. 5f, Farm Structures Laboratory, 3
- Agr. Eng. 18s, Agricultural Automotives, 4 (Phys. 7)
- Agr. Eng. 21s, Elements of Surveying, 5 (Draw. 3, M.&M. 12)
- Agr. Eng. 43f, Mechanical Laboratory, 3 (No prereq.)
- Econ. 8f, General Economics, 3
- Econ. 9w, General Economics, 3 (Econ. 8)
- M.&M. 24f,w,s, Differential Calculus, 5 (M.&M. 13)
- M.&M. 25f,w,s, Integral Calculus, 5 (M.&M. 24)
- M.&M. 26f,w,s,su, Technical Mechanics: Statics, 5 (M.&M. 25)
- Phys. 7f,s, General Engineering Physics, 5 (M.&M. 12 or equiv.)
- Phys. 8f,s, General Engineering Physics, 5 (Phys. 7)
- Phys. 9w, General Engineering Physics, 5 (Phys. 8)
- Soils, 4w, Soils, 3 (Chem. 1-2 or 4-5)

JUNIOR YEAR

Fall Quarter

- Agr. Eng. 52f, Elements of Farm Machinery, 3 (M.&M. 26)
- Geol. 5f, Engineering Geology, 3
- M.&M. 127f,w,s, Technical Mechanics: Dynamics, 5 (M.&M. 26)
- M.&M. 129f,w,s, Hydraulics, 4 (M.&M. 26)
- M.&M. 143f,w,s, Hydraulics Laboratory, 1 (M.&M. 129)
- M.E. 131f, Thermodynamics, 3 (M.&M. 25, Phys. 9)

Winter Quarter

- Agr. Econ. 102w, Farm Organization, 3 (Agr. Econ. 2)
- Agr. Eng. 51w, Soil Moisture Relations, 5 (Soils 4, M.&M. 129) or Soils 108
- M.&M. 128f,w,s, Strength of Materials, 5 (M.&M. 26)
- M.E. 26w, Mechanism and Kinematics, 3 (M.&M. 24)
- Rhet. 22w, Public Speaking, 3 (Rhet. 3 or Engl. 6)

Spring Quarter

Agron. 1s, General Farm Crops, 3 (No prereq.)
 Agr. Eng. 37s, Rural Sanitation, 3 (M.&M. 129)
 Agr. Eng. 53s, Farm Structures, 3 (Agr. Eng. 5, Draw. 3 or equiv.)
 Agr. Eng. 72s, Applied Electricity, 3 (Phys. 9) or Agr. Eng. 73s
 C.E. 37s, Structural Engineering, 3 (M.&M. 26)
 M.E. 27s, Machine Design, 3 (M.&M. 128)

SENIOR YEAR

Fall Quarter

Agr. Eng. 67f, Advanced Farm Structures Design, 3 (Agr. Eng. 53, M.&M. 128)
 Agr. Eng. 71f, Design and Economics of Agricultural Machinery, 3 (Agr. Eng. 18, 52, M.E. 27)
 Dy. Husb. 1f,s, Elements of Dairying, 3 (Entrance cred. in chem. or Inorg. Chem. 1 or 4)
 Electives to complete program

Winter Quarter

An. Husb. 1f, Livestock Production, 4
 G.E. 101w, Contracts and Specifications
 Soils 108w, Physical Properties of Soils, 3 (Soils 4) or Agr. Eng. 51
 Electives to complete program

Spring Quarter

Agr. Eng. 73s, Steam Boilers and Heat Engines, 3 (Agr. Eng. 18, M.E. 131) or Agr. Eng. 72s
 C.E. 146f,s, Plain Concrete, 3 (M.&M. 128)
 Electives to complete program

RECOMMENDED ELECTIVES

1. Farm Structures
 Agr. Eng. 44, 111-112-113; Arch. 57, 58, 59; For. 10; Hort. 24
2. Farm Power and Machinery
 Agr. Eng. 121-122-123, 126; E.E. 43-44-45; M.E. 18, 121, 132, 150; Metal. 156
3. Soil and Moisture Control
 Agr. Eng. 101-102-103; C.E. 161; M.&M. 130, 190
4. General
 Agr. Econ. 103; Bot. 1; Hort. 6

VII. RURAL EDUCATION

A joint curriculum between the College of Education and the College of Agriculture, Forestry, and Home Economics. Curriculum I-D, College of Education Bulletin. Students will register in the College of Education.

For university, college, and teachers college students who will spend the first two years largely or entirely in academic or pre-education junior college work and who wish to qualify for rural teaching and supervision.

FRESHMAN AND SOPHOMORE YEARS

For details, see Elementary Education Curricula I-A, I-B, and I-D.

JUNIOR AND SENIOR YEARS

A. Subject matter and academic courses for rural education.
Major specialization in rural life.

Course No.	Title	Credits
Agr.Econ. 3	Principles of Economics (Home Economics)	5
Agr.Econ. 8	Rural Economics	3
Agr.Ed. 54 or Agr.Ed. 56	Rural Education and Community Leadership (2 cred.)	} 2 or 3
	Rural Youth Leadership (3 cred.)	
Agron. 1	General Farm Crops	3
An.Husb. 1	Livestock Production	4
Dy.Husb. 1	Elements of Dairying	3
Hort. 6	Fruit Growing (3 cred.)	} Select one 3
Hort. 56	Plant Propagation (3 cred.)	
Hort. 32	Vegetable Growing (3 cred.)	
Soc. 14	Rural Sociology	3

A minimum of 14 credits chosen from the following :

H.E. 1	Choice and Care of Clothing (4 cred.)	} 3 or 4
G.C. 15A	Clothing Selection, Purchase and Care (3 cred.)	
H.E. 31	Introduction to Nutrition (3 cred.)	} 2 or 3
H.E. 30	Introduction to Nutrition (2 cred., Main campus)	
G.C. 14A	Food Selection and Purchase (3 cred.)	
H.E. 20	Introduction to Related Arts (4 cred.)	} 3-5
H.E. 24	Problems in Home Planning and Furnishing (5 cred.)	
G.C. 16A	Selecting and Maintaining a Home (3 cred.)	
H.E. 50	Textiles (3 cred.)	
H.E. 2	Introduction to Textiles (3 cred.)	} 3
G.C. 17B	Individual and Household Buying	
Total		40-45

B. General and Elementary Education. A major of 44 or 45 credits.

1. Required of all—39 or 40 credits.

Ed.61A,B,C	Introduction to Elementary School Teaching	9
Ed.Psy. 60	Introduction to Statistical Methods	2 or 3
ArtEd. 84	Teaching of Art in the Elementary Grades	3
Mu.Ed. 50B	Intermediate Methods	2
Ed.C.I. 60	The Teaching of Reading in the Elementary School	3
Ed.C.I. 61	The Teaching of Social Studies in the Elementary School	2
Ed.C.I. 62	The Teaching of Arithmetic in the Elementary School	2
Ed.C.I. 63	Children's Literature	2
Ed.C.I. 64	The Teaching of English in the Elementary School	3
Ed.C.I. 65	The Teaching of Science in the Elementary School	3
Ed.T. 54A-B	Directed Teaching in the Elementary School	8
or Ed.T. 54A-C	Rural School Management and Practice Teaching	8

2. Five or six credits chosen from the following courses :

Ed. C.I. 105	Visual Aids in Teaching	2
Ed. C.I. 119	Elementary School Curriculum	3
Ed. C.I. 145	Remedial Reading	2
Ed. C.I. 150	Supervision and Improvement of Instruction	3
Ed.C.I. 181	Foundations of Elementary School Methods	3
Ed. Psy. 120	Basic Principles of Measurement	3
Ed.Psy. 183	Education of Gifted Children	2
H.Ed. 162	Significance of Progressive Education	2
Total		44 or 45

3. Additional courses recommended for I-D Curriculum, to complete total of 90 credits.

Soc. 110	Rural Community Organizations	3
Soc. 114	Rural Social Institutions	3
For. 10	Farm Forestry	3

Additional courses in home economics selected from grouping listed for I-D Curriculum.

The C+ average is based on the 44 to 45 credits in elementary education.

Excess quality credits earned in all courses will reduce the general elective credits in academic subjects but cannot be used to meet any specific requirement of the curriculum.

PRE-PROFESSIONAL CURRICULUM

I. PRE-VETERINARY MEDICINE

Curriculum of one year, preparatory for entering a college of veterinary medicine, to be arranged with the assistance and approval of the adviser. In general, subjects to be taken are inorganic chemistry, one year; General Zoology 14-15, and Botany 4; English composition, one year; and electives to be selected from German, mathematics, physics, or history. Because of the grade requirements for entrance to veterinary colleges an average grade of close to B in pre-veterinary medicine is essential.

FIVE-YEAR CURRICULA

I. AGRICULTURAL TECHNOLOGY

A fifth year in agricultural technology leading to the degree of Agricultural Technologist.

Open to students graduating with the bachelor of science from an undergraduate basis of technical agriculture. Offered to those who plan to engage in occupations in the broad field of agricultural technology and who need an additional year of study (a) to extend their knowledge in their major field; (b) to obtain additional training in other general and special fields of agricultural technology; (c) to obtain training in other fields such as social science, business, engineering, and the applied sciences.

Requirements for Fifth Year

1. At least 45 additional credits with an average of B, of which 15 credits in the major and 15 of the remaining credits must be in courses numbered 100 or above.
2. A major of at least 15 credits in an agricultural division or group of allied divisions or departments.
3. A minor of not less than 15 credits in a field other than that of the major.
4. The remaining 15 credits may be chosen from any division or department of the University of Minnesota.
5. Examinations required:
 - a. A final written examination in the major.
 - b. A final oral examination by a committee of at least three.
 - c. A standing committee of the faculty shall be appointed by the dean of the college to approve student programs, to make committee appointments, and to administer these regulations.

II. AGRICULTURAL EDUCATION

A joint curriculum between the College of Education and the College of Agriculture, Forestry, and Home Economics leading to the degree of Master of Education.

The College of Education and the College of Agriculture will award the master of education degree (M.Ed.) to students who satisfactorily complete a fifth year of work in Agricultural Education at the graduate level and who meet all of the regulations for the professional degree. The specific requirements for the M.Ed. degree as applied to Agricultural Education are as follows:

1. A total of 249 credits or 45 credits beyond the requirement for a Bachelor's degree in agricultural education.

2. In addition to the period of observation and practice teaching required for graduates in the four-year curriculum, a period of internship will be required for which a maximum of 8 credits will be given.
3. In the courses comprising the fifth year of the curriculum, a "B" average (2 honor points per credit) is required.
4. Satisfactory completion of the requirements for the professional degree as defined in the Bulletin of the College of Education.
5. A satisfactory report on a health examination within one year prior to obtaining the M.Ed. degree will be required.
6. The distribution of credits for the fifth year will include:
 - a. Agricultural Education: 12-15 credits of which not more than 6 credits may be in problems courses.
 - b. Education other than Agricultural Education: 11-15 credits.
 - c. Technical Agriculture and areas other than those listed above: 15-22 credits.

NOTE—Undergraduate students in Agricultural Education who expect to qualify for the M.Ed. degree should confer with their advisers by the beginning of the junior year in order that the work of the junior, senior, and fifth years may be co-ordinated to the best advantage.

III. AGRICULTURAL ENGINEERING BUSINESS ADMINISTRATION

A curriculum offered jointly with the Institute of Technology and the School of Business Administration, leading to the degrees both of Bachelor of Agricultural Engineering and Bachelor of Business Administration. Students will register in the Institute of Technology. See statement on page 14 and the Bulletin of the Institute of Technology.

CURRICULA IN FORESTRY

Three five-year professional and two four-year technological curricula are offered students with majors in forestry. These are:

FIVE-YEAR PROFESSIONAL CURRICULA

- I. General Forestry, pages 41 and 44.
- II. Range Management (Professional), pages 42 and 44.
- III. Game Management (Professional), pages 43 and 45.

FOUR-YEAR TECHNOLOGICAL CURRICULA

- IV. Lumber Merchandising and Construction, page 45.
- V. Wood Technology, page 46.

The Professional Forestry Curricula are 5-year courses leading to the degree of master of forestry (M.F.). On completing the requirements of the first four years, the student will receive the B.S. degree. The latter is not a professional degree and does not complete the training for professional work in forestry. Before beginning the fifth year of work, the student must have completed all the requirements for the B.S. degree in the corresponding curriculum, totaling 204 credit hours of work and including a five-week field course at the Forestry and Biological Station of the University of Minnesota at Itasca State Park and one quarter of work at the Cloquet Forest Experiment Station. The professional degree, master of forestry (M.F.), is awarded only after the satisfactory completion of the fifth year of work. This fifth year, totaling 52 additional credits, mostly prescribed, also includes comprehensive written and oral examinations.

The professional curricula are designed to meet the increasingly rigid requirements for the practice of professional work in the several technical fields of actual forestry. The wide range of information and training required in the fundamental biological and physical sciences and in social sciences, together with the increasing number of technical and professional courses in forestry call for not less than five years of college work. Keener competition in the future can be successfully met only by more adequate and better professional training.

The four-year curricula in Lumber Merchandising and Construction and Wood Technology are designed to train men for special commercial and technological positions dealing with forest products. They are not accepted for training for the professional practice of forestry. On completion of these curricula, requiring 204 credits, the student receives the degree of bachelor of science (B.S.).

Students desiring to enter the Graduate School for higher degrees may do so after completion of the four-year curricula and also after completion of the first four years of any of the five-year professional curricula, provided they meet the Graduate School requirements. In such cases the student will presumably seek training for research in some special subject-matter field within or underlying the field of forestry and will register for the master of science under Plan A or Doctor's degree in the Graduate School. Altho the five-year professional courses are clearly designed as terminal professional curricula, graduates of these courses may continue in graduate study, provided they meet the requirements of the Graduate School.

FIVE-YEAR PROFESSIONAL CURRICULA

GENERAL REQUIREMENTS

All-college requirements for students in this college. See page 8.

All students, irrespective of the professional curricula which they may select, are required to complete certain general courses before graduation. These are considered fundamental and necessary to any professional curriculum in Forestry. For some students the outline for the first two years, given below, represents more than the regular amount of work of 17 credits per quarter. In such cases those subjects which cannot be taken in the freshman and sophomore years must take precedence the following year. Phys. Ed. 1-2-3, Physical Education, 3 credits, and Military Science and Tactics or Naval Science and Tactics may be taken in addition to the regular schedule, if desired. Care should be taken in registration to give precedence to courses offered in only one quarter.

During the first two years the work in all the five-year professional curricula is the same, and is devoted to the study of general courses. Preferably at the beginning of the sophomore year, and not later than the junior year, each student must decide upon the professional curriculum he wishes to follow. Special attention of every student is called to the faculty requirements for classification in the junior class, page 9.

FRESHMAN YEAR

1. Required general courses

Agr. Eng. 3s, Mechanical Drawing, 3

Bot. 1f-2w-3s, General Botany, 10

For. 1f, General Forestry, 3

For. 3w, Dendrology, 3

For. 4s, Dendrology, 4

Inorg. Chem. 1f-2w, General Inorganic Chemistry, 8. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 4-5.

Inorg. Chem. 4f-5w, General Inorganic Chemistry, 8. Those required to take Inorg. Chem. 1-2 may omit this course.

Math. 1f,w,s, Higher Algebra, 5. Students presenting higher algebra for entrance may omit this course and substitute 5 credits elective.

Math. 6f,w,s,* Trigonometry, 5 (Math. 1 or equiv.)

Orient. 1f,w,s, College Orientation Lectures, 1

Pol. Sci. 25f,w,‡ World Politics, 3

P.H. 3f,w,s,† Personal Health, 2

Soc. 1f,w,s, Sociology, 3

Total credits, 47 or 50

*First Summer Session at the Itasca Forestry and Biological Station, Itasca Park***

All students in the five-year curricula, with the exception of students who transfer to the University or college with junior standing, are required to attend this session at Itasca State Park. Transfer students who enter the University as juniors may substitute electives for this requirement, but attendance is strongly recommended. All others must complete the Itasca Park work before the beginning of the sophomore year unless given permission on petition to defer it one year. A satisfactory scholastic average must be maintained during the preceding year. In no case will such students be permitted to register for junior work before completing the summer camp requirement.

Students must register for all of the following courses:

Bot. 3su, Forest Botany, 1

Ent. 13su, Field Zoology, 1

For. 2su, Field Dendrology, 1

For. 5su, Field Silviculture, 1½

For. 6su, Field Mensuration, 1½

* Students will be exempt from the required mathematics course only in accordance with the placement tests given by the Department of Mathematics (see page 101). For any exemption the student will be required to substitute an equivalent number of credits (mathematics or electives) as approved by his adviser.

† Not required of students with military service records.

‡ Required in freshman year in General Forestry only.

** See page 8 for special fees.

- For. 11su, Camp Management, 1
 Total credits, 7
 Total credits for freshman year, 54 or 57

SOPHOMORE YEAR

1. Freshman courses not completed.
2. Required general courses
 - Agr. Biochem. 4f, Introduction to Organic and Biochemistry, 5 (Inorg. Chem. 8 cred.)
 - Agr. Biochem. 5s, Plant Biochemistry, 5 (Agr. Biochem. 4)
 - Agr. Econ. 1f, Principles of Economics I, 3
 - Agr. Econ. 2w, Principles of Economics II, 5 (Agr. Econ. 1)
 - Agr. Eng. 19f-20s, Surveying, 6 (Agr. Eng. 3, 11 or trig.)
 - Bot. 51w, General Plant Physiology, 3 (Bot. 1, 2, 3)
 - For. 7f-8w-9s, Forest Mensuration, 9 (For. 6)
 - Pl. Path. 10w,s, Forest Pathology, 5 (Bot. 6 cred.)
 - Rhet. 1f,w,s, Rhetoric I, 3
 - Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)
 - Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)
 Total credits for sophomore year 50

I. GENERAL FORESTRY

Suggested for those who are preparing themselves for general technical forest work involving the growth, management, and harvesting of forest crops (such as positions in the federal or state services, or foresters for paper companies, lumber companies, or other large timber owners). In addition to the general undergraduate requirements, the course of study for the first four years must include the following courses in the junior and senior years.

JUNIOR YEAR

1. Freshman and sophomore courses not completed.
2. Required courses
 - Agr. Eng. 24f-25w, Agricultural Physics, 8
 - Bot. 52s, Elementary Taxonomy, 3
 - Econ. 28s, Business Law, 3
 - For. 20w, Grazing, 3
 - For. 53f-54w, Wood Structure and Identification, 6
 - For. 56f, Forest Products, 3
 - For. 151f,w,s, Logging, 3
 - Geol. 8f,w,s, Introductory Geology, 5
 - Physics 29f, Introduction to Meteorology, 3
 - Soils 4w, Soils, 3
 - Zool. 14f-15w, General Zoology, 6
 Total credits for junior year, 46

SENIOR YEAR

1. Freshman, sophomore, and junior courses not completed.
2. Required courses
 - Agr. Econ. 25f,w, Accounting Principles, 4
 - Bot. 131f, Field Ecology, 5
 - Ent. 56w, Forest Entomology, 5
 - Ent. 64w, Economic Vertebrate Zoology, 3
 - Ent. 165w, Wildlife Management, 3
 - For. 137w, Seeding and Planting, 3
 - For. 155f, Forest Protection, 3
 - Rhet. 22f,w,s, Public Speaking, 3
 - Rhet. 51f,w,s, Exposition, 3
 - Soils 103f, Principles of Soil Erosion, 3
 Total credits, 35

*Spring Quarter at the Cloquet Forest Experiment Station**

(All students in the five-year professional curricula go to Cloquet.)

Students must register for all of the following courses:

- Ent. 167s, Techniques in Forest Wildlife Management, 3
- For. 128s, Silviculture Laboratory, 6
- For. 132s, Forest Regulation Laboratory, 6
- For. (Arranged), 1
- Total credits Cloquet, 16
- Total credits for senior year, 51

II. RANGE MANAGEMENT

Suggested for those who wish to prepare themselves for range management work. It is important that these men be well prepared in plant physiology, systematic botany, and plant ecology, as well as in the fundamental principles of forestry. They should have some knowledge of the feeding and breeding of livestock. In addition to the general undergraduate requirements, the course of study for the first four years must include the following courses in the junior and senior years:

JUNIOR YEAR

1. Freshman and sophomore courses not completed.
2. Required courses
 - Agr. Econ. 25f,w, Accounting Principles, 4
 - An. Husb. 1f,w,s, Livestock Production, 4
 - Bot. 131s, Field Ecology, 5
 - Ent. 56w, Forest Entomology, 5
 - For. 151f,w,s, Logging, 3
 - Physics 29f, Introduction to Meteorology, 3
 - Pl. Path. 3s, Weeds, 3
 - Rhet. 22f,w,s, Public Speaking, 3
 - Rhet. 51f,w,s, Exposition, 3
 - Soils 4w, Soils, 3
 - Zool. 1f-2w-3s, General Zoology, 10
 - Zool. 83s, Introduction to Genetics and Eugenics, 3
 - Total credits for the junior year, 49

SENIOR YEAR

1. Freshman, sophomore, and junior courses not completed.
2. Required courses
 - Agr. Eng. 24f-25w, Agricultural Physics, 8
 - Bot. 114w, Advanced Taxonomy of Flowering Plants, 3
 - Bot. 141f, Physiochemical Principles in Plant Physiology, 3
 - Ent. 165w, Wildlife Management, 3
 - For. 20w, Grazing, 3
 - Geol. 1f,w,s, General Geology, 3
 - Geol. Af,w,s, General Geology Laboratory, 2
 - Pl. Path. 4f, Grasses and Sedges, 3
 - Pol. Sci. 1f, American Government and Politics, 3
 - Electives, 4
 - Total credits, 35

* See page 8 for special fees.

*Spring Quarter at the Cloquet Forest Experiment Station**

(For all five-year curricula)

Students must register for all of the following courses:

- Ent. 167s, Techniques in Forest Wildlife Management, 3
- For. 128s, Silvicultural Laboratory, 6
- For. 132s, Forest Regulation Laboratory, 6
- For. (Arranged), 1
- Total credits Cloquet, 16
- Total credits for senior year, 51

III. GAME MANAGEMENT

Suggested for those who wish to prepare themselves for a combination of forestry and game management work. It is important that these men be acquainted with general forestry practices and have a thoro knowledge of biology. In addition to the general requirements, the course of study for the first four years must include the following courses in the junior and senior years:

JUNIOR YEAR

1. Freshman and sophomore courses not completed.
2. Required courses
 - Agr. Econ., 90f, Agricultural Statistics, 5
 - Bot. 114w-115s, Advanced Taxonomy, 6
 - Bot. 131f, Field Ecology, 5
 - Ent. 56w, Forest Entomology, 5
 - Ent. 64w, Economic Vertebrate Zoology, 3
 - Geol. 1f,w,s, General Geology, 3
 - Pol. Sci. 1f, American Government and Politics, 3
 - Rhet. 22f,w,s, Public Speaking, 3
 - Soils 4w, Soils, 3
 - Zool. 1f-2w-3s, General Zoology, 10
 - Zool. 83s, Introduction to Genetics and Eugenics, 3
 - Total credits for the junior year, 49

SENIOR YEAR

1. Freshman, sophomore, and junior courses not completed.
2. Required courses
 - Agr. Eng. 24f-25w, Agricultural Physics, 8
 - Ent. 161f, Waterfowl and Upland Game Birds, 3
 - Ent. 165w, Wildlife Management, 3
 - For. 20w, Grazing, 3
 - For. 155f, Forest Protection, 3
 - Geol. Af,w,s, General Geology Laboratory, 2
 - Rhet. 51f,w,s, Exposition, 3
 - Soils 103f, Principles of Soil Erosion, 3
 - Zool. 22w, Comparative Anatomy, 5
 - Electives, 2
 - Total credits, 35

* See page 8 for special fees

*Spring Quarter at the Cloquet Forest Experiment Station**

(For all five-year curricula)

Students must register for all of the following courses:

- Ent. 167s, Techniques in Forest Wildlife Management, 3
- For. 128s, Silviculture, 6
- For. 132s, Forest Regulation Laboratory, 6
- For. (Arranged), 1
- Total credits Cloquet, 16
- Total credits for senior year, 51

FIFTH (POSTGRADUATE) YEAR

Leading to the Professional Degree, Master of Forestry

Students who are interested in preparing themselves for professional forestry work after obtaining the Bachelor's degree may become candidates for the professional degree, master of forestry. Students who have completed the requirements for the B.S. degree in any one of the five-year professional curricula normally may expect to complete the work in one year.

The specific requirements for the degree include the completion of 52 credits, including seminars and independent work under the direction of an instructor. Under this plan neither a thesis nor a reading knowledge of a foreign language is required.

Each candidate will be required to pass written and oral examinations in the field of his specialization.

The course of study must include the following courses:

I. GENERAL FORESTRY

5th (Postgraduate) Year

- For. 111f,w, Advanced Forest Mensuration, 3
- For. 126f, Silvics, 3
- For. 127w, Silviculture, 3
- For. 130f, Forest Valuation, 5
- For. 131w, Forest Policy and Administration, 5
- For. 136w, Forest Economics, 3
- For. 140f, Forest Management Plans, 3
- For. 141w, Principles of Silvics, 3
- For. 143f, Forest Recreation, 3
- For. 220w-221s, Major Report, 4
- For. 223f-224s, Literature Seminar, 2
- Soils, 108w, Physical Properties of Soils, 3
- Electives, 12

Total credits for the fifth year, 52

II. RANGE MANAGEMENT

5th (Postgraduate) Year

- Bot. 115s, Advanced Taxonomy of Flowering Plants, 3
- For. 111f,w, Advanced Forest Mensuration, 3
- For. 126f, Silvics, 3
- For. 127w, Silviculture, 3
- For. 130f, Forest Valuation, 5
- For. 131w, Forest Policy and Administration, 5
- For. 136w, Forest Economics, 3
- For. 140f, Forest Management Plans, 3
- For. 141w, Principles of Silvics, 3
- For. 144s, Forage and Browse Plants, 3

* See page 8 for special fees.

For. 155f, Forest Protection, 3
 For. 220w-221s, Major Report, 4
 For. 223f-224s, Literature Seminar, 2
 Soils 103f, Principles of Soil Erosion, 3
 Soils 108w, Physical Properties of Soils, 3
 Electives, 3

Total credits for the fifth year, 52

III. GAME MANAGEMENT

5th (Postgraduate) Year

Ent. 163f, Mammology, 4
 For. 126f, Silvics, 3
 For. 127w, Silviculture, 3
 For. 130f, Forest Valuation, 5
 For. 131w, Forest Policy and Administration, 5
 For. 136w, Forest Economics, 3
 For. 220w-221s, Major Report, 4
 For. 223f-224s, Literature Seminar, 2
 Physics 29f, Introduction to Meteorology, 3
 Soils 108w, Physical Properties of Soils, 3
 Zool. 51f, Introductory Parasitology, 5
 Zool. 53s, Faunistic Zoology, 5
 Electives, 7

Total credits for the fifth year, 52

FOUR-YEAR CURRICULA IN LUMBER MERCHANDISING AND CONSTRUCTION AND WOOD TECHNOLOGY

GENERAL REQUIREMENTS

All-college requirements for students in this college. See page 8.

IV. LUMBER MERCHANDISING AND CONSTRUCTION*

Suggested for those who wish to enter the lumber business or the light building construction field. Includes fundamental courses in business, economics, light building construction, and training in the structure, properties, and uses of wood.

FRESHMAN YEAR

1. Required Courses

Agr. Eng. 3s, Mechanical Drawing, 3
 Econ. 20f,w,s, Elements of Accounting, 3
 For. 3w, Dendrology, 3
 For. 4s, Dendrology, 4
 Inorg. Chem. 1f-2w, General Inorganic Chemistry, 8. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 4f-5w.
 Inorg. Chem. 4f-5w, General Inorganic Chemistry, 8 (one year of high school chemistry). Those required to take Inorg. Chem. 1-2 are exempt.
 Math. 1f,w,s, Higher Algebra, 5. Students presenting higher algebra for entrance may omit this course and substitute 5 credits elective.
 Math. 6f,w,s,† Trigonometry, 5 (Math. 1 or equiv.)
 Math. 7f,w,s, College Algebra, 5 (Math. 6)
 Orient. 1f,w,s, College Orientation Lectures, 1
 Rhet. 1f-2w-3s, Rhetoric, 9
 Zool. 14f-15w, General Zoology, 6

Total credits for the freshman year, 52

* This curriculum replaces the curriculum in Commercial Lumbering. Students registered in the Commercial Lumbering Curriculum previous to the fall quarter, 1942-43 may complete that curriculum as outlined in the bulletin for the years 1940-42.

† Students will be exempt from the required mathematics courses only in accordance with the placement tests given by the Department of Mathematics (see page 101). For any exemption the student will be required to substitute an equivalent number of credits (mathematics or electives) as approved by his adviser.

SOPHOMORE YEAR

1. Freshman courses not completed

2. Required courses

- Agr. Biochem. 4f, Introduction to Organic and Biochemistry, 5 (Inorg. Chem. 8 cred.)
 Agr. Eng. 24f-25w, Agricultural Physics, 8
 Agr. Eng. 44s, Advanced Drawing, 2 (Agr. Eng. 3 or equiv.)
 Bot. 1f-2w, General Botany, 6
 Econ. 3f,w,s, Elements of Money and Banking, 5
 Econ. 6f,w,s-7f,w,s, Principles of Economics, 10
 Econ. 25f,w,s-26f,w,s, Principles of Accounting, 6 (Econ. 20)
 Econ. 28f,s, Business Law, 3
 For. 7f, Forest Mensuration, 3 (Math. 6)
 Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)
 Total credits for the sophomore year, 51

JUNIOR YEAR

1. Sophomore courses not completed

2. Required courses

- Arch. 57f-58f; 59w; 101w; 102s-103s; Building Materials and Methods, 12
 Bus. Adm. 77f,s, Survey in Marketing, 3
 Bus. Adm. 89f,s, Production Management, 3
 Bus. Adm. 142f,w,s, Advanced Money and Banking, 3 (Econ. 3 and 6-7)
 Econ. 5f,w,s, Elements of Statistics, 5
 Econ. 161f,w,s, Labor Problems and Trade Unionism, 3 (Econ. 6-7)
 Econ. 175s, Government Regulation of Business, 3 (20 cred. in soc. sci. including Econ. 6-7)
 For. 53f-54w, Wood Structure and Identification, 6 (For. 3-4)
 P.H. 3, Personal Health, 2‡
 Total credits for the Junior year, 40

SENIOR YEAR

1. Junior courses not completed

2. Required courses

- Bus. Adm. 68f, Sales Management, 3 (Bus. Adm. 77)
 Bus. Adm. 101f,w, 102w,s, Advanced General Economics, 6 (Sr. grad.; prereq. Econ. 6-7)
 For. 56f, Forest Products, 3
 For. 57w, Wood Utilization, 3 (For. 53-54)
 For. 58f, Lumber Merchandising and Grading, 3 (For. 53-54)
 For. 114f, 115w-116s, Mechanical and Physical Properties of Wood, 9 (Math. 7 and For. 53-54)
 For. 120s, Estimating, 3
 For. 125s, Wood Preservation, 3 (For. 53-54)
 For. 152s, Wood Seasoning, 3 (For. 53-54)
 Pl. Path. 10w,s, Forest Pathology, 5 (Bot. 6 cred.)
 Rhet. 51f,w,s, Exposition, 3 (Rhet. 3)
 Total credits for the senior year, 44

A sufficient number of courses to be selected in consultation with, and with the approval of, the adviser to make a total of 204 credits.

V. WOOD TECHNOLOGY

Suggested for those who wish to enter the field of pulp and paper manufacture, wood preservation, or other industries using wood as a raw material. Includes a series of courses in chemistry and mathematics and a thoro training in the structure and properties of wood. The course of study must include the following courses:

FRESHMAN YEAR

Required courses

- Bot. 1f-2w, General Botany, 6
 For. 3w, Dendrology, 3
 For. 4s, Dendrology, 4
 Inorg. Chem. 1f-2w, General Inorganic Chemistry, 8 (Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 4-5)

‡ Not required of students with military service records.

Inorg. Chem. 4f-5w, General Inorganic Chemistry, 8. (One year of high school chemistry.) Those required to take Inorg. Chem. 1-2 are exempt.

Inorg. Chem. 3s, Semimicro Qualitative Analysis, 5, or Inorg. Chem. 11f,s, Semimicro Qualitative Analysis, 4

Math. 1f,w,s, Higher Algebra, 5. Students presenting higher algebra for entrance may omit this course and substitute 5 credits elective.

Math. 6f,w,s,* Trigonometry, 5 (Math. 1 or equivalent)

Math. 7f,w,s, College Algebra, 5 (Math. 6)

Orient. 1f,w,s, College Orientation Lectures, 1

Soc. 1f,w,s, Introduction to Sociology, 3

Total credits for the freshman year, 44 or 45

SOPHOMORE YEAR

1. Freshman courses not completed

2. Required courses

Agr. Biochem. 2f,w, Quantitative Methods, 5 (Gen. Inorg. Chem. 8 cred.)

Agr. Econ. 90f, Agricultural Statistics, 5

Agr. Eng. 3s, Mechanical Drawing, 3

Math. 30f,w,s, Analytic Geometry, 5 (Math. 7)

Math. 50f,w,s, Differential Calculus, 5 (Math. 30)

Math. 51w,s, Integral Calculus, 5 (Math. 50)

Pl. Path. 10w,s, Forest Pathology, 5 (Bot. 6 cred.)

Rhet. 1f-2w-3s, Rhetoric, 9

Total credits for the sophomore year, 42

JUNIOR YEAR

1. Sophomore courses not completed

2. Required courses

Econ. 6f,w,s-7f,w,s, Principles of Economics, 10

For. 53f-54w, Wood Structure and Identification, 6 (For. 3-4)

Org. Chem. 54f-55w-156s, Elementary Organic Chemistry, 9 (15 cred. in college chem.)

Org. Chem. 57f-58w-159s, Elementary Organic Chemistry, Laboratory, 6 (Accompanied or preceded by corresponding quarter of Organic Chemistry 54-55-156)

P.H. 3f,w,s,† Personal Health, 2

Physics 7f-9w-8s, General Physics, 15 (Math. 15-16 or equiv.)

Total credits for the junior year, 48

SENIOR YEAR

1. Junior courses not completed

2. Required courses

Bact. 53f,w,s, General Bacteriology, 5 (Chem. 10 credits, 4 cred. in botany or zoology)

For. 56f, Forest Products, 3

For. 57w, Wood Utilization, 3 (For. 53-54)

For. 113w, Wood Pulp and Paper, 3

For. 114f-115w-116s, Mechanical and Physical Properties of Wood, 9 (For. 53-54, Math. 7)

For. 119s, Advanced Wood Structure, 4 (For. 53-54)

For. 125s, Wood Preservation, 3 (For. 53-54)

For. 142s, Wood Chemistry, 3 (Org. Chem. 156, 159)

For. 152s, Wood Seasoning, 3 (For. 53-54)

Phys. Chem. 101f-102w-103s, Physical Chemistry, 9 (Two years college chemistry, one year college physics, differential and integral calculus)

Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)

Rhet. 51s,w,f, Exposition, 3 (Rhet. 3)

Total credits for the senior year, 51

A sufficient number of courses to be selected in consultation with, and with the approval of, the adviser to make a total of 204 credits.

* Students will be exempt from the required mathematics courses only in accordance with the placement tests given by the Department of Mathematics (see page 101). For any exemption the student will be required to substitute an equivalent number of credits (mathematics or electives) as approved by his adviser.

† Not required of students with military service records.

CURRICULA IN HOME ECONOMICS

FOUR-YEAR CURRICULA

- I. General Home Economics, page 48.
- II. Dietetics, page 50.
- III. Home Economics Education, page 52.
- IV. Home Economics in Business, page 56.
- V. Institution Management, page 62.
- VI. Home Economics and Nursery School Education, page 64.
- VII. Home Economics Extension, page 65.
- VIII. Preparation for Research (page 66) in (a) Experimental Foods, page 67, (b) Nutrition, page 68, (c) Textiles and Clothing, page 68.

FIVE-YEAR CURRICULUM

- I. Home Economics Education, page 68.

FOUR-YEAR CURRICULA

Home Economics students on entering are assigned a program adviser who will explain the requirements of the curriculum in which the student is interested, the opportunity the University provides for counseling, orientation, and general education as a part of a home economics program.

Specialization in any of the fields of home economics involves two types of training for each student. Throughout the training period there is a core of courses required for homemaking purposes and, in addition, courses are required depending upon the student's vocational interest and choice. The four-year period includes a study of the physical, biological, and social sciences, English, and art, with opportunities for electives in other fields. The requirements for each field of specialization will be found under appropriate headings, e.g., those interested in preparing for teaching home economics, see page 52; those interested in other curricula see the appropriate pages listed above for each field.

Electives of general interest, or those which seem particularly suitable for the major sequence, should be chosen to complete the student's program. These must include enough courses in the field of social science to meet the all-college requirement of 18 credits (see page 8). Before the junior year each student must sign a specialization card for that phase of home economics in which she is most interested. Such cards are signed after conference with (a) the student's adviser and (b) the head of the section involved.

All students majoring in home economics will be required to take at least three credits in physical education. The courses chosen must be approved by the major adviser in the Department of Physical Education for Women.

Special attention is called to the faculty requirement for classification in the junior class (see page 9).

A total of at least 185 credits is required for the B.S. degree. See also requirements for *all* students in the college, page 8.

I. GENERAL HOME ECONOMICS

This curriculum is designed to satisfy the needs and interests of those persons who wish to prepare themselves for a broad general background in home economics. Opportunity is offered also for a rather wide choice of electives. This curriculum leads to no special payroll job as other curricula are designed to do.

REQUIREMENTS

All-college requirements for students in this college. See page 8.

COURSES OPEN TO FRESHMEN

Required Course No.	Title	Credits	Prerequisites
Orient. 1	College Orientation Lectures	1	None
H.E. 1	Choice and Care of Clothing	4	None
H.E. 3	Clothing Construction A	3	H.E. 1; 3rd qtr. fr. with honor point ratio of 1.00
H.E. 10	Vocational Opportunities in Home Economics	2	None, 1st qtr. fr. only
H.E. 17	Personal and Family Living	3	None
H.E. 20	Introduction to Related Art	4	None
H.E. 31	Introduction to Nutrition	3	None
H.E. 40	Food Preparation	5	8 cr. chem.; honor point ratio 1.00 or above
Rhet. 1	Rhetoric I	3	None
Rhet. 2	Rhetoric II	3	Rhet. 1 or exemption
Rhet. 3	Rhetoric III	3	Rhet. 2
Rhet. 34	Books and Readings	1	None
Soc. 1	Introduction to Sociology	3	None
Phys.Ed.	Physical Education	3	May be completed any time during four years of residence
Psy. A	Elementary Psychology	5	3rd qtr. fr.; C average
or Psy. 1-2	General Psychology	6	3rd qtr. fr.; C average

Take Group I or II

Group I			
G.C. 10A-B	Human Biology	6	None
Dy.Husb. 20 or Bact. 53	Household Microbiology	4	3rd qtr. fr.; permission of instructor (See sophomore list)
Group II			
Zool. 14-15	General Zoology	6	None
Physiol. 4	Human Physiology	4	1 qtr. zool., 1 qtr. chem.
Dy.Husb. 20 or Bact. 53	Household Microbiology	4	3rd qtr. fr.; approval of adviser and permission of instructor (See sophomore list)

Take Group I or II

Group I			
G.C. 37B	The Nature of Chemistry	5	None
G.C. 37C	Sound, Astronomy, Technology	5	None
G.C. 37A*	Physical Science	5	None
or Agr. Eng. 35*	Household Physics	5	None
Group II			
Chem. 1-2	General Inorganic Chemistry	8	None
or Chem. 4-5	General Inorganic Chemistry	8	Entrance cred. in chemistry
or Chem. 6-7	General Inorganic Chemistry	10	None
or Chem. 9-10	General Inorganic Chemistry	10	Entrance cred. in chemistry
G.C. 37A*	Physical Science	5	None
or Agr.Eng.35*	Household Physics	5	None
Agr.Biochem. 4	(See sophomore list)		

COURSES OPEN TO SOPHOMORES

H.E. 4	Clothing Construction B	3	H.E. 3
H.E. 24	Problems in Home Planning and Furnishing (to be followed by H.E. 120)	5	H.E. 20
or 21	Color and Design I	3	H.E. 20
22	Color and Design II	3	H.E. 1 and 20 (To be followed by 27, 180)

* Students who have had one year of high school physics may be exempt from Agr.Eng. 31 G.C. 37A.

Required Course No.	Title	Credits	Prerequisites
H.E. 27	Related Art Problems	3	H.E. 21; soph.
H.E. 34 or 170 and 171	Nutrition Problems	4	3rd qtr. soph.; H.E. 31, 40, physiol. or human biol.
H.E. 41	Food Management and Marketing	5	H.E. 31, 40
Rhet. 22	Public Speaking	3	Rhet. 3
Rhet. 31	Survey of English Literature	5	Rhet. 3
or 32	Survey of English Literature II	3	Rhet. 3
or 33	American Life in American Literature	3	Rhet. 3
or 60	(See junior list)		
Bact. 53 or Dy.Husb. 20	General Bacteriology	5	8 cred. in chem. and 4 cred. in bot. or zool.; soph. with C average in prereq. courses
Agr.Biochem. 4	Introduction to Organic and Biochem- istry	5	Inorg.Chem. 8-10 cred.
Agr.Econ. 3	Principles of Economics	5	None
Soc. 2	Individual and Minority Group Ad- justment	5	Soc. 1
or 14	Rural Sociology	3	Soc. 1
or 49	Social Pathology	3	3rd qtr. soph., 10 cred. in soc. or Soc. 1 and 10 cred. in soc. sci. or psy.
	(See also other junior-senior choices)		

COURSES OPEN TO JUNIORS AND SENIORS

H.E. 50	Textiles	3	H.E. 1
H.E. 85	Home Management, lectures	4	H.E. 40, H.E.Ed. 90 or parallel
H.E. 86	Home Management, laboratory	4	H.E. 85, or parallel, 40, H.E.Ed. 90, P.H.52
H.E. 120	Art History and Appreciation	3	None, must be Sr. College or grad. student
H.E. 170 and	Nutrition of the Family	3	H.E. 31, 40, Agr.Biochem. 4, and 3 cred. in physiol.
H.E. 171 or H.E. 34	Child Nutrition	3	H.E. 170, H.E.Ed. 90
H.E. 180	(See sophomore list)		
H.E. 180	Home Planning and Furnishing	5	H.E. 27, 120 recommended
Rhet. 51	(See sophomore sequence 21, 22)		
Rhet. 60	Exposition	3	Rhet. 3
P.H. 52a	Contemporary Literature	3	Rhet. 3
P.H. 52b	(See sophomore sequence 31, 32)		
Soc. 119 or Soc. 2	Health Care of the Family, lectures ..	2	Bact. 53 or Dy.Husb. 20; Physiol. 4
H.E.Ed. 90	Health Care of the Family, laboratory	1	Bact. 53 or Dy.Husb. 20; Physiol. 4
	The Family	3	Soc. 1 and 15 cred. in soc. sci., child welfare, education, phi- losophy, or psychology, or con- sent of instructor
	(See sophomore list)		
	Child Training	3	Psy. A or Psy. 1, 2 or parallel 2

Additional social science credits beyond those required above should be chosen from anthropology, economics, geography, history, political science, philosophy, psychology, or sociology to total 18 credits.

II. DIETETICS*

This curriculum is planned for those particularly interested in becoming hospital dietitians. Following graduation the student should plan to complete a dietetic internship in a hospital. Eventually, graduates with this training may be employed as administrative or therapeutic dietitians, as nutritionists in a public health agency, or as dietitians in a food clinic.

* For the Dietetics Specialization a grade of at least C is required for the following courses: Agr.Biochem. 4; H.E. 40, 41, 45, 46, 65, 170, 171; Physiol. 4. C average is required for the following group of courses: H.E. 33, 79, 173, 35, and 178.

REQUIREMENTS

All-college requirements for students in this college. See page 8.

COURSES OPEN TO FRESHMEN

Required Course No.	Title	Credits	Prerequisites
Orient. 1	College Orientation Lectures	1	None
H.E. 1	Choice and Care of Clothing	4	None
H.E. 10	Vocational Opportunities in Home Economics	2	1st qtr. fr. only
H.E. 17	Personal and Family Living	3	None
H.E. 20	Introduction to Related Art	4	None
H.E. 31	Introduction to Nutrition	3	None
H.E. 40	Food Preparation	5	8 cr. chem.; honor point ratio 1.00 or above
Rhet. 1	Rhetoric I	3	None
Rhet. 2	Rhetoric II	3	Rhet. 1 or exemption
Rhet. 3	Rhetoric III	3	Rhet. 2
Rhet. 34	Books and Reading	1	None
Zool. 14, 15	General Zoology	6	None
Chem. 1-2	General Inorganic Chemistry	8	None
or 4-5	General Inorganic Chemistry	8	Entrance credits in chemistry
or 9-10	General Inorganic Chemistry	10	Entrance credits in chemistry
or 6-7	General Inorganic Chemistry	10	None
Physiol. 4	Human Physiology	4	1 qtr. chem., 1 qtr. zool.
Agr.Eng. 35†	Household Physics	5	None
Soc. 1	Introduction to Sociology	3	None
Econ. 20	Elements of Accounting	3	3rd qtr. freshmen
or Agr.Econ. 25	(See sophomore list)		
Phys.Ed.	Physical Education	3	May be completed any time during four years of residence
Psy. A	Elementary Psychology	5	3rd qtr. fr. with C average
or Psy. 1-2	General Psychology	6	3rd qtr. fr. with C average

COURSES OPEN TO SOPHOMORES

H.E. 24	Problems in Home Planning and Furnishing	5	H.E. 20
H.E. 33	Nutrition I	4	Agr.Biochem. 4, Physiol. 4
H.E. 35	Nutrition II	4	H.E. 33
H.E. 41	Food Management and Marketing	5	H.E. 31, 40
H.E. 45	Quantity Cookery	6	H.E. 40
H.E. 46	Cafeteria Experience	3	None
Rhet. 22	Public Speaking	3	Rhet. 3
Rhet. 31	Survey of English Literature I	5	Rhet. 3
or 32	Survey of English Literature II	3	Rhet. 3
or 33	American Life in American Literature (See junior list)	3	Rhet. 3
or 60			
Bact. 53	General Bacteriology	5	8 cred. in chem. and 4 cred. in bot. or zool.; soph. with C average in prereq. courses
Agr.Biochem. 2	Quantitative Methods	5	8 cred. in inorg. chem.
Agr.Biochem. 4	Introduction to Organic and Biochemistry	5	8 cred. in inorg. chem.
Agr.Econ. 3	Principles of Economics	5	None
Agr.Econ. 25	Principles of Accounting	4	None
or Econ. 20	(See freshman list)		

COURSES OPEN TO JUNIORS AND SENIORS

H.E. 50	Textiles	3	H.E. 1
H.E. 64	Institution Buying	4	H.E. 45 or parallel; 46 or parallel—one of these required
H.E. 65	Institution Management Problems	3	H.E. 45, 46, 64
H.E. 79	Select Problems for Dietitians	3	H.E. 170 or equiv.

† Students who have had one year of high school physics may be exempt from Agr.Eng. 35.

Required Course No.	Title	Credits	Prerequisites
H.E. 85	Home Management Lectures	4	H.E. 40, H.E.Ed. 90 or parallel
H.E. 86	Home Management Laboratory	4	85 or parallel, 40, H.E.Ed. 90, P.H. 52a and 52b
H.E. 142	Experimental Cookery	3	H.E. 40, Agr.Biochem. 4
H.E. 170	Nutrition of the Family	3	H.E. 31, 40, Agr.Biochem. 4, Physiol. 3 cred.
H.E. 171	Child Nutrition	3	H.E. 170, H.E.Ed. 90
H.E. 173	Nutrition in Disease	4	H.E. 170, 35 also advised
H.E. 176	Advanced Nutrition	4	H.E. 35 or parallel, Agr.Bio- chem. 2
or 177	Digestion and Metabolism	3	H.E. 35
H.E. 178	Clinical Problems in Nutrition	2	H.E. 170, 35 or parallel
H.E. 179	Readings in Nutrition	2	H.E. 170
Rhet. 51	Exposition	3	Rhet. 3
Rhet. 60	Contemporary Literature	3	Rhet. 3
or 31 or 32 or 33	(See sophomore list)		
P.H. 52a	Health Care of the Family, lectures ...	2	Bact. 53, Physiol. 4
P.H. 52b	Health Care of the Family, labora- tory	1	Bact. 53 or Dy.Husb. 20; Physiol. 4
H.E.Ed. 90	Child Training	3	Psy. A or Psy. 1-2 or parallel 2

Additional social science credits beyond those required above should be chosen from anthropology, economics, geography, history, political science, philosophy, psychology, or sociology to total 18 credits.

III. HOME ECONOMICS EDUCATION

The College of Agriculture, Forestry, and Home Economics and the College of Education co-operate in the preparation of teachers of home economics. Satisfactory completion of the following curricula will lead to the B.S. degree and will provide the necessary training for qualification for the Minnesota "high school standard special certificate" for teaching home economics in secondary schools. Completion of this curriculum qualifies for teaching in federally aided home economics departments.

When the student has acquired a minimum of 90 credits and at least one honor point per credit (junior classification) and indicated her specialization as the teachers' or the extension curriculum, she becomes a registrant also in the College of Education. At the beginning of the junior year, the student is required to take the psychological and other examinations given in the College of Education.

Prior to registration for Supervised Teaching, the student must have completed the following requirements:

1. The College of Education examinations.
2. Home experience in clothing, foods, and other phases of home economics.
3. Certain home economics courses with at least a grade of C.*
4. Home economics courses required in the teaching curriculum with an honor point ratio of 1.5.

In order to be recommended for graduation from the teaching specialization, the student must have (1) 1½ honor points per credit in 40 credits of home economics work required in the curriculum for General Home Economics Teaching; (2) an average of 1 honor point per credit in all other courses pursued during the junior and senior years.

By a proper selection of courses, students qualifying for the degree of bachelor of science may qualify for teaching in more than one field. This is desirable since most beginning teachers in public schools are often expected to teach another subject in addition to home economics.

* For the General Home Economics Teaching Specialization a grade of at least C is required for the following courses: H.E. 3, 4, 21, 22, 27, 34 (or 170), 40, 41.

FOUR-YEAR CURRICULUM IN HOME ECONOMICS EDUCATION
LEADING TO THE B.S. DEGREE

General Home Economics Teaching

The following courses are required for those preparing for teaching general home economics:

All-college requirements for students in this college. See page 8.

COURSES OPEN TO FRESHMEN

Required Course No.	Title	Credits	Prerequisites
Orient. 1	College Orientation Lectures	1	None
H.E. 1	Choice and Care of Clothing	4	None
H.E. 3	Clothing Construction A	3	H.E. 1; 3rd qtr. fr. with honor point ratio of 1.00
H.E. 10	Vocational Opportunities in Home Economics	2	None; 1st qtr. fr. only
H.E. 17	Personal and Family Living	3	None
H.E. 20	Introduction to Related Art	4	None
H.E. 21	Color and Design I	3	H.E. 20
H.E. 22	Color and Design II	3	H.E. 1 and 20
H.E. 31	Introduction to Nutrition	3	None
H.E. 40	Food Preparation	5	8 cred. chem.; honor point ratio 1.00 or above
Rhet. 1	Rhetoric I	3	None
Rhet. 2	Rhetoric II	3	Rhet. 1 or exemption
Rhet. 3	Rhetoric III	3	Rhet. 2
Rhet. 34	Books and Reading	1	None
Soc. 1	Introduction to Sociology	3 (or 5)	None
Phys.Ed.	Physical Education	3	May be completed any time during four years of residence
Psy. 1-2	General Psychology	6	3rd qtr. fr. with C average

Take Group I or II

Group I			
Zool. 14-15	General Zoology	6	None
Physiol. 4	Human Physiology	4	1 qtr. zool., 1 qtr. chem.
Dy.Husb. 20 or Bact. 53	Household Microbiology	4	3rd qtr. fr., permission of instructor (See sophomore list)
Group II			
G.C. 10A-B	Human Biology	6	None
Dy.Husb. 20 or Bact. 53	Household Microbiology	4	3rd qtr. fr., permission of instructor (See sophomore list)

Take Group I or II

Group I			
Chem. 1-2 or 4-5 or 9-10 or 6-7	General Inorganic Chemistry	8	None
	General Inorganic Chemistry	8	Entrance credit in chemistry
	General Inorganic Chemistry	10	Entrance credit in chemistry
	General Inorganic Chemistry	10	None
G.C. 37A	Energy and Matter	5	None
or Agr.Eng. 35	Household Physics	5	None
Group II			
G.C. 37B	The Nature of Chemistry	5	None
G.C. 37A	Energy and Matter	5	None
	General Physics	5	None
or Agr.Eng. 35	Household Physics	5	None

COURSES OPEN TO SOPHOMORES

Required Course No.	Title	Credits	Prerequisites
H.E. 4	Clothing Construction B	3	H.E. 3, 20 and home practice in clothing construction§
H.E. 27	Related Art Problems	3	H.E. 21
H.E. 34 or 170, 171	Nutrition Problems	4	3rd qtr. soph., H.E. 31, 40, physiol. or human biol.
H.E. 41	Food Management and Marketing	5	H.E. 31, 40
Rhet. 22	Public Speaking	3	Rhet. 3
Rhet. 31	Survey of English Literature I	5	Rhet. 3 or permission of instructor
or 32	Survey of English Literature II	3	Rhet. 3
or 33	American Life in American Literature	3	Rhet. 3
or 60	(See junior-senior list)		
Bact. 53	General Bacteriology	5	10 cred. in chem. and 4 cred. in bot. or zool.
or Dy.Husb. 20	(See freshman list)		
Agr.Biochem. 4	Introduction to Organic and Biochemistry	5	Inorg. Chem. 8 cred.
Agr.Econ. 3	Principles of Economics	5	None
or Econ. 6-7	Principles of Economics	10	None

COURSES OPEN TO JUNIORS AND SENIORS

H.E. 50	Textiles	3	H.E. 1
H.E. 53	Advanced Clothing	3	H.E. 4, 50, home practice in clothing construction
H.E. 85	Home Management Lectures	4	H.E. 40, H.E.Ed. 90 or parallel
H.E. 86	Home Management Laboratory	4	H.E. 85 or parallel, H.E. 40, H.E.Ed. 90, P.H. 52a and 52b
H.E. 170	Nutrition of the Family	3	H.E. 31, 40, Agr. Biochem. 4, Physiol. 4 cred.
and 171 or 34	Child Nutrition	3	H.E. 170, H.E.Ed. 90
H.E. 180	(See sophomore list)		
H.E. 180	Home Planning and Furnishing	5	H.E. 27, 120 recommended
P.H. 52a	Health Care of the Family, lectures	2	Bact. 53 or Dy.Husb. 20; Physiol. 4, or permission of instructor
P.H. 52b	Health Care of the Family, laboratory	1	Bact. 53 or Dy.Husb. 20, Physiol. 4
Rhet. 51*	Exposition	3	Rhet. 3
Rhet. 60	Contemporary Literature	3	Rhet. 3
or 31 or 32 or 33	(See sophomore list)		
Ed. 51A-C	Introduction to Secondary School Teaching	6	6 cred. in psy. and a C average
Agr.Econ. 126	Economics of Consumption	3	Agr.Econ. 3
H.E.Ed. 90	Child Training	3	Psy. 1-2 or parallel 2
H.E.Ed. 91	Observation, Materials, Teaching in Home Economics	5	H.E. 4, 21, 22, 41, Psy. 1-2, Ed. 51A, 51C, parallel H.E.Ed. 93
H.E.Ed. 92	Teaching Problems in Home Economics	2	H.E.Ed. 91, 93, 94 or parallel, and 192
H.E.Ed. 93, 94	Supervised Teaching in Home Economics	6	H.E. 4, 21, 22, 41, Psy. 1-2, Ed. 51A, 51C, parallel H.E. Ed. 91, H.E.Ed. 192; home experience
H.E.Ed. 192	Evaluation in Home Economics Education	2	Ed. 51A, H.E.Ed. 91 or parallel

Additional social science credits beyond those required above should be chosen from anthropology, economics, geography, history, political science, philosophy, psychology, or sociology to total 18 credits.

* Unless exempt by examination.

§ Home experience in the construction of garments is required as a prerequisite for H.E. 4 or 53. The character and amount of experience will be determined by a member of the faculty of the Textiles and Clothing Section.

Those whose interests lead them into further specialization in the teaching field may choose one of the following groups. The student should plan her program early in her college course to be certain that she has the necessary prerequisites.

Teaching Textiles and Clothing

To the requirements in general teaching add:

Required Course No.	Title	Credits	Prerequisites
H.E. 54	Problems in Clothing Construction	3	Jr., sr.; H.E. 53 or permission of instructor
H.E. 102	Advanced Textiles	3	Jr., sr.; H.E. 50, Agr.Biochem. 4, Agr.Econ. 3 or parallel
H.E. 115	Clothing Economics	3	Jr., sr.; H.E. 50, Agr.Econ. 3
H.E. 120	Art History and Appreciation	3	Senior College and grad. students only
Bot. 4	General Botany	5	None

Teaching Foods

To the requirements in general teaching add:

H.E. 45	Quantity Cookery	6	Jr., sr.; H.E. 40
H.E. 142	Experimental Cookery	3	Jr., sr.; H.E. 40, Agr. Biochem. 4
H.E. 146	Special Food Problems	3	Sr.; H.E. 142
Agr.Biochem. 2	Quantitative Methods	5	Soph., jr., sr.; Inorg.Chem. 8 cred.

Teaching Nutrition

Omit from the requirements in general teaching the following courses: H.E. 3, 4, 21, 22, 27, 53, 180, G.C. 37A-B, 10A-B and Agr. Econ. 126.

To the requirements in general teaching add:

H.E. 24	Problems in Home Planning and Furnishing	5	Soph.; H.E. 20
H.E. 142	Experimental Cookery	3	Jr., sr.; H.E. 40, Agr.Biochem. 4
H.E. 173	Nutrition in Disease	3	Jr., sr.; H.E. 170, 175 also advised
H.E. 179	Readings in Nutrition	2	Jr., sr.; H.E. 170

Teaching Related Art

Those interested in teaching Related Art should:

- Select the minimum credit requirement in science when there is an option.
- Omit Agr.Econ. 126.
- Add the following:

H.E. 23	Advanced Design	3	Soph., jr.; H.E. 21 or 22
H.E. 25	Design Applied to Crafts	3	Soph.; H.E. 21 or 22
H.E. 120	Art History and Appreciation	3	Open to Senior College and grad. students only
H.E. 122	Advanced Interior Design	3	Jr., sr.; H.E. 180, 120 or permission of instructor
or 125	Advanced Costume Design	3	Jr., sr.; H.E. 4 or permission of instructor, H.E. 22; 25 recommended
H.E.Ed. 197	Organization and Methods for Related Art Teaching	1-3	Sr.; H.E.Ed. 91, H.E. 180 or parallel

Six credits from the following in Art Education or Architectural Drawing:

ArtEd. 4, 6, 8	Basic Drawing	2 a qtr.	None
or Arch. DP-I	Drawing and Painting	2 a qtr.	None

IV. HOME ECONOMICS IN BUSINESS

Students planning to use home economics training in business may choose one of the following fields in which to specialize.

Foods and Nutrition*

While the Division of Home Economics has no organized plan for practical experience in foods in business, such experience is valuable to students majoring in this field. This experience might take the form of a summer or part-time position in a public utility company, experimental kitchen, food industry, department store demonstration, or similar enterprise. The student's ability to get this experience will depend on her own initiative and success in the work she undertakes. The ability to use a typewriter is important. For those interested in radio work, participation in the Radio Guild is suggested.

An organized plan for home experience is a requirement for this curriculum. The project is to be chosen in consultation with a member of the faculty of the foods section after the completion of H.E. 41.

All-college requirements for students in this college. See page 8.

COURSES OPEN TO FRESHMEN

Required Course No.	Title	Credits	Prerequisites
Orient. 1	College Orientation Lectures	1	None
H.E. 1	Choice and Care of Clothing	4	None
H.E. 10	Vocational Opportunities in Home Economics	2	1st qtr. fr. only
H.E. 17	Personal and Family Living	3	None
H.E. 20	Introduction to Related Art	4	None
H.E. 31	Introduction to Nutrition	3	None
H.E. 40	Food Preparation	5	8 cred. in chem.; honor point ratio 1.00 or above
Rhet. 1	Rhetoric I	3	None
Rhet. 2	Rhetoric II	3	Rhet. 1 or exemption
Rhet. 3	Rhetoric III	3	Rhet. 2
Rhet. 34	Books and Reading	1	None
Zool. 14-15	General Zoology	6	None
Physiol. 4	Human Physiology	4	1 qtr. zool., 1 qtr. chem.
Chem. 1-2	General Inorganic Chemistry	8	None
or 4-5	General Inorganic Chemistry	8	Entrance cred. in chemistry
or 6-7	General Inorganic Chemistry	10	None
or 9-10	General Inorganic Chemistry	10	Entrance credit in chem.
Agr.Eng. 35†	Household Physics	5	None
Soc. 1	Introduction to Sociology	3 (or 5)	None
Dy.Husb. 20 or preferably Bact. 53	Household Microbiology	4	3rd qtr. fr., permission of instructor (See sophomore list)
Phys.Ed.	Physical Education	3	May be completed at any time during four years' residence
Psy. A	Elementary Psychology	5	3rd qtr. fr.; C average
or Psy. 1-2	General Psychology	6	3rd qtr. fr.; C average
Any two of the following:			
G.C. 26A	Photography	3	None
Jour. 41	(See junior-senior list)		
Jour. 69	(See junior-senior list)		
An.Husb. 54	(See junior-senior list)		
Speech 65	(See junior-senior list)		

* For the Foods and Nutrition in Business Specialization a grade of at least C is required for the following courses: H.E. 40, 41, 142, 170; Rhet. 22; Jour. 69 or 70.

† Students who have had one year of high school physics may be exempt from Agr.Eng. 35 or G.C. 37A.

COURSES OPEN TO SOPHOMORES

See courses listed for freshmen.

Required Course No.	Title	Credits	Prerequisites
H.E. 24	Problems in Home Planning and Furnishing	5	H.E. 20
H.E. 41*	Food Management and Marketing	5	H.E. 31, 40
H.E. 45	Quantity Cookery	6	H.E. 40
H.E. 46	Cafeteria Experience	3	None
Rhet. 22	Public Speaking	3	Rhet. 3
Rhet. 24	Advanced Public Speaking	3	Rhet. 22 or 23
Rhet. 31	Survey of English Literature I	5	Rhet. 3
or 32	Survey of English Literature II	3	Rhet. 3
or 33	American Life in American Literature	3	Rhet. 3
or 60	(See junior-senior list)		
Agr.Biochem. 4	Introduction to Organic and Biochemistry	5	Inorg. Chem. 8 credits
Agr.Econ. 3	Principles of Economics	5	None
Bact. 53	General Bacteriology	5	10 cred. in chem.; 4 cred. in bot. or zool.
or Dy.Husb. 20	(See freshman list)		
Jour. 13	Introduction to Reporting	3	Soph., jr., sr., with C average; Eng. A-B-C or Comp. 4-5-6 or exemption from English requirement

COURSES OPEN TO JUNIORS AND SENIORS*

H.E. 50	Textiles	3	H.E. 1
H.E. 71	Demonstrations	1	Open only to 3rd qtr. jr., sr.
H.E. 85	Home Management Lectures	4	H.E. 40, H.E.Ed. 90 or parallel
H.E. 86	Home Management Laboratory	4	H.E. 85 or parallel, 40, H.E.Ed. 90, P.H. 52a and 52b
H.E. 120	Art History and Appreciation	3	None; Senior College and grad. only
H.E. 142	Experimental Cookery	3	H.E. 40, Agr.Biochem. 4
H.E. 146	Special Food Problems	3	H.E. 142, open to sr. only
H.E. 170	Nutrition of the Family	3	H.E. 31, 40, Agr.Biochem. 4, Physiol. 3 cred.
H.E. 171	Child Nutrition	3	H.E. 170, H.E.Ed. 90
H.E. 179	Readings in Nutrition	2	H.E. 170
H.E. 180	Home Planning and Furnishing	5	H.E. 21, 22, 27, 120 recommended
or 24	(See sophomore list)		
H.E.Ed. 90	Child Training	3	Psy. A or Psy. 1-2 or parallel 2
Psy. 56	Psychology of Advertising	3	Psy. 1-2, Agr.Econ. 3
P.H. 52a	Health Care of the Family, lectures ..	2	Bact. 53 or Dy.Husb. 20, Physiol. 4
P.H. 52b	Health Care of the Family, laboratory	1	Bact. 53 or Dy.Husb. 20, Physiol. 4
Bus.Adm. 88	Advertising	3	Agr.Econ. 126 or B.A. 77, and Psy. 56
Agr.Econ. 126	Economics of Consumption	3	Agr.Econ. 2 or 3
or Econ. 185	Economics of Marketing	3	Econ. 6-7 or 83
or Bus.Adm. 167	Personnel Administration	3	Econ. 161
or Econ. 161	Labor Problems and Trade Unions	3	Econ. 6-7 or 83
Rhet. 51	Exposition	3	Rhet. 3
Rhet. 60	Contemporary Literature	3	Rhet. 3
or 31 or 32 or 33	(See sophomore list)		

Any two of the following:

Jour. 41	Editing for Nonmajors	3	Jour. 12 or 13
Jour. 69	Newspaper and Magazine Articles	3	Jour. 15 or 41

* Home experience is required in some phase or phases of food work. The project to fulfill this requirement is to be chosen in consultation with a member of the faculty of the Foods Section after completion of H.E. 41 and before entering the senior year.

Required Course No.	Title	Credits	Prerequisites
An.Husb. 54	Utilization of Meats	3	None
Speech 65	Radio Speech	3	Rhet. 24
G.C. 26A	(See Freshman list)		

Additional social science credits should be chosen from anthropology, economics, geography, history, political science, philosophy, psychology, or sociology to total 18 credits.

Related Art†

The curriculum in Related Art and Business is planned to give students a background of knowledge and experience in the applications of color and design, leading primarily to work in department stores, interior furnishing studios, and dress and specialty shops. The curriculum listed here constitutes a basic preparation in the general field of related art with a major emphasis upon interior furnishings and dress design.

For those students who wish to specialize in Costume Design or in Related Art and Journalism, certain courses in the basic curriculum may be omitted and others added.

All-college requirements for students in this college. See page 8.

COURSES OPEN TO FRESHMEN

Orient. 1	College Orientation Lectures	1	None
H.E. 1	Choice and Care of Clothing	4	None
H.E. 10	Vocational Opportunities in Home Economics	2	1st qtr. fr. only
H.E. 17	Personal and Family Living	3	None
H.E. 20	Introduction to Related Art	4	None
H.E. 21	Color and Design I	3	H.E. 20
H.E. 22	Color and Design II	3	H.E. 1 and 20
H.E. 31	Introduction to Nutrition	3	None
H.E. 40	Food Preparation	5	8 cred. chem.; honor point ratio 1.00 or above
Rhet. 1	Rhetoric I	3	None
Rhet. 2	Rhetoric II	3	Rhet. I or exemption
Rhet. 3	Rhetoric III	3	Rhet. II
Rhet. 34	Books and Reading	1	None
G.C. 10A	Human Biology I	3	None
G.C. 10B	Human Biology II	3	None
P.H. 3§	Personal Health	2	None
P.H. 4§	Health Problems of Adult Life	2	P.H. 3
G.C. 37A	Energy and Matter	5	None
or Agr.Eng. 35*	Household Physics	5	None
G.C. 37B	The Nature of Chemistry	5	None
Soc. 1	Introduction to Sociology	3	None
Hist. 1-2	European Civilization	8	None
or 17	Social and Economic History of Modern Europe	5	3rd qtr. fr.
Psy. A	Elementary Psychology	5	3rd qtr. fr.; C average
or Psy. 1-2	General Psychology	6	3rd qtr. fr.; C average
Phys.Ed.	Physical Education	3	May be completed at any time during four years of residence
ArtEd. 4, 6, 8	Basic Drawing	2 a qtr.	None
or Arch.DP-I	Drawing and Painting	2 a qtr.	None
	(6 credits to be selected from any of the preceding courses)		
Fine Arts	Any course	3	

* Students who have had one year of high school physics may be exempt from Agr.Eng. 35 or G.C. 37A.

† For Related Art in Business Specialization a grade of at least C is required for the following courses: H.E. 21, 22, 27, 122, 125, 180. It is recommended that each home economics student interested in business learn to use a typewriter.

§ P.H. 3, 4 are not accepted for teaching. Take instead G.C. 10A, B; Dy. Husb. 20 and P.H. 52a and 52b.

COURSES OPEN TO SOPHOMORES

Required Course No.	Title	Credits	Prerequisites
H.E. 23	Advanced Design	3	H.E. 21 or 22
or 25	Design Applied to Crafts	3	H.E. 21 or 22
or 26	Decorative Needlework and Other Crafts	3	H.E. 21
H.E. 27	Related Art Problems	3	H.E. 21
H.E. 34	Nutrition Problems	4	3rd qtr. soph.; H.E. 31, 40; Physiol. or Human Biology
Rhet. 22	Public Speaking	3	Rhet. 3
Rhet. 31	Survey of English Literature I	5	Rhet. 3
or 32	Survey of English Literature II	3	Rhet. 3
or 33	American Life in American Literature (See junior list)	3	Rhet. 3
or 60			
Comp. 27-28	Advanced Writing	6	Eng. A-B-C or 4-5-6 or exemption
or Jour. 12	Newspaper Reporting	5	None; Comp. 27-28 advised
or 13	Introduction to Reporting	3	Eng. A-B-C or exemption
or 41	(See junior list)		
or 5 or 6	additional credits in English literature.		
Agr.Econ. 3	Principles of Economics	5	None
or Econ. 6-7	Principles of Economics	10	None

COURSES OPEN TO JUNIORS AND SENIORS

H.E. 50	Textiles	3	H.E. 1
H.E. 85	Home Management Lectures	4	H.E. 40, H.E.Ed. 90 or parallel
H.E. 86	Home Management Laboratory	4	H.E. 85 or parallel, 40, H.E.Ed. 90, P.H. 52a and 52b
H.E. 120	Art History and Appreciation	3	Senior College and grad. students only
H.E. 121	Textile Design	3	H.E. 50, 27
H.E. 122	Advanced Interior Design	3	H.E. 180 or parallel, 120 or permission of instructor
H.E. 125*	Advanced Costume Design	3	H.E. 4 or permission of instructor, H.E. 22, 25 recommended
H.E. 180	Home Planning and Furnishing	5	H.E. 27, 120 recommended
Rhet. 51	Exposition	3	Rhet. 3
Rhet. 60	Contemporary Literature	3	Rhet. 3
or 31 or 32 or 33	(See sophomore list)		
Agr.Econ. 126	Economics of Consumption	3	Agr.Econ. 2 or 3
Psy. 56	Psychology of Advertising	3	Psy. 1-2 and Agr. Econ. 3
or Bus.Adm. 88	Advertising	3	Permission of instructor
Jour. 41	Editing for Nonmajors	3	Jour. 12 or 13
or Comp. 27-28	(See sophomore list)		
or Jour. 12 or 13			
or 5 or 6	additional credits in English Literature.		
H.E.Ed. 90	Child Training	3	Psy. A or Psy. 1-2 or parallel 2
Bus.Adm. 69	Retail Store Management	3	Agr.Econ. 3

Additional social science credits beyond those required above should be chosen from anthropology, economics, geography, history, political science, philosophy, psychology, or sociology to total 18 credits.

Costume Design

To the general courses listed under Related Art add:

H.E. 3	Clothing Construction A	3	3rd qtr. fr. with honor point ratio of 1.00, H.E. 1
H.E. 4	Clothing Construction B	3	Soph.; H.E. 3, 20 and home practice in clothing construction
H.E. 115	Social and Economic Aspects of Clothing	3	Jr.; H.E. 50, or parallel, Agr. Econ. 3

* This course may be omitted for those who are specializing in Interior Furnishing.

Required Course No.	Title	Credits	Prerequisites
OMIT			
H.E. 122	Advanced Interior Design	3	H.E. 180, 120, or permission of instructor
Arch.DP-I	Drawing and Painting	2 a qtr.	None

Journalism*

To the general courses listed under Related Art add:

Comp. 27-28	Advanced Writing	6	Eng. A-B-C or 4-5-6 or exemption
Jour. 13	Introduction to Reporting (for minors)	3	Soph.; Eng. A-B-C or Comp. 4-5-6 or English exemption
or 12	Newspaper Reporting	5	Soph., permission of chairman of department
or 14-15	Newspaper Reporting	5	Soph.; Comp. 27-28, Jour. 13 or 12 or permission of instructor
Jour. 41	Editing for Nonmajors	3	Jr.; Jour. 12 or 13
Jour. 69	Newspaper and Magazine Articles	3	Jr.; Jour. 15 or 41
or 73-74	Newspaper and Magazine Articles	6	Jr.; Jour. 15
OMIT			
ArtEd. 6, 8	Basic Drawing	2 a qtr.	None
Arch.DP-I	Drawing and Painting	2 a qtr.	None
Agr.Econ. 25	Principles of Accounting	4	None
or Econ. 20	Elements of Accounting	3	None

Eighteen credits are required in Composition 27-28 and Journalism courses.

Textiles and Clothing†

For those who wish to specialize in the general field of Textiles and Clothing in Business the following courses are required.

All-college requirements for students in this college. See page 8.

COURSES OPEN TO FRESHMEN

Orient. 1	College Orientation Lectures	1	None
H.E. 1	Choice and Care of Clothing	4	None (Not open to students having had G.C. 15A)
H.E. 3	Clothing Construction A	3	H.E. 1
H.E. 10	Vocational Opportunities in Home Economics	2	None; 1st qtr. fr. only
H.E. 17	Personal and Family Living	3	None
H.E. 20	Introduction to Related Art	4	None
H.E. 21	Color and Design I	3	H.E. 20
H.E. 22	Color and Design II	3	H.E. 1 and 20
H.E. 31	Introduction to Nutrition	3	None
H.E. 40	Food Preparation	5	8 cred. in chem.; honor point ratio 1.00 or above
Rhet. 1	Rhetoric I	3	None
Rhet. 2	Rhetoric II	3	Rhet. 1 or exemption
Rhet. 3	Rhetoric III	3	Rhet. 2
Rhet. 34	Books and Reading	1	None
Agr.Eng. 35§	Household Physics	5	None
or G.C. 37A	Energy and Matter	5	None
Phys.Ed.	Physical Education	3	May be taken at any time during four years of residence
Soc. 1	Introduction to Sociology	3	None
Psy. A	Elementary Psychology	5	3rd qtr. fr.; C average
or Psy. 1-2	General Psychology	6	3rd qtr. fr.; C average

* For the specialization in Related Art and Journalism a grade of C is required in courses in English and Journalism in addition to the C grade requirements in Related Art.

† For Textiles and Clothing in Business a grade of at least C is required in the following courses: H.E. 3, 4, 21, 22, 50, 102, 107, 115. It is recommended that the home economics student interested in business learn to use a typewriter.

§ Students who have had one year of high school physics may be exempt from Agr.Eng. 35 or G.C. 37A.

CURRICULA

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Take Group I or II

Required Course No.	Title	Credits	Prerequisites
Group I			
Zool. 14-15	General Zoology	6	None
Physiol. 4	Human Physiology	4	1 qtr. zool., 1 qtr. chem.
Dy.Husb. 20 or Bact. 53	Household Microbiology	4	3rd qtr. fr., permission of instructor
Group II			
G.C. 10A-B	Human Biology	6	None
Dy.Husb. 20 or Bact. 53	Household Microbiology	4	3rd qtr. fr., permission of instructor
Chem. 1-2 or 4-5 or 6-7 or 9-10 or G.C. 37B	General Inorganic Chemistry	8	None
	General Inorganic Chemistry	8	Entrance cred. in chem.
	General Inorganic Chemistry	10	None
	General Inorganic Chemistry	10	Entrance cred. in chem.
	Nature of Chemistry (Omit for textile testing)	5	None

COURSES OPEN TO SOPHOMORES

H.E. 4	Clothing Construction B	3	H.E. 3 and home practice in clothing construction
H.E. 27	Related Art Problems	3	H.E. 21
H.E. 34 or 170, 171	Nutrition Problems	4	3rd qtr. soph., 31, 40, physiol. or human biol.
Rhet. 22	Public Speaking	3	Rhet. 3
Rhet. 31 or 32	Survey of English Literature I	5	Rhet. 3
or 33 or 60	Survey of English Literature II	3	Rhet. 3
Bact. 53 or Dy.Husb. 20	American Life in American Literature	3	Rhet. 3
Agr.Biochem. 4	(See junior courses)		
	General Bacteriology	5	Chem. 10 cred., Zool. or Bot. 4 cred.
	(See freshman list)		
	Introduction to Organic and Bio-chemistry	5	Inorg.Chem. 8 cred. or G.C. 37B
Agr.Econ. 3 or Econ. 6-7	Principles of Economics	5	None
Agr.Econ. 25 or Econ. 20	Principles of Economics	10	None
	Principles of Accounting	4	None
	Elements of Accounting	3	None

COURSES OPEN TO JUNIORS AND SENIORS

H.E. 50	Textiles	3	H.E. 1
H.E. 85	Home Management Lectures	4	H.E.Ed. 90 or parallel, H.E. 40
H.E. 86	Home Management Laboratory	4	H.E. 85 or parallel, H.E. 40, H.E.Ed. 90, P.H. 52a and 52b
H.E. 102	Advanced Textiles	3	H.E. 50, Agr.Biochem. 4, Agr. Econ. 3 or Econ. 6-7 or parallel
H.E. 115	Economic and Social Aspects of Clothing	3	H.E. 50, Agr.Econ. 3
H.E. 116	Family Clothing Problems	3	H.E. 50
H.E. 120	Art History and Appreciation	3	Jr., sr., and grad. only
H.E. 170	Nutrition of the Family	3	H.E. 31, 40; Agr.Biochem. 4, Physiol. 4 or G.C. 10A, B
and H.E. 171 or 34	Child Nutrition	3	H.E. 170, H.E.Ed. 90
	(See sophomore list)		
H.E. 180	Home Planning and Furnishing	5	H.E. 27, 120 recommended
Rhet. 51	Exposition	3	Rhet. 3
Rhet. 60 or 31 or 32 or 33	Contemporary Literature	3	Rhet. 3
P.H. 52a	(See sophomore list)		
	Health Care of the Family, lectures	2	Bact. 53 or Dy.Husb. 20, Physiol. 4

Required Course No.	Title	Credits	Prerequisites
P.H. 52b	Health Care of the Family, laboratory	1	Bact. 53 or Dy.Husb. 20, Physiol. 4
Agr.Econ. 126	Economics of Consumption	3	Agr.Econ. 2 or 3, or Econ. 6-7
Bus.Adm. 69	Retail Store Management	3	B.A. 77
Bus.Adm. 77	Survey of Marketing	3	Econ. 6-7 or Agr.Econ. 3
Bus.Adm. 88	Advertising	3	Econ. 2 or B.A. 77 and Psy. 56
H.E.Ed. 90	Child Training	3	Psy. A or Psy. 1-2 or parallel 2
Psy. 56	Psychology of Advertising	3	Psy. A or Psy. 1-2 and Principles of Economics

In addition, the student will choose the phase of Textiles and Clothing in Business in which she is interested and for which special requirements are listed.

Store or Other Commercial Enterprises

H.E. 53	Advanced Clothing	3	Jr.; H.E. 4, 50 or parallel
French or 1	One year high school French Beginning French	5	Fr.; none

Journalism

Comp. 27-28	Advanced Writing	6	Eng. A-B-C or 4-5-6 or exemption
H.E. 53	Advanced Clothing	3	Jr.; H.E. 4, 22, 50
Jour. 13	Introduction to Reporting (for journalism minors)	3	Soph. with C average; Eng. A-B-C or Comp. 4-5-6 or exemption
or 12	Newspaper Reporting	5	Soph., jr., sr. with average of C; Eng. A-B-C or Comp. 4-5-6 or exemption from English requirement and consent of instructor
Jour. 41	Editing for Nonmajors	3	Jr.; Jour. 12 or 13
Jour. 69	Newspaper and Magazine Articles	3	Jr.; Jour. 15 or 41

Textile Testing

H.E. 107	Textile Analysis	3	Jr.; H.E. 102, Agr.Biochem. 2
Bot. 4	General Botany	5	Fr.; none
P.H. 110	Biometric Principles	3	18 cred. biol. sci. or math. through anal. geom.; to be taken with 111
and P.H. 111 or Agr.Econ. 90	Biostatistics Laboratory	2	To be taken with 110
Agr.Biochem. 2	Agricultural Statistics	5	Jr.
Agr.Biochem. 4	Quantitative Methods	5	Soph.; 8-10 cred. in inorg. chem.
	Introduction to Organic and Biochemistry	5	Soph.; 8-10 cred. in inorg. chem.

Additional social science credits beyond those required above should be chosen from anthropology, economics, geography, history, political science, philosophy, psychology, or sociology to total 18 credits.

V. INSTITUTION MANAGEMENT*

The curriculum in Institution Management is planned to provide background and initial experience for those students who are interested in food service of a commercial nature, such as that in restaurants, cafeterias, school lunchrooms, and tearooms. Those persons considering this field of training must bear in mind that practical experience before graduation is very important. This experience may be gained in vacation periods by securing minor positions at camps, hotels, restaurants, or tearooms where food is prepared and served in large quantities.

* For the Institution Management Specialization a grade of at least C is required for the following courses: H.E. 40, 41, 45, 46, 63, 64, 163, 170.

It is highly recommended that the student who wishes to progress in the field of Institution Management plan to take an internship, upon graduation, either in the commercial field or in a college. These internships are planned to give enough experience in a variety of situations to enable the graduate to qualify for good positions upon completion of the course. Consult your adviser about internships.

We recommend that each student who wishes to secure a position of responsibility (1) use vacation periods to get a well-rounded work experience, (2) plan on a fifth year in an apprentice training course, and (3) learn how to use a typewriter.

All-college requirements for students in this college. See page 8.

COURSES OPEN TO FRESHMEN

Required Course No.	Title	Credits	Prerequisites
Orient. 1	College Orientation Lectures	1	None
H.E. 1	Choice and Care of Clothing	4	None
H.E. 6	Institution Experience	3	None
H.E. 10	Vocational Opportunities in Home Economics	2	None; 1st qtr. fr. only
H.E. 17	Personal and Family Living	3	None
H.E. 20	Introduction to Related Art	4	None
H.E. 31	Introduction to Nutrition	3	None
H.E. 40	Food Preparation	5	8 cred. chem.; honor point ratio 1.00 or above
Rhet. 1	Rhetoric I	3	None
Rhet. 2	Rhetoric II	3	Rhet. 1 or exemption
Rhet. 3	Rhetoric III	3	Rhet. 2
Rhet. 34	Books and Reading	1	None
Zool. 14-15	General Zoology	6	None
or G.C. 10A,B	Human Biology	3	None
Chem. 1-2	General Inorganic Chemistry	8	None
or 4-5	General Inorganic Chemistry	8	Entrance cred. in chem.
or 9-10	General Inorganic Chemistry	10	Entrance cred. in chem.
or 6-7	General Inorganic Chemistry	10	None
Physiol. 4	Human Physiology	4	1 qtr. chem. and 1 qtr. zool.
Dy.Husb. 20	Household Microbiology	4	3rd qtr. fr.; permission of instructor
or Bact. 53	(See sophomore list)		
Agr.Eng. 35†	Household Physics	5	None
or G.C. 37A	Energy and Matter	5	None
Soc. 1	Introduction to Sociology	3	None
Econ. 20	Elements of Accounting	3	3rd qtr. fr.
or Agr.Econ. 25	(See sophomore list)		
Phys.Ed.	Physical Education	3	May be taken at any time during four years in residence
Psy. A	Elementary Psychology	5	3rd qtr. fr.; C average
or Psy. 1-2	General Psychology	6	3rd qtr. fr.; C average

COURSES OPEN TO SOPHOMORES

H.E. 24	Problems in Home Planning and Furnishing	5	H.E. 20
H.E. 41	Food Management and Marketing	5	H.E. 31, 40
H.E. 45	Quantity Cookery	6	H.E. 40
H.E. 46	Cafeteria Experience	3	None
Rhet. 22	Public Speaking	3	Rhet. 3
Rhet. 31	Survey of English Literature I	5	Rhet. 3
or 32	Survey of English Literature II	3	Rhet. 3
or 33	American Life in American Literature	3	Rhet. 3
or 60	(See junior list)		

† Students who have had one year of high school physics are exempt from Agr.Eng. 35 or G.C. 37A.

Required Course No.	Title	Credits	Prerequisites
Bact. 53 or Dy.Husb. 20 Agr.Biochem. 4	General Bacteriology (See freshman list) Introduction to Organic and Biochem- istry	5 5	10 cred. in chem., 4 cred. in bot. or zool. Inorg.Chem. 1-2 or 4-5
Agr.Econ. 3 or Econ. 6, 7	Principles of Economics	5	None
Agr. Econ. 25 or Econ. 20	Principles of Economics	10	None
Soc. 2	Principles of Accounting	4	None
	(See freshman list) Individual Minority Group Adjust- ments	3	Soc. 1
or 14	Rural Sociology	3	Soc. 1

COURSES OPEN TO JUNIORS AND SENIORS

H.E. 50	Textiles	3	H.E. 1
H.E. 64	Institution Buying	4	H.E. 45 or parallel, 46 or paral- lel—one of these required
H.E. 65	Institution Management Problems	3	H.E. 45, 46, 64
H.E. 173	Nutrition in Disease	4	H.E. 170, 35 also advised
H.E. 85	Home Management Lectures	4	H.E. 40, H.E.Ed. 90 or parallel
H.E. 86	Home Management Laboratory	4	H.E. 85 or parallel, 40, H.E.Ed. 90, P.H. 52a and 52b
H.E.Ed. 90	Child Training	3	Psy. A or Psy. 1-2 or parallel 2
H.E. 142	Experimental Cookery	3	H.E. 40, Agr.Biochem. 4
H.E. 146	Special Food Problems	3	H.E. 142
H.E. 170	Nutrition of the Family	3	H.E. 31, 40, Agr.Biochem. 4, Physiol. 3 cred.
H.E. 171	Child Nutrition	3	H.E. 170, H.E.Ed. 90
Rhet. 51	Exposition	3	Rhet. 3
Rhet. 60 or 31 or 32 or 33	Contemporary Literature	3	Rhet. 3
P.H. 52a	(See sophomore list) Health Care of the Family, lectures	2	Bact. 53 or Dy.Husb. 20, Physiol. 4
P.H. 52b	Health Care of the Family, labora- tory	1	Bact. 53 or Dy.Husb. 20, Physiol. 4
Agr.Econ. 126	Economics of Consumption	3	Agr.Econ. 2 or 3
Bus.Adm. 77 or Econ. 185	Survey in Marketing	3	None; Agr. Econ. 3 desirable
Bus.Adm.167 or Econ. 161	Economics of Marketing	3	Econ. 6-7 or 83
or Psy. 160	Personnel Administration	3	Permission of department
An.Husb. 54	Labor Problems	3	Econ. 6-7
	Psychology in Personnel Work	3	Psy. 1-2, Econ. 6-7
	Utilization of Meats	3	None; H.E. 40, 41 desirable

Additional social science credits beyond those required above should be chosen from anthropology, economics, geography, history, political science, philosophy, psychology, or sociology to total 18 credits.

VI. HOME ECONOMICS AND NURSERY SCHOOL EDUCATION

All-college requirements for students in this college. See page 8.

A few promising students can be encouraged to pursue this combination. The student and her program must be approved by the director of the Nursery School and the chief of the Division of Home Economics. In addition to the General Home Economics program the following courses, offered by the Institute of Child Welfare, will be required. These courses are open to juniors and are offered by the Institute of Child Welfare. They are listed under Methods and Directed Teaching in the Bulletin of the College of Education.

JUNIOR-SENIOR COURSES

Ed.T. 55	Principles of Early Childhood Educa- tion	3	C.W. 80 or parallel
Ed.T. 56	Permanent Play Materials	2	Psy. 1-2
Ed.T. 57	Plastic Materials	3	C.W. 80

Required Course No.	Title	Credits	Prerequisites
Ed.T. 58	Rhythmic Games and Music for the Young Child	2	Ed.T. 55
Ed.T. 59	Story Telling for Young Children	2	Ed.T. 55
Ed.T. 75	Methods and Observation in Nursery School	3	Ed.T. 55, 56, 57, 58, 59, C.W. 40

Additional social science credits beyond those required above should be chosen from anthropology, economics, geography, history, political science, philosophy, psychology, or sociology to total 18 credits.

VII. HOME ECONOMICS EXTENSION

A combined curriculum with the College of Education. See all-college requirements for students in the College of Agriculture, Forestry, and Home Economics, page 8.

Some students will be interested in preparation for home economics positions in the Agricultural Extension Service, such as home demonstration agent, 4-H Club agent, or homemaking specialists.

The student following this curriculum should be one who has a real interest in rural life and rural people and has ability to get along well with them. A sense of humor, good health, a high degree of initiative, good standards for personal appearance, good judgment and ideals for rural family living are important qualities for the extension worker. Organization ability and clear expression of ideas, written and oral, are necessary. She should be a person alert to social situations and the need and willingness for continuous learning on a job. Residence in rural areas and some contact with extension work before coming to college is desirable in order that the student shall have an understanding of farm conditions.

This curriculum is planned to give the future extension worker understandings and skills in homemaking activities, an understanding of physical and social science as it relates to rural areas, use of oral and written materials, ability for administration and organization of adult and youth programs, an understanding of educational principles and techniques suitable for rural groups.

An organized program of home experience is required to be completed before the end of the junior year. This should be planned and approved by the member of the Home Economics Education section responsible for teacher training of adults.

Students following this curriculum will receive guidance from a committee of the Home Demonstration staff of the Extension Service and the Home Economics Education faculty. Qualified students will be recommended for a period of supervised pre-extension field experience to be arranged during the summer following the junior year. Approval for this field service must be secured from the director of the Agricultural Extension Service.

Those in this curriculum should:

Omit from the requirements in general home economics teaching the following courses: H.E. 53, Agr. Biochem. 4, Rhet. 34, 51, Ed. 51C, H.E.Ed. 92, 94, 192, Agr. Econ. 126.

Add to the requirements in general home economics teaching:*

Soc. 2	Individual and Group Adjustment	5	Soc. 1
or Soc. 14	Rural Sociology	3	Soc. 1
or Soc. 91	Case Methods Applied to the Study of Human Problems	3	Jr., sr., Soc. 50 or 51 or consent of major adviser
or Soc. 95	Introduction to Public Welfare	3	Jr., sr., Soc. 50 or 51 or consent of major adviser
or Soc. 101	Social Organization	3	Jr., sr., grad.; Soc. 1 and 15 cred. in social sci., child welfare, education, philosophy, or psychology, or consent of instructor

* The required 3 credits in Physical Education are to be chosen from the Dance (country, folk, modern, or social) and recreational games.

Required Course No.	Title	Credits	Prerequisites
Pub. 53	Publicity	3	Jr., sr., Rhet. 1, 2, 3
H.E.Ed. 95	Field Experience for Home Demonstration Agents	6	Completion of jr. year, consent of head of Home Econ. Educ., and Director of Extension
H.E.Ed. 194A	Adult Education in Home Economics	3	Jr., sr., grad.; H.E.Ed. 91, 93 or parallel
or H.E.Ed. 194B	Adult Education in Home Economics	3	Jr., sr., grad.; H.E.Ed. 91, 93 or parallel
Agr.Econ. 8	Rural Economics	3	Jr., sr., Agr.Econ. 2 or 3
or Agr.Econ. 126	Economics of Consumption	3	Jr., sr., Agr.Econ. 2 or 3

VIII. PREPARATION FOR RESEARCH

A. Major in Experimental Foods

B. Major in Nutrition

C. Major in Textiles and Clothing

These curricula are planned for superior students who wish to be prepared to pursue graduate work, with the expectation of filling a teaching and research position after receiving an advanced degree. The options and electives offered should be selected in consultation with a major adviser of the Graduate School faculty. An average honor point ratio of 1.5 must be maintained. The following courses are required for all students taking these curricula.

All-college requirements for students in this college. See page 8.

COURSES OPEN TO FRESHMEN

Orient. 1	College Orientation Lectures	1	None
H.E. 1	Choice and Care of Clothing	4	None
H.E. 10	Vocational Opportunities in Home Economics	2	None; 1st qtr. fr. only
H.E. 17	Personal and Family Living	3	None
H.E. 20	Introduction to Related Art	4	None
H.E. 31	Introduction to Nutrition	3	None
H.E. 40	Food Preparation	5	8 cred. in chem.; honor point ratio 1.00 or better
Rhet. 1	Rhetoric—Composition	3	None
Rhet. 2	Rhetoric—Exposition	3	Rhet. 1 or exemption
Rhet. 3	Rhetoric—Description and Narration	3	Rhet. 2
Rhet. 34	Books and Reading	1	None
Zool. 14, 15	General Zoology	6	None
Dy.Husb. 20 or Bact. 53	Household Microbiology	4	3rd qtr. fr.; permission of instructor (See sophomore list)
Physiol. 4	Human Physiology	4	1 qtr. chem. 1 qtr. zool.
Chem. 1-2	General Inorganic Chemistry	8	None
or 4-5	General Inorganic Chemistry	8	Entrance cred. in chem.
or 6-7	General Inorganic Chemistry	10	None
or 9-10	General Inorganic Chemistry	10	Entrance credits in chem.
Agr.Eng. 35	Household Physics	5	
or Phys. 1, 2, 3	Introduction to Physical Science	9	H.S. alg. and plane geom.
or 1a, 2a, 3a	Introduction to Physical Science	12	H.S. alg. and plane geom.
or 4, 5, 6	General Physics	15	Math. 15-16 or Math. 6, 7, 8
or 7, 8, 9	General Physics	15	Math. 15-16 or equiv.
Soc. 1	Introduction to Sociology	3	None
Phys.Ed.	Physical Education	3	May be taken at any time during four years in residence
Math.	Mathematics	10	
Language	Modern Languages	10	
Psy. A	Elementary Psychology	5	3rd qtr. fr.; C average
or Psy. 1-2	General Psychology	6	3rd qtr. fr.; C average

COURSES OPEN TO SOPHOMORES

Required Course No.	Title	Credits	Prerequisites
H.E. 24	Problems in Home Planning and Furnishing	5	H.E. 20
or 180	(See junior list)		
H.E. 34	Nutrition Problems	4	3rd qtr. soph.; H.E. 31, 40, physiol. or human biol.
or 170	(See junior list)		
Rhet. 22	Public Speaking	3	Rhet. 3
Rhet. 31	Survey of English Literature I	5	Rhet. 3 or permission of instructor
or 32	Survey of English Literature II	3	Rhet. 3
or 33	American Life in American Literature	3	Rhet. 3
or 60	(See junior list)		
Bact. 53	General Bacteriology	5	8 cred. in chem.; 4 cred. in bot. or zool.; soph. with C average in prereq. courses
or Dy.Husb. 20	(See freshman list)		
Agr.Biochem. 2	Quantitative Methods	5	8 cred. in inorg. chem.
or Anal.Chem. 1-2	Quantitative Analysis	10	Chem. 12-13
or Anal.Chem. 7	Quantitative Analysis	4	Any course in qual. chem.
Agr.Biochem. 4	Introduction to Organic Chemistry	5	10 cred. in inorg. chem
or Org.Chem. 1-2	Elementary Organic Chemistry	8	Inorg.Chem. 11 or equiv.
or Org.Chem. 54-55	Elementary Organic Chemistry, lecture and	6	15 cred. in chem.
Org.Chem. 57-58	Elementary Organic Chemistry, laboratory	4	Ofg.Chem. 54, 55 or parallel
Agr. Econ. 3	Principles of Economics	5	None
or Econ. 6-7	Principles of Economics	10	None

COURSES OPEN TO JUNIORS AND SENIORS

H.E. 50	Textiles	3	H.E. 1
H.E. 85	Home Management Lectures	4	H.E. 40, H.E.Ed. 90 or parallel
H.E. 86	Home Management Laboratory	4	H.E. 40, 85 or parallel, H.E.Ed. 90, P.H. 52a and 52b
H.E. 120	Art History and Appreciation	3	Sr. College or grad. student
H.E. 170	Nutrition of the Family	3	H.E. 31, 40; Agr. Biochem. 4; Phys. 3 cred.
or 34	(See sophomore list)		
H.E. 180	Home Planning and Furnishing	5	H.E. 21, 27
or 24	(See sophomore list)		
Rhet. 51	Exposition	3	Rhet. 3
Rhet. 60	Contemporary Literature	3	Rhet. 3
or 31 or 32 or 33	(See sophomore list)		
P.H. 52a	Health Care of the Family, lectures	2	Bact. 53 or Dy.Husb. 20, Physiol. 4
P.H. 52b	Health Care of the Family, laboratory	1	Bact. 53 or Dy.Husb. 20, Physiol. 4
H.E.Ed. 90	Child Training	3	Psy. A or Psy. 1-2 or parallel 2

Additional social science courses should be chosen from anthropology, economics, geography, history, philosophy, political science, psychology, or sociology to total 18 credits.

A. MAJOR IN EXPERIMENTAL FOODS

A major sequence in experimental foods must include in addition to the foregoing courses, H.E. 41, Food Management and Marketing (5 cred.; soph.; prereq. H.E. 31 and 40) and H.E. 142, Experimental Cookery (3 cred.; jr.; prereq. H.E. 40 and Org. Chem.)

B. MAJOR IN NUTRITION

A major sequence in nutrition, which may include courses clearly related or fundamental thereto, and to make a total of 24 to 36 credits which must include in addition to the required courses listed above, H.E. 41, Food Management and Marketing (5 cred.; soph.; prereq. H.E. 31, 40), H.E. 142, Experimental Cookery (3 cred.; jr.; prereq. H.E. 40, Org. Chem.), H.E. 33, Nutrition I (4 cred.; soph., jr., sr.; Ag. Biochem. 4, Physiol. 4 or parallel), H.E. 171 (3 cred.; jr., sr.; H.E. 170, H.E.Ed. 90).

A minor sequence of 10 to 12 credits to be chosen outside the field of nutrition, e.g., bacteriology, biochemistry, economics, physics, physiology, sociology, or statistics, and not to include any of the courses required for all.

C. MAJOR IN TEXTILES AND CLOTHING

A major sequence in textiles and clothing which may include courses clearly related or fundamental thereto, to make a total of 24 to 36 credits and which must include, in addition to the required courses listed above, H.E. 3, Clothing Construction A (3 cred.; fr.; prereq. H.E. 1) and H.E. 102, Advanced Textiles (3 cred.; jr.; prereq. 50, Org. Chem., Prin. of Econ.)

A minor sequence of 10 to 12 credits to be chosen outside the field of textiles and clothing, e.g., biochemistry, botany, economics, physics or statistics, and not to include any of the courses required for all.

See also All-College curricula, pp. 17, and Rural Education Curriculum, p. 35.

FIVE-YEAR CURRICULUM

I. HOME ECONOMICS EDUCATION

A joint curriculum between the College of Education and the College of Agriculture, Forestry, and Home Economics leading to the degree of master of education.

A five-year program in Home Economics Education, leading to the M.Ed. degree, will be provided for those who wish to make additional preparation prior to their entrance into teaching and for those who wish to continue their professional work following the completion of the requirements for a Bachelor's degree. The five-year curriculum will qualify a person for high school teaching and for some college positions. The attainment of added training should facilitate professional promotion.

Special requirements

1. A total of 230 credits including at least 45 (courses numbered above 100) in the fifth year.
2. An average of B in courses in the fifth year.
3. A satisfactory report on a health examination within one year prior to obtaining the M.Ed. degree.
4. Satisfactory performance in requirements prescribed by the College of Education for professional degrees:
 - a. 90 quarter credits in academic fields
 - b. A teaching minor or concentration in an academic field (18 credits)
 - c. Broad major field specialization (approximately 90 credits)
 - d. 35 quarter credits in education including one quarter internship (optional—8 credits allowed for 1 quarter)

The best results may be anticipated when plans for the extended training are made during the student's junior year in residence so that the fifth year may be integrated with the four-year program. The student should plan her program under the direction of a member of the graduate faculty in Home Economics Education.

Satisfaction of part of the education requirement may be made through internship in a home economics department in a secondary school. The internship will include full-

time work for one quarter in a home economics department in a secondary school off the campus. The intern will work under the supervision of her adviser at the University and will return to the campus regularly for Saturday morning conferences which will deal with classroom, extra-curricular, and community problems met during the internship.

REQUIREMENTS FOR A FIFTH YEAR LEADING TO THE M.ED. DEGREE*

Requirements	Credits
1. Additional academic courses	8-24
2. Home Economics	17-25
3. General Education	4-9
4. Home Economics Education	5-9
Total	45

Satisfactory completion of the fifth year work will be determined by

1. A written comprehensive examination covering home economics materials.
2. A written examination in education courses.
3. Certification of competence in teaching in the major field.
4. An oral examination by the graduate committee of the College of Education and a representative of the Division of Home Economics.

Students with a Bachelor's degree and a major in home economics education from other accredited institutions, upon fulfilling the requirements of the five-year curriculum or their equivalents, will receive the M.Ed. degree with a major in home economics education.

* See College of Education Bulletin for specific course suggestions.

DESCRIPTION OF COURSES

AGRICULTURAL BIOCHEMISTRY

Freshman and Sophomore Courses

This division offers two types of work, namely courses in those phases of chemistry which have special application in agriculture or home economics for students whose major work is in their divisions; and courses designed to train chemists for research or instruction in the special field of agricultural biochemistry.

Students planning to specialize in agricultural biochemistry in the Science Specialization Curriculum should secure in their junior-senior years a broad fundamental foundation of courses in chemistry, biology, physics, and mathematics.

The following courses are suggested as providing the essential basic training for the junior-senior years and for the first year of postgraduate work:

Organic Chemistry 54, 55, 156 (15 credits) Physics 4-5-6 or 7-8-9 (15 credits); Mathematics through Integral Calculus; Physical Chemistry 101-102-103 (9 credits); Agronomy and Plant Genetics 31 (4 credits); Agricultural Biochemistry 2, 101-102, 113-114-115, 119, 120, 121, 122, and 123 and either 116 and 103 or 108-110, depending on whether the student's interest lies in animal or plant biochemistry.

For those students who plan to specialize later in the animal phases of biochemistry certain courses in animal husbandry, dairy husbandry, zoology, bacteriology or physiology should be included in the junior-senior years. Similarly for those desiring to specialize in the plant phases of biochemistry, courses in botany, plant genetics, plant pathology, forestry, plant physiology and bacteriology are desirable adjuncts. These supporting subjects should be selected in consultation with the student's major adviser.

- 2.‡ Quantitative Methods. Principles of quantitative analysis, including stoichiometric problems, practice in the use of the balance and in typical gravimetric and volumetric manipulation. (5 cred.; soph., jr., sr.; prereq. Inorg. Chem. 8 cred.)
4. Introduction to Organic and Biochemistry. An introduction to the chemistry of carbon compounds directed toward an understanding of the principles underlying the classification, structure, and general properties of those which are of biological importance. (5 cred.; soph., jr., sr.; prereq. Inorg. Chem. 8 cred.)*
5. Plant Biochemistry. An introduction to the chemistry, metabolism, and nutrition of plants based on the organic and inorganic compounds which are characteristic of plants and plant products, and their reactions and interactions. (5 cred.; soph., jr., sr.; prereq. 4, Soils 4 advised)
6. Animal Biochemistry. An introduction to the chemistry, metabolism, and nutrition of animals based on the organic and inorganic compounds which are characteristic of animals and animal products, and their reactions and interactions. (5 cred.; soph., jr., sr.; prereq. 4, Soils 4 advised)
- 101‡‡-102‡‡ Agricultural Quantitative Analysis. The estimation of inorganic and organic constituents of biological products, the proximate analysis of foods and feeding stuffs, the use of the polariscope, immersion refractometer, colorimeter and nephelometer, viscosimeter, and other special apparatus. (6 cred.; jr., sr.; prereq. 2)

* By special permission of the student's adviser, General College Courses 37A and 37B will be acceptable as prerequisites for home economics students.

‡ A laboratory fee of \$2 is required for this course. A \$5 card (from which the \$2 fee will be deducted) is to be purchased from the cashier's office, University Farm, before a laboratory desk will be assigned.

‡‡ A laboratory fee of \$5 is required for each quarter of this course. The \$5 card purchased from the cashier's office, University Farm, must be presented before laboratory space will be assigned. A \$5 breakage card against which breakage can be charged must be purchased also.

- 103.‡ Dairy Chemistry. Lectures and laboratory work on the physical, colloidal, and chemical properties of milk and dairy products, the chemistry of the various constituents of milk and of the processes involved in the manufacture of dairy products. (5 cred.; jr., sr.; prereq. 2, 6)
108. Chemistry of Wheat and Wheat Products. A lecture course, with collateral library reference work, on the chemical technology of the production and milling of wheat and the conversion of its products into human food. (3 cred.; jr., sr.; prereq. 5)
- 110.‡ Flour Laboratory Methods. A laboratory course in methods of analysis of wheat and its products; milling tests of wheat, baking, and special tests of flour. Designed to train students for research and control work in the cereal industry. (3 to 5 cred.; jr., sr.; prereq. 101-102 or equiv.)
- 113‡-114‡-115.‡ Biochemical Laboratory Methods. A laboratory course paralleling the lectures in 119-123, using recent methods for the investigation of biologically important compounds. (6 cred.; jr., sr.; prereq. quant. anal., parallel 119, 123)
116. Advanced Animal Nutrition. Recent developments in animal nutrition, covering the field of proteins, mineral metabolism, and vitamins. (3 cred.; jr., sr.; prereq. 6 or Physiol. Chem. 120 advised)
- 117.‡ Laboratory Problems in Animal Nutrition. A laboratory course on methods used in nutrition studies. (3 cred.; jr., sr.; prereq. 116, instructor's permission)
- 118.‡ Laboratory Problems in Biochemistry. Special laboratory work in the preparation and isolation of pure compounds which occur in living cells, the study of biochemical reactions, and special methods of identification or determination of biochemical products. (3 or 5 cred.; sr.; prereq. 113-114, 119; or 103 or 110)
119. Colloids. Lectures and assigned readings dealing with the colloidal state of matter, the preparation and properties of colloidal systems, and the relation of these to biochemical processes. (3 cred.; sr.; prereq. Zool. or Bot. 10 cred., and 5 cred. in Org. Chem. equivalent to 4; 5 or 6 advised)
120. Proteins. Lectures and assigned readings on compositions, structure, chemical and physical properties, and the functions of proteins and amino acids. (3 cred.; sr.; prereq. 119)
121. Carbohydrates. Lectures and assigned readings on the composition, structure, chemical and physical properties, and the functions of the carbohydrates. (3 cred.; sr.; prereq. 119)
122. The Lipids and Fats. Lectures and assigned readings on the composition, structure, chemical and physical properties, and the functions of the fats and fatlike compounds. (3 cred.; sr.; prereq. 119)
123. Enzymes. Lectures and assigned readings on enzyme action, including the methods of preparation and investigation of enzymes and their function in biological and industrial processes. (3 cred.; sr.; prereq. 119)

AGRICULTURAL ECONOMICS

Students desiring to major in agricultural economics will work out a program suited to their needs in consultation with an adviser in the division. Opportunities for specialization in various fields such as farm management, marketing, agricultural prices, farm finance, and the like are available. Among the courses recommended for majors are Agr. Econ. 8, 25, 30, 40, 50, 80, and 90.

‡ A laboratory fee of \$5 is required for each quarter of this course. The \$5 card purchased from the cashier's office, University Farm, must be presented before laboratory space will be assigned. A \$5 breakage card against which breakage can be charged must be purchased also.

Freshman and Sophomore Courses

1. Principles of Economics I. For students in agriculture and forestry. (3 cred.; soph., jr., sr.; no prereq.)
2. Principles of Economics II. For students in agriculture and forestry. (5 cred.; soph., jr., sr.; prereq. 1)
3. Principles of Economics. For students in home economics. (5 cred.; soph., jr., sr.; no prereq.)
7. Natural Resources. A study of the natural resources of the United States and other countries in their relation to agriculture. Attention is given to the importance of these resources and to their wise utilization. Lectures, reference work, and discussions. (3 cred.; soph., jr., sr.; no prereq.)
8. Rural Economics. An analysis of a number of the important economic problems of agriculture, including organization of the agricultural industry, tenancy, farm incomes, rural population and standards of living, tariff, taxation, and agricultural policy. (3 cred.; soph., jr., sr.; prereq. 2 or 3)
25. Principles of Accounting. (4 cred.; soph., jr., sr. in agr., for., and home econ. only)
30. Agricultural Prices. Factors determining prices and trends in prices of agricultural commodities. Adjustment of production to price changes. Foreign competition. Price stabilization. Price policies. (3 cred.; soph., jr., sr.; prereq. 2)
40. Principles of Marketing Organization. The principles of the organization of the market and of marketing enterprises, both proprietary and co-operative. (3 cred.; soph., jr., sr.; prereq. 2)
47. Marketing Accounting. Interpretations of accounts, statement preparation, and analysis. Accounting methods and statements of agricultural marketing organizations including co-operative associations. Utilization of accounting data and statements by the management. (4 cred.; soph., jr., sr.; prereq. 25)

Junior and Senior Courses

- 50.* Farm Finance. The mechanism of exchange with special reference to the financing of the production and marketing of farm products. (5 cred.; jr., sr. in agr. or for. only; prereq. 2)
- 80.* Farm Accounting. Kinds and uses of farm records; calculation of measures of farm earnings; accounting analysis of farm business. Discussion and practice. (3 cred.; jr., sr.)
- 90.* Agricultural Statistics. Statistical method applied to the analysis of agricultural data; collection, tabulation, and graphical presentation; averages; measures of dispersion; time series, and simple correlation. (5 cred.; jr., sr.)
102. Farm Organization. Characteristics of farming as a business; factors determining type of farming; farm tenure and farm selection; farm layout and farm improvements; factors affecting the selection of crops and livestock for a particular farm. (3 cred.; jr., sr.; prereq. 2)
103. Farm Operation. Farm budgeting; personal and business factors affecting farm financial success; utilization of labor, power, and equipment; farm management research methods and farm management services. Special problem in farm planning. Field visit to well-managed farms. (3 cred.; jr., sr.; prereq. 102)
104. Types of Farming. A study of factors affecting the geographic distribution of agricultural production by type-of-farming areas and of crop and livestock systems and practices within these areas. (3 cred.; jr., sr.; prereq. 2)

* Open to sophomores on petition.

DESCRIPTION OF COURSES

73

- 110-111. Economics of Agricultural Production I and II. The principles of production economics applied to agriculture, special emphasis being placed upon profitable combinations of factors of production, comparative advantage, and localization of production. (6 cred.; jr., sr.; prereq. 2)
 126. Economics of Consumption. Nature of human wants; standards of living; costs of living; income, administration of income; nature of demand; demand and price; relation of consumption to the population problem. (3 cred.; jr., sr.; prereq. 2 or 3)
 131. Market Prices. Manner in which prices are determined in the market place. Local, wholesale, and retail prices. Price fluctuation and speculation. Prices and market grades. Market quotations. (3 cred.; jr., sr.; prereq. 30, 40)
 135. Methods of Price Analysis. Statistical methods for the study of the forces determining prices, forecasting price changes, and determining "established prices." Survey of research work in the field. (3 cred.; sr.; prereq. 30, 191)
 140. Marketing Organization: Staples. Principles of production economics applied to the organization of markets and marketing organization for the grains, tobacco, cotton, and wool. Special attention to grain marketing. (3 cred.; jr., sr.; prereq. 40)
 141. Marketing Organization: Dairy and Poultry Products. (3 cred.; jr., sr.; prereq. 40)
 142. Marketing Organization: Fruits and Vegetables. (2 cred.; jr., sr.; prereq. 40)
 143. Marketing Organization: Livestock and Meats. (3 cred.; jr., sr.; prereq. 40)
 144. Co-operative Organization. Development of co-operation in agriculture in the United States and foreign countries. Analysis of economic problems peculiar to co-operative organization, especially of marketing agencies. (3 cred.; jr., sr.; prereq. 40)
 150. Advanced Farm Finance. A consideration of credit problems of farmers with special attention to institutions financing farmers. (3 cred.; jr., sr.; prereq. 50 or equiv.)
 170. Land Economics. Land as a factor of production; rural and urban utilization; rents and land values; land classification; land exchange. (3 cred.; jr., sr.; prereq. 110)
 191. Advanced Agricultural Statistics. Analysis of agricultural data by methods of correlation, partial and multiple correlation, analysis variance and significance of results. (3 cred.; jr., sr.; prereq. 90)
- See also courses in Economics and Business Administration.

AGRICULTURAL EDUCATION

Courses for Undergraduate Students

1. Introduction to Agricultural Education. An orientation course for students who are interested in exploring the opportunities for employment and service as teachers of agriculture. Qualifications of teachers and a survey of preparatory offerings. (1 cred.; fr.; no prereq.)
54. Rural Education and Community Leadership. The rural school as a community center, and ways and means of organizing educational and recreational activities, such as clubs, festivals, fairs, and other desirable features of rural community life. (2 cred.; jr., sr.; prereq. Ed. 51A)
56. Rural Youth Leadership. A lecture, demonstration, and laboratory course in co-operation with leaders and specialists in the various fields and problems of rural youth leadership with emphasis on 4-H clubs, Future Farmers of America, and extension activities. (3 cred.; jr., sr.; no prereq.)
81. Teaching Agriculture. Organization and administration of the program for teaching agriculture in the secondary school. Relationships to other rural programs, planning farm practice activities, guidance for rural youth, and the use of the home, farm, and community in teaching agriculture. (3 cred.; jr., sr.; prereq. Ed. 51A)

- 82.‡ Methods in Teaching Agriculture. Fundamentals of method in teaching as related to teaching agriculture in high school. Organizing subject matter of daily work; selection and manipulation of devices. Classroom and laboratory method. Specific plans for teaching secondary school agriculture. (3 cred.; sr.; prereq. 81)
- 83.‡ Methods in Teaching Agriculture (continuation of 82). (2 cred.; sr.; prereq. 82)
- 90.‡ Observation and Participation. Observation of agriculture departments in operation, including facilities, classes, and supervised practice. Individual reports and class discussions of observations. (2 cred.; jr., sr.; prereq. 81)
- 91.‡ Supervised Teaching Experience. Preparation of lesson plans and actual teaching of classes under careful supervision in recitation and laboratory; criticism and discussion of plans, methods, and results of student teaching. (3 cred.; sr.; prereq. 82 and a C+ average in major)

Courses for Undergraduate and Graduate Students

101. Part-time School Instruction. Instructional programs for rural young men not regularly enrolled in school. Analysis of rural youth situations and placement problems. (2 cred.; sr.; prereq. 81)
102. Evening School Instruction. Instructional programs for adult farmer groups. Organization of courses, teaching procedures, follow-up work, community programs of adult education. (3 cred.; sr.; prereq. 81)
103. Facilities and Materials. A study of the physical arrangement for departments of vocational agriculture. Building facilities, room fixtures, references, equipment, visual aids, illustrative materials. (3 cred.; sr.; prereq. 82)
104. Planning Programs. Long-time and annual plans for departments of vocational agriculture. Schedule of activities, analyzing results. (2 cred.; sr.; prereq. 82)
121. Enterprise Analysis. Experience in analyzing enterprises in agriculture as a basis for identifying problems and distributing them in the horizontal set-up for the course of study in agriculture. (2 cred.; prereq. Ed. 51A)
141. Supervised Practice in Vocational Agriculture. A special course dealing with the selection, planning, supervising, and summarizing of the practical work in agriculture. Special emphasis on the use of the farm and community for teaching purposes. (3 cred.; prereq. 10 cred. in ed.)
145. The Integrated Course of Study in Agriculture. A presentation of the problems of organization, administration, and teaching in departments of agriculture in the secondary schools. Special emphasis on planning programs for individual students. (2 cred.; sr., grad.; prereq. 10 cred. in ed.)

AGRICULTURAL ENGINEERING

Students in Technical Agriculture may take their major or minor in the field of agricultural engineering. The field embraces the practical phases of technology as applied to agriculture, including farm machinery and power, farm structures, drainage and irrigation, soil erosion control, farm home conveniences, and rural electrification. Because of the broad scope of the field, those majoring therein are advised to consult with the division for assistance in outlining a program of study.

A Professional Course in Agricultural Engineering is offered jointly with the Institute of Technology. This is a professional course designed to train engineers in the various phases of technology as applied to agricultural practices and industries. Details concerning the professional curriculum are given on page 34.

‡ A fee of \$1 per credit is charged for this course.

Freshman and Sophomore Courses

3. Mechanical Drawing. Materials, instruments and their uses. Lettering, scale reading, conventional symbols, and blue printing. Orthographic projection, pictorial drawing, and farm buildings (Agriculture); or records and plats of surveys, contour, profile, and map tracing (Forestry). (3 cred.; no prereq.)
5. Farm Structures Laboratory. Laboratory practice and study of farm building construction with different types of materials. (3 cred.; prof. agr. eng. only; no prereq.)
6. Farm Buildings. Arrangement, planning and construction of farm buildings. Selection and use of building materials, tools and equipment. Laboratory practice in drawing, woodworking and carpentry. (4 cred.; no prereq.)
11. Applied Mathematics. Combination higher algebra and trigonometry. Includes graphing, logarithms, series, proportions, variations, and investments. Rules of practical mathematics with special attention to formulas and problems directly related to agricultural and forestry work. (5 cred.; prereq. high school elementary algebra and plane geometry or their qualitative equivalent)
12. Agricultural Machinery. Machinery as a factor in agricultural production; development, construction, and operation. (3 cred.; prereq. 23 or equiv.)
13. Gas Engines and Tractors. Lecture and laboratory dealing with the theory, operation, adjustment, and use of internal combustion engines in agriculture. (3 cred.; no prereq.)
14. Farm Power and Machinery. Farm power and machinery as factors in agricultural production. Theory, management, and use of internal combustion engines, tractors, and farm machines. (4 cred.; prereq. 41 and 23 or equiv.)
15. Electricity in Agriculture. Elementary theory of electrical circuits and instruments. A study of the application of electrical energy to agricultural processes. Selection and maintenance of equipment. (2 cred.; prereq. 23 or equiv.)
18. Agricultural Automotives. Principles of internal combustion engines and tractors including ignition, lubrication, carburetion, cooling, real gas cycles, transmission systems, and drive members. (4 cred.; prof. agr. eng. only; prereq. Phys. 7)
19. Elementary Surveying. Use of tape, level, transit, and traverse board in agricultural and forestry field problems, e.g., mensuration surveys, traverses, differential and profile leveling; plotting and mapping. Care and adjustment of instruments. (3 cred.; prereq. 3, 11 or trigonometry)
20. Advanced Surveying. Topographic surveys by stadia and other methods, running simple curves, cross sectioning, plotting the survey, profile building, grade determination, and figuring of quantities in earthwork. (3 cred.; prereq. 19)
21. Elements of Surveying. Use of tape, level, transit, traverse board in differential and profile leveling, cross sectioning, running tangents, and simple curves, topographic and agricultural surveys. Mapping, calculation of earthwork, and adjustments of instruments. (5 cred.; prof. agr. eng. only; prereq. Draw. 3, M.&M. 12)
23. General Physics. The elements of physics for those who have not had physics in high school. Mechanics, heat, light, and electricity with laboratory work. (5 cred.; no prereq.)
24. Agricultural Physics I. An applied course involving lectures and laboratory work in mechanics and heat. (4 cred.; prereq. Math. 6 or equiv.)
25. Agricultural Physics II. A practical lecture, recitation, and laboratory course on electricity and light. (4 cred.; prereq. 24)
31. Principles of Drainage. Elementary principles and practice of soil erosion control and of drainage in relation to plant growth, crop and land values, and farm operation and development. (3 cred.; no prereq.)

32. Elements of Supplemental Irrigation. A study of the place and purpose of supplemental irrigation in humid regions. Systems and methods, plans of layouts, costs and return therefrom. (2 cred.; no prereq.)
33. Introduction to Soil and Water Control. Use of engineer's level and tape. General information relative to the subdivision of land. General principles and practices of farm drainage and soil erosion control practices. (3 cred.; prereq. 11 or equiv. and Soils 5)
35. Household Physics. Lectures, laboratory exercises, and experimental demonstrations of selected principles in physics, with special attention to those involved in household appliances and processes. (5 cred.; no prereq.)
37. Rural Sanitation and Water Supply. Wells, pumps, and water supply. Methods of securing sanitary water systems for farmsteads and rural institutions. Sanitary sewage disposal methods for homes, creameries, etc. (3 cred.; no prereq. for agr. section; M.&M. 129 for eng. section)
38. Farm Water Supply and Sewage Disposal. Principles of domestic sewage disposal and farm water supply and distribution. (2 cred.; no prereq.)
40. Mechanical Training. Instruction and laboratory practice in rope work, belts and lacings, cement work, tempering cold chisels and punches (or leather sewing and riveting), sheet metal projects, and cold metal projects. (3 cred.; no prereq.)
41. Metal Work. Instruction and laboratory practice in soldering, electric wiring, pipe fitting, drilling, use of taps and dies, riveting, oxyacetylene welding, brazing, cutting, and electric arc welding. (3 cred.; no prereq.)
- 42.‡ Art Metal Work. Working in mild steel, copper, brass, aluminum, and pewter. Making trays, plates, bowls, candlesticks, bracelets, etc. Use of jeweler's saw; soft soldering; making wooden hammers. (3 cred.; no prereq.)
43. Mechanical Laboratory. Instruction and laboratory practice in mechanical work embracing rope work, belt lacing and pulleys, soldering, welding, pipe fitting, and electric wiring. (3 cred.; prof. agr. eng. only; no prereq.)
44. Advanced Drawing. Plans and pictorial drawings, including perspective, charts, graphs, and co-ordinate plotting on various scales. Mapping. Illustrations for publication. (2 cred.; prereq. Draw. 3 or equiv.)

Junior and Senior Courses

51. Soil Moisture Relations. Soil erosion control. Principles and practices of irrigation and land drainage in relation to plant growth, farm operation, land development, and community interest. (5 cred.; jr. and sr. prof. agr. eng. only; prereq. 21 or parallel, Soils 4, M.&M. 129)
52. Elements of Farm Machinery. Principles of development; construction, and use of agricultural machines. Drawbar power. (3 cred.; prof. agr. eng. only; prereq. M.&M. 26)
53. Farm Structures. Planning and economics of farm structures. (3 cred.; prof. agr. eng. only; prereq. 5, Draw. 3 or equiv.)
67. Advanced Farm Structures Design. Planning, estimating, and designing of farm structures. Study of materials, and equipment commonly used. (3 cred.; prof. agr. eng. only; prereq. 5, 53, M.&M. 128)
70. Dairy Engineering. Construction and principles of operation of refrigerating equipment, steam boilers, and steam equipment and their application to the dairy plant. (3 cred.; jr., sr.; prereq. 24)
71. Design and Economics of Agricultural Machinery. Machine and power costs of farm operations; operating principles and design problems. (3 cred.; prof. agr. eng. only; prereq. 18, 52, M.E. 27)

‡ A fee of \$3 is charged for this course.

72. Applied Electricity. Lectures and laboratory work on topics important in the application of electric power to agriculture, including circuit theory, instruments, farmstead wiring, lighting, motors and controls, and storage batteries. (3 cred.; prof. agr. eng. only; prereq. Phys. 9) (Alternates with Agr. Eng. 73)
73. Steam Boilers and Heat Engines. Steam boilers and heat engines in their applications to agriculture. (3 cred.; prof. agr. eng. only; prereq. 18 and M.E. 31) (Alternates with Agr. Eng. 72)
- 101,102,103. Advanced Problems in Soil Moisture Regulation. Special problems in surface run-off, soil permeability, relation of soil and crop type to soil moisture, shape and regulation of water table in relation to root growth, etc. (2 to 6 cred. per qtr.; sr.; prereq. 51)
104. The Soil Moisture Relation in Agriculture. The scientific basis of soil moisture regulation and conservation in such phases as irrigation, drainage, and soil erosion. Lectures and special problems. (3 cred.; not open to engineers; prereq. 9 cred. in agr. eng. including phys.)
105. Advanced Soil and Water Conservation. Advanced studies of the principles and practices of land drainage, soil erosion control, and irrigation. (3 cred.; sr., grad.; prereq. 51 or equiv.)
- 111,112,113. Farm Building Problems. Investigations in building materials; special designs; methods of construction, costs, and efficiency of farm buildings. (2 to 6 cred. per qtr.; sr.; prereq. 67)
114. Buildings, Equipment, Materials, and Methods of Construction. The relation of structures and building equipment to agriculture. Lectures and special problems. (3 cred.; not open to engineers; prereq. 9 cred. in agr. eng. including 3 or equiv.)
- 121,122,123. Farm Power and Machinery Problems. Studies of mechanical and electrical power and machinery for the farm, including tests, design, and adaptation to various farm conditions. (2 to 6 cred. per qtr.; sr.; prereq. 71 and 72)
124. Agricultural Machinery and Mechanical Power Management. Machinery and power management and use and its cost as a factor of agricultural production. Lectures and special problems. (3 cred.; not open to engineers; prereq. 9 cred. in agr. eng. including phys. and Agr. Eng. 12)
125. Topics in Agricultural Physics. An advanced study of the essential physical principles involved in the utilization of electricity in agriculture. (3 cred.; sr., grad.; prereq. 72 or Calculus and 24, 25, or equiv.)
126. Selection and Management of Agricultural Machinery. Special problems in economical power and machine combinations and their application to the farm. (3 cred.; jr., sr.; prereq. 18, 71, Agr. Econ. 102)

AGRONOMY AND PLANT GENETICS

Students may major in either agronomy or plant genetics. Students in Technical Agriculture may prepare for returning to the farm, farm operators, county agents, seedsmen, or grain dealers. Students in Science Specialization may enter (usually after one or more year's graduate work) the fields of research in agronomy or plant genetics in experiment stations, enter federal service, go into teaching in colleges and universities, or may engage in agronomic or plant breeding research with seed companies.

Recommended courses for major in:

1. **Technical Agriculture:** Agron. 21, 22, 23, 31, 132, 133, 134; Pl. Path. 3, 4; from 3 to 6 credits in other plant science courses may be added with the approval of the adviser.

2. Science Specialization: A major sequence in either agronomy or plant genetics may be arranged in consultation with the major adviser. The courses will be selected in relation to the major interest of the student and may include any courses fundamental to basic training in plant science.

Minor sequence:

Minors should be chosen in consultation with the major adviser. Those in Technical Agriculture usually should choose a minor in another field of technical agriculture most likely to prepare for the vocational objective.

Students in Science Specialization should choose a minor in a science field related to the interests of the student.

Freshman and Sophomore Courses

1. General Farm Crops. A study of the important field crops of the United States. (3 cred.; no prereq.)
21. Grain Crops. Structure, function, culture, improvement, and uses of corn, wheat, oats, barley, rye, flax, and buckwheat. (4 cred.; soph., jr., sr.; prereq. 1)
22. Grain and Hay Grading. Development of grades, study of grading methods, and actual practice in grading grain and hay samples according to federal standards. Training in judging grain and hay on quality basis. (3 cred.; soph., jr., sr.; prereq. 1)
23. Forage Crops. Methods of obtaining stands, stage of maturity of cutting or grazing in relation to continued productivity, yields and quality of product. Hay and silage makings and storage. (4 cred.; soph., jr., sr.; prereq. 1)
31. Principles of Genetics. Fundamental principles of breeding, heredity, variation, biometry, and evolution. (4 cred.; soph., jr., sr.)

Junior and Senior Courses

124. Problems in Farm Crops. Through the use of the problem method, the student is given opportunity to deal with important phases of agronomy. (3 cred.; jr., sr.; prereq. 1, 31, and at least two courses from 21, 23, 132, 134. Seniors and special students may register in the course with approval of instructor.)
126. Crop Judging. Identification of crops, weeds, and diseases in relation to judging and grading farm crops. (4 cred.; jr., sr.; prereq. 22)
132. Farm Crops Plant Breeding. Applied genetics. Methods of breeding each of the important agricultural crops. (4 cred.; jr., sr.; prereq. 31)
133. Pasture Crops and Management. Characteristics, economic value, and distribution of pasture plants. Methods of obtaining stands. Management of temporary and permanent pastures to maintain and improve production. (4 cred.; jr., sr.; prereq. 23)
134. Seminar in Agronomy. Critical studies of problems in agronomy. (2 cred.; sr.; prereq. Agron. 9 cred.)

ANALYTICAL CHEMISTRY

INSTITUTE OF TECHNOLOGY

SCHOOL OF CHEMISTRY

Freshman and Sophomore Courses

- 1†-2‡ Quantitative Analysis. (10 cred.; soph., jr., sr.; prereq. Inorg. Chem. 13)

For additional courses and course descriptions see the Bulletin of the Institute of Technology.

† A fee of \$2 per quarter is charged for this course. The student should purchase a \$5 chemistry deposit card from the bursar, in the Administration Building. No student will be assigned a desk in the laboratories until he presents this card. The \$2 course fee, laboratory material, and breakage will be charged against this deposit.

ANIMAL AND POULTRY HUSBANDRY

Major specialization in this division is elected by students who are chiefly interested in the production, marketing, processing, or distribution of livestock and its products. Vocational opportunities cover a wide range from the raising of livestock and poultry on farms to the distribution of products through retail channels. There are opportunities for graduates in the education field, such as county agricultural agent positions, teachers and research workers in colleges and experiment stations and with business firms. Majors are offered in either animal husbandry or poultry husbandry.

Recommended courses for majors in:

A. **Animal Husbandry**

1. **Technical Agriculture:** An. Husb. 3-4, 5, 51, 52, 53, 56-57, 58, 101, 112, 113; Vet. 50, 51, 52; Agron. 23, 31, 133; Agr. Biochem. 6; Agr. Econ. 40, 143.
2. **Science Specialization:** Consult adviser.

B. **Poultry Husbandry**

1. **Technical Agriculture:** Poult. Husb. 1, 51, 52, 53, 54, 102; Vet. 109; Agr. Biochem. 6; Agr. Econ. 25, 40; 12 credits from the following: Agricultural Economics, Agricultural Biochemistry, Animal Husbandry.
2. **Science Specialization:** Consult adviser.

ANIMAL HUSBANDRY

Freshman and Sophomore Courses

1. **Livestock Production.** Opportunities and problems in livestock production. A survey of practices followed in the production of beef cattle, sheep, swine, and horses. Lectures and laboratory practice in classifying and appraising livestock. (4 cred.; no prereq.)
- 3-4. **Breeds of Livestock.** The origin, history, characteristics, and economic importance of the breeds of livestock. Factors for consideration in the selecting of breeding animals. (6 cred.; soph., jr., sr.; prereq. 1)
5. **Livestock Judging.** Practice in judging beef and dual-purpose cattle, sheep, hogs, and horses. (3 cred.; soph., jr., sr.; prereq. 3-4)

Junior and Senior Courses

51. **Meat Selection.** Lectures on the characteristics of meats from different animals. Meat classification, grading, and utilization; the physical and chemical composition of meat. (3 cred.; jr., sr.; prereq. 1)
52. **Meats.** Slaughter of animals and the cutting of carcasses. Lectures, demonstrations, and laboratory; meat judging practice. (3 cred.; jr., sr.; prereq. 1, 51)
53. **Advanced Meats.** The relation of animal form to carcass yield. The commercial wholesale and retail meat cuts. Factors affecting the quality of meat. Meat products. (3 cred.; jr., sr.; prereq. 52)
54. **Utilization of Meats.** A study of the different cuts of pork, beef, veal, mutton, and lamb with reference to prices, relative economy, uses, nutritive value, chemical composition, ripening, curing, and palatability. Meat products. (3 cred.; jr., sr.; home econ. students; no prereq.)
- 56-57. **Livestock Feeding.** A study of the nutritional requirements of farm animals and the composition and characteristics of livestock feeds. The value of individual feeds and of combinations of feeds for beef cattle, sheep, swine, and horses. (6 cred.; jr., sr.; prereq. 1)

58. Market Classes and Grades of Livestock and Livestock Products. A study of the market classes and grades of livestock and livestock products. Marketing methods; transportation problems; stockyards management; sanitary regulations; buying and selling animals for breeding use; visits to the South St. Paul livestock market and wool warehouses. (3 cred.; jr., sr.; prereq. 1)
101. Livestock Selection. Competitive selection of all types and breeds of livestock. Evaluation of pedigrees, performance records, and other factors as aids to observation in selecting breeding animals. Visits to stock farms. (3 cred.; jr., sr.; prereq. 5)
107. Meat Problems. The wholesale cuts and grades of meat; the processing industry and the utilization of by-products. Special problems and visits to processing and merchandising establishments. (3 cred.; jr., sr.; prereq. 53)
108. Seminar, Animal or Poultry Husbandry. Special problems and preparation of reports on research investigations pertaining to the livestock or poultry industry. (3 cred.; jr., sr.; prereq. 56-57, 112 or poultry 53, 102)
112. Animal Breeding. The application of the physiology of reproduction and genetics to the breeding of farm animals. (3 cred.; jr., sr.; prereq. Agron. 31)
113. Livestock Management. A study of the management principles involved and the problems of care in each of the several types of specialization in livestock production. A general course covering beef cattle, sheep, hogs, and horses. (3 cred.; jr., sr.; prereq. 56-57, 112)
114. Artificial Insemination. Lectures and laboratory on the fundamentals and technics involved in artificial insemination. Problems and procedures in managing artificial breeding associations. (5 cred.; jr., sr.; prereq. 112 and approval of instructor)
116. Prenatal Development of Farm Animals. Textbook, lectures, and demonstration dealing with prenatal development in farm animals. (3 cred.; jr., sr., grad.; prereq. 112 or equiv. and approval of instructor)

POULTRY HUSBANDRY

Freshman and Sophomore Courses

1. Poultry Production. An introduction to the poultry industry and the principles underlying farm flock management. (4 cred.; soph.; no prereq.)

Junior and Senior Courses

51. Hatchery Management. Principles of incubation, study of commercial incubators and problems of hatchery operation and flock improvement. (3 cred.; jr., sr.; prereq. 1, Zool. 14-15)
52. Poultry Judging. Practice in selection for standard and production qualities of poultry. (3 cred.; jr., sr.; prereq. 1)
53. Poultry Feeding. The nutritive requirements of poultry and how they are met by the various feeds and systems of feeding. (4 cred.; jr., sr.; prereq. 1)
54. Poultry Products. A study of grades and classes of market poultry and eggs, methods of processing and storage, and problems in produce plant operation. (4 cred.; jr., sr.; prereq. 1)
102. Poultry Breeding. The application of the principles of genetics and physiology of reproduction to the breeding of poultry. (3 cred.; jr., sr.; prereq. 1, Agron. 31)

ANTHROPOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Freshman and Sophomore Courses

40. Introduction to Anthropology. (5 cred.; soph., jr., sr.; no prereq.)
41. Introduction to Anthropology. (5 cred.; soph., jr., sr.; no prereq.)
42. The Growth of Cultures. (5 cred.; fr., soph., jr., sr.; no prereq.)

Junior and Senior Courses

54. Social Organization. (3 cred.; jr., sr.; no prereq.)
 56. Primitive Science. (3 cred.; jr., sr.; no prereq.)
 80. The American Indian. (3 cred.; jr., sr.; no prereq.)
 81. Archeology of North America. (3 cred.; jr., sr.; no prereq.)
 105. Elements of Language. (3 cred.; jr., sr., grad.; no prereq.)
 106. European Prehistory. (3 cred.; jr., sr., grad.; no prereq.)
 110. Physical Anthropology. (3 cred.; jr., sr., grad.; no prereq.)
 116. Indians of the Southwest. (3 cred.; jr., sr., grad.; no prereq.)
 118. Indian Civilizations of Mexico and Peru. (3 cred.; jr., sr., grad.; no prereq.)
 119. The Contact of Cultures. (3 cred.; jr., sr., grad.; no prereq.)
 120. Indians of the Plains. (3 cred.; jr., sr., grad.; no prereq.)
 122-123-124. Problems in Anthropology. (Cred. ar.; jr., sr., grad.; prereq. permission of instructor)
 130-131-132. Races and Cultures of Arabia, Egypt, and North Africa. (9 cred.; jr., sr., grad.; no prereq.)
 133-134. Races and Cultures of the Far East. (6 cred.; jr., sr., grad.; no prereq.)
 135-136-137. Cultural History of Egypt from the Earliest Times to the Sixteenth Century A.D. (9 cred.; jr., sr., grad.; prereq. permission of instructor and a B average in the student's major subject)
 140. Field Trip in Archeology. (1-8 cred.; jr., sr., grad.; no prereq.)
 150-151-152. Selected Readings in Ancient History. (The same as Hist. 150-151-152) (9 cred.; sr., grad.; prereq. consent of instructor)
 161. Primitive Religion. (3 cred.; jr., sr., grad.; no prereq.)
 163. Ethnology of India. (3 cred.; jr., sr., grad.; no prereq.)
 165. Psychological Phases of Culture. (3 cred.; jr., sr., grad.; no prereq.)
 166. History of Anthropological Theory and Method. (3 cred.; jr., sr., grad.; no prereq.)
 167. Primitive Mythology. (3 cred.; jr., sr., grad.; no prereq.)
 168. Ethnology of Australia. (3 cred.; jr., sr., grad.; no prereq.)
 169. Peoples of the South Seas. (3 cred.; jr., sr., grad.; no prereq.)
 170. Primitive Art. (3 cred.; jr., sr., grad.; no prereq.)

ARCHITECTURE

INSTITUTE OF TECHNOLOGY

COLLEGE OF ENGINEERING AND ARCHITECTURE

Junior and Senior Courses

- 51-52-53. History of Architecture. (The same as Fine Arts 51-52-53) (9 cred.; jr., sr.; prereq. grad. standing)
 57-58-59. Building Materials and Methods. (6 cred.; jr., sr.; no prereq.)
 61-62-63. Tutorial Work in History of Architecture. (The same as Fine Arts 61, 62, 63) (6 cred.; jr., sr.; prereq. 53)
 DP-I.‡ Drawing and Painting, Grade I. (6 cred.; all; no prereq.)
 DP-II.‡ Drawing and Painting, Grade II. (6 cred.; soph., jr., sr.; prereq. DP-I)
 DP-III.‡ Drawing and Painting, Grade III. (6 cred.; jr., sr.; prereq. DP-II)
 AD-I.‡‡ Architectural Design, Grade I. (10 cred.; soph., jr.; no prereq.)
 AD-II.‡‡ Architectural Design, Grade II. (15 cred.; jr., sr.; prereq. AD-I)

‡ A fee of \$1 per quarter is charged for this course.

‡‡ A fee of \$2 per quarter is charged for this course.

SD-I. Stage Design. (4 cred.; jr., sr.; no prereq.)

4-5-6. Graphic Representation. Projection, shades and shadows, perspective, etc. (6 cred.; soph.; prereq. solid geometry)

For additional courses and course descriptions see the Bulletin of the Institute of Technology.

ART EDUCATION

COLLEGE OF EDUCATION

Freshman and Sophomore Courses

1-2-3.* Fundamental Experiences in Design. (9 cred.; all; prereq. high school art or 17-18-19.)

20-21-22. Fundamental Experiences in Design—Continued—Color in relation to hand-crafts and their uses in recreation and rehabilitation. (3 cred. each; prereq. 1-2-3 or evidence of fitness)

4-6-8.* Basic Drawing. (2 cred. each; all; no prereq.)

24-26-28.* Drawing and Painting. (2 cred. each; prereq. Art Ed. 8 or equiv.)

Senior College Courses

150-151. Understanding Contemporary Design. An advanced course with execution of problems leading to a wider understanding of art in commerce and industry. (3 cred.; prereq. 1-2-3 or evidence of fitness)

153. Art Movements of Twentieth Century Scandinavia. (3 cred.; evidence of fitness)

154. Personality and Its Expression in Costume. Experiments in reorientation of personality and various means for esthetic expression of achieved integration. (3 cred.; evidence of fitness)

For additional courses and course descriptions see the bulletin of the College of Education.

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

Freshman and Sophomore Courses

53.†† General Bacteriology. (5 cred.; soph. with a C average in the prerequisite courses, jr., sr.; prereq. 10 cred. in chem. and 4 cred. in bot. or zool.)

Junior and Senior Courses

103. Soil Microbiology. Studies of the microscopic inhabitants of the soil, their inter-relationships and role in the transformations of soil constituents with particular emphasis on the cycles of carbon, nitrogen, and sulphur in nature. (5 cred.; jr., sr., grad.; prereq. 53, and 15 cred. in chem.)

104. Sanitary Bacteriology. (4 cred.; jr., sr., grad.; prereq. 53, and 15 cred. in chem.)

114. Molds, Yeasts, and Actinomycetes. (4 cred.; jr., sr., grad.; prereq. 53 or 101)

121-122.† Physiology of Bacteria. (6 cred.; jr., sr., grad.; prereq. 53 and 8 cred. in org. chem. or biochem.)

123. Applied Bacteriology. (3 cred.; jr., sr., grad.; prereq. 121-122)

* In registering consult Art Education advisers.

† To receive credit for any part of this course a student must complete the parts preceding the dagger.

†† Microscope required. Use of microscope may be obtained by purchasing \$1.50 microscope card from bursar, Main campus.

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Freshman and Sophomore Courses

- 1‡-2‡-3‡ General Botany. (10 cred.; all; no prereq.)
 4‡-5‡ General Botany (10 cred.; all; no prereq.)
 10. Minnesota Plant Life. (3 cred.; all; no prereq.)
 12. Plants Useful to Man. (3 cred.; all; no prereq.)

Junior and Senior Courses

- 50.‡ General Plant Ecology. (3 cred.; soph. with grade of C in 1-2-3 or 4-5; jr., sr.; prereq. 1-2-3 or 4-5)
 51.‡ General Plant Physiology (3 cred.; soph. with grade of C in 1-2-3 or 4-5; jr., sr.; prereq. 1-2-3 or 4-5 and one qtr. of general chemistry or consent of instructor)
 52.‡ Elementary Taxonomy. (3 cred.; soph. with grade of C in 1-2-3 or 4-5; jr., sr.; prereq. 1-2-3 or 4-5)
 53.‡ Morphology of Thallophytes and Bryophytes. (3 cred.; soph. with grade of C in 1-2-3 or 4-5; jr., sr.; prereq. 1-2-3 or 4-5)
 54.‡ Morphology of Pteridophytes and Spermatophytes. (3 cred.; soph. with grade of C in 1-2-3 or 4-5; jr., sr.; prereq. 1-2-3 or 4-5)
 56. Introduction to Mycology. (3 cred.; soph. with grade of C in prereq.; jr., sr.; prereq. 9 cred. in bot. or permission of instructor)
 108. Pteridophytes. (5 cred.; sr., grad.; prereq. 54)
 110. Gymnosperms. (5 cred.; sr., grad.; prereq. 54)
 113‡-114‡-115.*‡ Advanced Taxonomy of Flowering Plants. (9 cred.; jr., sr., grad.; prereq. 52 or consent of instructor)
 118.‡ Extranuclear Cytology. (3 cred.; jr., sr., grad.; prereq. 1-2-3 or 4-5)
 119.‡ Nuclear Cytology. (3 cred.; jr., sr., grad.; prereq. 1-2-3 or 4-5 and an elementary course in genetics)
 120.‡‡‡ Research Methods in Cytology. (3 to 5 cred.; jr., sr., grad.; prereq. 1-2-3 or 4-5 and consent of instructor)
 121.‡ Morphogenesis. (3 cred.; jr., sr., grad.; prereq. 1-2-3 or 4-5 and consent of instructor)
 123.‡‡‡ Research Methods in Histology. (3 to 5 cred.; jr., sr., grad.; prereq. 1-2-3 or 4-5 and consent of instructor)
 127. Anatomy of Vascular Plants. (5 cred.; jr., sr., grad.; prereq. 18 cred. incl. 5)
 131. Field Ecology. (5 cred.; jr., sr., grad.; prereq. 50 or For. 2, 3, 4)
 132.‡ Morphological Ecology. (5 cred.; jr., sr., grad.; prereq. 50 or For. 2, 3, 4)
 133. Ecological Plant Geography. (5 cred.; jr., sr., grad.; prereq. 10 cred. incl. 21)
 134.‡ Research Methods in Ecology. (5 cred.; jr., sr., grad.; prereq. 18 cred. incl. 50)
 137.‡ Experimental Ecology. (5 cred.; jr., sr., grad.; prereq. 18 cred. in plant science incl. 50, 51)
 140. Advanced Survey of Plant Physiology. (3 cred.; jr., sr., grad.; prereq. 51 or equiv. and elem. inorg. chem.)

* Any quarter may be taken separately, except 115, which requires either 113 or 114 as a prerequisite.

‡ A fee of \$1 is charged for this course.

‡‡‡ A fee of \$3 is charged for this course.

141. Physiochemical Principles and Measurements in Plant Physiology. (3 cred.; jr., sr., grad.; prereq. 20 cred. in chem. or biochem. or consent of instructor; for laboratory see 146)
142. Photosynthesis and Other Effects of Radiation. (3 cred.; jr., sr., grad.; prereq. same as for 141; for laboratory see 147)
143. Plant Metabolism. (3 cred.; jr., sr., grad.; prereq. same as for 141; for laboratory see 148)
- 146,††† 147,††† 148.††† Advanced Physiology Laboratory. (2 cred. per qtr.; jr., sr., grad.; to be taken with or after 141, 142, 143 respectively)
- 154.††† Spectroscopy and Photochemistry Applied to Biology. (3 to 5 cred.; jr., sr., grad.; prereq. 20 cred. in chem. or biochem. or consent of instructor)
- 165.‡ Introduction to Pollen Analysis. (3 cred.; jr., sr., grad.; prereq. consent of instructor)
- 197‡-198‡-199.‡ Problems. (1 to 5 cred.; jr., sr., grad.; prereq. consent of instructor)

CHILD WELFARE

Freshman and Sophomore Courses

10. Introduction to Child Study. Survey of the child development nursery school, parent education, and mental hygiene approaches to child study. (2 cred.; 3rd qtr. fr., soph.; no prereq.)

Junior and Senior Courses

80. Child Psychology. Principles, scientific results, and applications to practical problems in education. (3 cred.; jr., sr.; prereq. Psy. 1-2)
90. Home, School, and Family Relations. Adjustment within and outside the family; relation of adults and children; family problems in discipline, recreation, marital adjustment, community relations, etc. (2 cred.; jr., sr.; prereq. 80)
130. Motor, Linguistic, and Intellectual Development of the Child. Lectures, readings, and reports. (3 cred.; sr., grad.; prereq. 12 cred. in psy. or equiv.)
131. Personality, Emotional, and Social Development of the Child. Lectures, readings, and reports. (3 cred.; sr., grad.; prereq. 12 cred. in psy. or equiv.)
132. Later Childhood and Adolescence. Growth, social adjustment, emotional, mental, and personality development. (3 cred.; prereq. 40 or 80 or equiv.)
- 133-134-135. Research Methods. Survey of methods used in the study of personality throughout the developmental period. Practical exercises and problems. (2, 4, or 6 cred.; sr., grad.; prereq. 10 cred. in psy. or ed. psy., and Ed. Psy. 60, or Biom. 101, and permission of instructor)
140. Behavior Problems in Younger Children. Nature and origin of behavior difficulties in younger children with special reference to the relation between early behavior and later maladjustment. (2 cred.; sr., grad.; prereq. 12 cred. in psy., ed. psy., or soc.)
141. Behavior Problems in Older Children. Nature and origin of behavior difficulties in older children, with particular reference to readjustment at time of adolescence. (2 cred.; sr., grad.; prereq. 12 cred. in psy., ed. psy., or soc.)
142. Psychology of Atypical Children. Survey of scientific literature on children with mental and physical handicaps. (3 cred.; prereq. 10 cred. in psy. or equiv.)
- 150-151-152. Childhood Education. Lectures and readings on philosophy, organization, administration, materials and methods. (2, 4, or 6 cred.; prereq. 12 cred. in educ. or equiv.)

‡ A fee of \$1 is charged for this course.

††† A fee of \$3 is charged for this course.

170. Parent Education. History and survey of programs, materials, methods. Administration and organization. Lectures, discussions, and reports. (3 cred.; sr., grad.; prereq. 15 cred. in child welfare or home econ., or ed., or psy., or soc., or pub. health)
185. Children in the War and Postwar Period. Effect of war and social stress upon children. Special problems of care and education. Postwar problems of reconstruction and rehabilitation. (3 cred.; sr., grad.; prereq. 12 cred. in psy., educ. or soc.)
190. Principles of Mental Measurement of Young Children. Survey of mental testing from the point of view of those who interpret test results, the teacher, social worker, etc. Lectures, demonstrations, readings, and reports. (2 cred.; sr., grad.; prereq. 12 cred. in psy., ed. psy., or soc.)

DAIRY HUSBANDRY

The Dairy Production Curriculum is suggested for those students interested in dairy cattle in preparation for (1) dairy farming, (2) technical and extension work pertaining to dairy cattle or dairy farming, and (3) additional graduate study in this field.

The Dairy Products Curriculum is suggested for students interested in the manufacture or distribution of dairy products, either (1) as a plant operator, (2) in technical or extension work in this field, (3) for graduate study in some phase relating to the dairy industry.

1. Technical Agriculture: Recommended courses for majors in:

Dairy Production: Agr. Biochem. 6; Agr. Econ. 40, 80, 102, 103, 104; Agr. Eng. 40; Agron. 21, 23, 31; An. Husb. 3-4, 112, 113; Dy. Husb. 2, 51, 101, 103, 104, 105, 106, 116, 117; Geol. 8; Pl. Path. 1; Poult. Husb. 1; Soc. 1; Vet. 50-51-52.

Dairy Products: Agr. Biochem. 6, 101, 102, 103; Agr. Econ. 25, 40, 50, 131, 140, 141; Agr. Eng. 24, 25, 40, 41, 70; Dy. Husb. 2, 3, 4, 10, 51, 101, 105, 106, 110, 111, 112, 113, 114, 115; Econ. 28.

2. Science Specialization: Consult adviser.

Freshman and Sophomore Courses

1. Elements of Dairying. Lectures and demonstrations with opportunity for laboratory practice. The history and development of the dairy industry. The origin and classification of domesticated cattle. History and characteristics of the dairy breeds of cattle. Milk, its composition, food value, chemical and physical properties with relation to the handling of milk, sanitary milk production and the manufacture of milk products. Dairy arithmetic. Two trips to dairy plants are required. (3 cred.; prereq. entrance cred. in chem. or Inorg. Chem. 1 or 4)
2. Dairy Bacteriology. Lectures and laboratory exercises. Types of milk organisms; the contamination of milk and how prevented; relation of milk to the public health; the bacteriology of dairy products. (3 or 5 cred.; 3 cred. for lect., 2 cred. for lab.; soph., jr., sr.; prereq. Bact. 53) (Lecture taken separately only on permission of instructor)
3. Testing Dairy Products. The use of the Babcock test and other tests common to dairy products plants. (2 cred.; prereq. 1)
4. Dairy Products Practice. A study of factory methods. Includes a minimum of one month's practical experience in a plant handling dairy products in a factory way. Reports and records of work done required. (3 cred.; soph., jr., sr.; prereq. 1)
9. Dairy Cattle Judging. A study of the type and breed characteristics of dairy animals and the relation of form to function in the dairy cow. (1 cred.; soph., jr., sr.; no prereq.)

10. Dairy Products Judging. Laboratory practice in the grading of milk and milk products including cream, ice cream, cheese, butter, and concentrated milks. (1 cred.; soph., jr., sr.; prereq. 1)
20. Household Microbiology. (Especially for students in Home Economics). The fundamental principles of microbiology, characteristics of bacteria, yeasts, molds, and other micro-organisms, their importance in the preparation and preservation of foods, relation to health and well-being of the individual and the family, and sanitation in the home and the community. (4 cred.; 3rd qtr. fresh., soph., jr., sr.; prereq. approval of adviser and permission of instructor)

Junior and Senior Courses

51. Market Milk. Lectures and laboratory work. Classes of market milk; transportation and distribution; sanitary inspection; equipment and operation of plants; problems of public control. (3 cred.; jr., sr.; prereq. 1, 2)
101. Milk Production. Problems of the dairy farmer, such as characteristics and adaptation of dairy breeds; selection and management of dairy herd and size; calf raising, dairy barns. (5 cred.; jr., sr.; prereq. 1)
103. Dairy Stock Feeding. Application of principles of nutrition to feeding the dairy cow and growing young animals. Feeding standards; characteristics of various feeding stuffs; formulation of rations. (3 cred.; sr.; prereq. 101, An. Husb. 56)
104. Dairy Stock Selection. Selection by type; pedigree, and production records. (2 cred.; jr., sr.; prereq. 9, 101 or parallel)
105. Seminar I. Special investigation and study of selected topics. Study of dairy literature. Preparation of bibliographies. Each student presents papers and reports on assigned subjects and reviews recent scientific investigations in dairy husbandry. (1 cred.; sr.; prereq. 3 courses in dairy husb.)
106. Seminar II. Continuation of 105. (1 cred.; sr.; prereq. 105)
110. Dairy Products: Ice Cream and Frozen Desserts. The manufacture of ice cream with special reference to the chemical and physical processes involved. Organization, construction, equipment, and operation of such factories. Laboratory exercises and lectures. (3 cred.; jr., sr.; prereq. 1, 3)
111. Dairy Products: Butter. The manufacture of butter with special reference to the chemical and bacteriological processes involved. Organization, construction, equipment, and operation in such factories. Laboratory exercises to illustrate these processes. (3 cred.; jr., sr.; prereq. 1, 2, 3)
112. Dairy Products: Cheese. The manufacture of cheese, with special reference to the chemical, bacteriological, and physical processes involved. Organization, construction, equipment, operation of such factories. Laboratory exercises and lectures. (3 cred.; jr., sr.; prereq. 1, 2, 3)
113. Technical Control. Lectures and laboratory. Chemical and bacteriological laboratory methods used in technical control of milk and its products. Use of Monjonnier tester, cryoscope, and bacteriological control methods. (3 cred.; sr.; prereq. 2, 111 or 112)
114. Milk By-Products. The manufacture of condensed milk, dry milk, casein, and other milk by-products with special reference to the physical processes involved. Laboratory exercises and lectures. (3 cred.; jr., sr.; prereq. 1, 3)
115. Advanced Dairy Bacteriology. Investigations of specific problems on the bacteriology and mycology of milk and dairy products. (3 cred.; sr.; prereq. 2, 111 or 112)
116. Milk Secretion. Lecture assignments covering the anatomy and physiology of milk secretion and factors influencing the quality and quantity of milk. (3 cred.; sr.; prereq. Physiol. 9 cred. and Agr. Biochem. 103)

117. Dairy Cattle Breeding. Application of the principles of genetics to the improvement of dairy cattle. Evaluation of breeding animals and formulation of breeding plans. (3 cred.; jr., sr.; prereq. 101, 104, Agron. 31)

(For courses in Dairy Chemistry see Agricultural Biochemistry 103, page 70.)

ECONOMICS

SCHOOL OF BUSINESS ADMINISTRATION

For courses and course descriptions see the Bulletin of the School of Business Administration.

See also courses in Agricultural Economics.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

COLLEGE OF EDUCATION

For courses and course descriptions see the Bulletin of the College of Education.

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

For courses and course descriptions see the Bulletin of the College of Education.

ENGLISH

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Freshman and Sophomore Courses

21-22-23.* Introduction to Literature. (15 cred.; all; prereq. Rhet. 1, 2, 3)

37-38-39.§ Twentieth-Century Literature. Readings in British and American literature since the 1890's, arranged by types of discourse. 37f: The literature of opinion, biography, travel, etc., with some reading in the short story; 38w: poetry and drama; 39s: the novel since Thomas Hardy. This course is intended, as a general introduction to the intelligent reading of literature, for students in all colleges, and not particularly for those meaning to specialize in English. (9 cred.; soph., jr., sr.; prereq. Rhet. 1, 2, 3)

For additional courses and course descriptions see the Bulletin of the College of Science, Literature, and the Arts.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Courses in this department are closely correlated with those offered in the Department of Zoology of the College of Science, Literature, and the Arts.

Recommended for majors in entomology: Ent. 5, 14, 51, 52, 55, 64; Pl. Path. 1; Zool. 21, 53, 83.

Recommended minors: agronomy, biochemistry, horticulture, plant pathology.

Whether the chosen curriculum is that of Technical Agriculture or of Science Specialization, major students in entomology are required to take 15 credits in either German or French prior to graduation.

Students wishing to major in economic zoology should consult the special curricula in Wildlife Management (page 20), and in Game Management (page 43).

* Offered on the Minneapolis campus.

‡ Note that in the winter quarter this course is offered at the University Farm.

Freshman and Sophomore Courses

5. Economic Entomology. The life histories, habits, and methods of control of the insect pests of orchard, field, and garden. Laboratory work in the determination of the more important forms. (5 cred.; soph., jr., sr.; prereq. Zool. 14-15 or equiv.)
13. Field Zoology. For forestry freshmen at Itasca Park. (1 cred.; no prereq.)
- 14-15-16. Principles of Beekeeping. History of beekeeping industry. Life history, morphology, physiology, and reproduction of the honey bee. Colony development. Races of bees. Bee equipment. Apiary and shop management. Wintering, disease control. Grading and marketing bee products. (2 to 6 cred.; no prereq.)
- 17-18-19. Beekeeping Practice. Laboratory, shop, and apiary work. External and internal anatomy of honey bee. Assembling equipment. Installing package bees, requeening, making increase. Preparation of combs and extracted honey for market. (1 to 3 cred.; prereq. 14-15 or parallel)
20. Advanced Beekeeping. Special work for students specializing in beekeeping, adapted to the needs of the individual student. (2 to 6 cred.; prereq. 14 to 19 and 5 cred. in ent.)

Junior and Senior Courses

- 51.*†† Introductory Parasitology. An elementary course dealing with parasitic Protozoa, worms, and arthropods and their relation to diseases of man and animals. (5 cred.; jr., sr.; prereq. Zool. 14-15 or equiv.)
- 52.*†† Introductory Entomology. General morphology, life histories, habits, and classification of insects. (5 cred.; jr., sr.; prereq. Zool. 14-15 or equiv.)
55. Entomological Techniques. Practical laboratory instruction in mounting, preservation of insect larvae; preparation of microscopic mounts of minute insects; labeling, classifying, and cataloging specimens of insects for scientific study. (9 hrs. lab., 3 cred.; jr., sr.)
56. Forest Entomology. Lectures and laboratory work dealing with the principles of controlling insects that attack trees and forest products, together with a consideration of the life history and habits of important representative species. (5 cred.; jr., sr.; prereq. Zool. 14-15 or equiv.)
64. Economic Vertebrate Zoology. Lectures and library work. Deals with the various vertebrates of Minnesota, their habits and economic status, and means by which their numbers may be controlled. (3 cred.; jr., sr.; prereq. Zool. 1-2-3 or equiv.)
114. Apiculture. Problems of bee management, disease control, wintering, bee breeding, processing, and marketing bee products. Given in the form of seminar discussion and laboratory and field practice. (3 cred.; jr., sr.; prereq. 9 cred. in ent.)
- 117*†-118†§-119.*† Animal Ecology. General ecology with special reference to the insects of Minnesota. Frequent field trips. Lectures, laboratory, and field work. (9 cred.; jr., sr.; prereq. 15 cred. in zool. or ent.)
120. General Ecology of Insects. Ecology with special reference to insects, their distribution, natural control, and related problems. Lectures, laboratory, and field work. (3 cred.; jr., sr.; alternative to 119, or both may be taken; prereq. 117-118)
- 121.*† Ichthyology. A study of the taxonomy and habits of the fishes of the Upper Mississippi drainage. (3 cred.; jr., sr.; prereq. 15 cred. in zool. or ent.)
- 125†-126†-127.*† Advanced General Entomology. Advanced work in the lines of morphology and classification of insects with lectures on the history of entomology. Lectures and laboratory. (9 cred.; jr., sr.; prereq. 15 cred. in zool. or ent.)

* Offered on the Minneapolis campus.

† Open to sophomores on petition.

‡ A fee of \$1 per quarter is charged for this course.

§ Note that in the winter quarter this course is offered at the University Farm.

- 141-142. Insects in Relation to Plant Diseases. A study of the principal insect vectors and their habits, types of insect injuries affecting health of plants, modes of insect transmission and dissemination of plant diseases, the methods of rearing and handling the carriers. Of interest to students in entomology, plant pathology, horticulture, forestry, and agronomy. (6 cred.; jr., sr.; prereq. 8 cred. in ent. or plant path.)
- 144†-145†-146.*‡ Animal Parasites and Parasitism. Lectures and laboratory work. Origin and biological significance of parasitism; structure, life history, and economic relations of representative parasites. Second term devoted primarily to the relation of insects to diseases of man and animals. (3 to 9 cred.; jr., sr.; prereq. Zool. 9 cred.)
150. Introduction to Aphidology. The biology and taxonomy of Aphididae. (3 cred.; no prereq.)
161. Waterfowl and Upland Game Birds. Life histories, habits, environmental requirements, and management of the North American species of game birds. Lectures, laboratory and field work. (3 cred.; jr., sr.; prereq. Zool. 46-47 or equiv.)
163. Mammalogy. Distinguishing characteristics and life histories of the various mammal groups, particularly those represented in the state. Consideration is given to the possibilities of fur farming in case of certain species. (4 cred.; jr., sr.; prereq. Zool. 22)
165. Wildlife Management. Theory and practice of wildlife management, including a consideration of its history and mechanism; the properties of wildlife populations; the factors that make up wildlife environments; methods of recognizing and measuring these properties and factors; and management measures for the various species. (3 cred.; jr., sr.; prereq. Zool. 1-2-3 plus 10 cred. Zool. or For.)
166. Methods in Wildlife Management. Lectures and laboratory work. Frequent field trips. Use of field data, range mapping, censuses, surveys, preparation of indices and life equation tables, field investigation techniques. (3 cred.; jr., sr.; prereq. 163, 165)
167. Techniques in Forest Wildlife Management. Largely field work; use of censuses applicable to the major local forms of forest wildlife; preparation of a wildlife management plan for a small forested area. (3 cred.; sr.; prereq. Ent. 165. Given at Cloquet)
175. Insecticides and Their Action. A study of the chemical composition, the physical properties, and the physiological action of standard, of little known, and of new insecticides. (4 cred.; sr.; prereq. inorg. and org. chem.)
176. Advanced Economic Entomology. A critical consideration of the principles of insect control and the history of their development. (3 cred.; sr.; prereq. 5 or 56, Zool. 117-118-119 or equiv.)
197. Introduction to Research. Preparation for investigational work in lines of entomology, parasitology, ecology, economic zoology, or beekeeping. Advanced laboratory, field, and library work; training in preparation of bibliographies and manuscripts; special problems. Summer work should be planned when possible. (5 or more cred.; sr.; prereq. work as prescribed by the division)

FORESTRY

Freshman and Sophomore Courses

1. General Forestry. A brief history of the development of forestry in Europe and America; its bearing on the forestry problems of the United States; description of the United States forests. Lectures and collateral reading. (3 cred.; no prereq.)
2. Field Dendrology. Identification of trees and shrubs in Itasca Park. (1 cred.; no prereq. Given at Itasca Park)

* Offered on the Minneapolis campus.

‡ A fee of \$1 per quarter is charged for this course.

- 3-4. Dendrology. The forest trees of the United States; their classification, characteristics, and range. Lectures, assigned reading, laboratory. (Course 3, 3 cred. and Course 4, 4 cred.; no prereq.)
5. Field Silviculture. Largely field work designed to give the student a working knowledge of the forest. Includes silvicultural study of the types found in the north woods and the general principles underlying silvicultural reconnaissance. (1½ cred.; no prereq. Given at Itasca Park)
6. Field Mensuration. Largely field work. Includes use of compass, pacing and mapping; and elementary work in tree measurements, timber cruising, and growth determination. (1½ cred.; no prereq. Given at Itasca Park)
- 7-8-9. Forest Mensuration. The basic principles underlying the determination of the volume of forest products, and trees, stands, and forests; the growth and yield of trees, stands, and forests; and the elementary methods of compiling and analyzing numerical data. (9 cred.; all; prereq. 6, Math. 1 and 6)
10. Farm Forestry. The place of forestry in land-use planning. The economic status of the farm woodlot. The establishment and care of woodlots and windbreaks. Forest influences with special reference to soil erosion control. The use of wood on the farm. (3 cred.; not open to students majoring in forestry; no prereq.)
11. Camp Management. Instruction and experience in camp management. Each student will be placed in charge of the summer camp under faculty supervision for a short period of time. (1 cred.; no prereq. Given at Itasca Park)
20. Grazing. History of grazing in the West. Kind of stock used. Forage plants. Regulations and methods of handling stock on the national forests. Range management and protection. Lectures and reading. (3 cred.; soph., jr., sr.; no prereq.)
49. House and Furniture Woods. The woods used in house construction and interior finish and furniture. Their identification and properties. Lectures and laboratory. (2 cred.; soph., jr., sr.; not open to students majoring in forestry; no prereq.)

Junior and Senior Courses

- 53-54. Wood Structure and Identification. Structure, classification, and identification of the domestic commercial woods. Lectures, reading, laboratory. (6 cred.; jr., sr.; prereq. 3-4)
56. Forest Products. An introductory survey of the products of forests other than lumber, such as naval stores, tannins, wood pulp, paper, etc. Lectures, reading, reports. (3 cred.; jr., sr.; no prereq.)
57. Wood Utilization. Production, distribution, qualities, amounts, and prices of both foreign and domestic hardwoods and softwoods. Lectures, reading, reports. (3 cred.; sr.; prereq. 53-54)
58. Lumber Merchandising and Grading. A study of the lumber industry, lumber associations, lumber grades, lumber prices, and lumber distribution. (3 cred.; sr.; prereq. 53-54)
101. Advanced Dendrology. A continuation of Course 3-4 with special studies in classification and distribution of some important timber species of the world. (3 cred.; jr., sr.; prereq. 3-4)
- 111-112. Advanced Forest Mensuration. Continuation of Course 9 with special emphasis on the application of alinement charts, and statistical methods in forest mensuration. (6 cred.; postgrad.; prereq. 9 or consent of instructor)
113. Wood Pulp and Paper. A detailed study of production of wood pulp and paper products. Lectures, reading, reports. (3 cred.; jr., sr.)
114. Mechanical and Physical Properties of Wood. Derivation and application of the formulas used in determining stresses in wood. Lectures, reading, and class problems. (3 cred.; jr., sr.; prereq. 53-54, Math. 7)

- 115-116. Mechanical and Physical Properties of Wood. Laboratory methods in timber testing. The use of timber connectors in heavy construction. Laboratory, reading, and reports. (6 cred.; jr., sr.; prereq. 114)
119. Advanced Wood Structure. The microtechnique of woody tissues. Lectures, reading, and laboratory work. (4 cred.; sr.; prereq. 53-54)
120. Estimating. A general course in building cost estimating. (3 cred.; sr.; no prereq.)
125. Wood Preservation. Lectures and collateral reading of the history, development, and methods of wood preservation. Different systems now in use and preservatives used. (3 cred.; jr., sr.; prereq. 53-54)
126. Silvics. The fundamentals forming the basis of silviculture with special attention to the silvics of the important tree species. Discussion, reading, and required papers. (3 cred.; postgrad.; no prereq.)
127. Silviculture. A study of the general principles underlying the art of silviculture, and a brief study of European methods as applied to American conditions. (3 cred.; postgrad.)
128. Silviculture Laboratory. Nursery practice and field planting. Preparation of a silvicultural plan for a small tract of timber and the application of that plan. (6 cred.; sr. Given at the Cloquet Forest Experiment Station)
130. Forest Valuation. The business of forest management. A study of the different factors entering into the valuation of forest property. (5 cred.; postgrad.)
131. Forest Policy and Administration. Policy of the United States and the states toward the utilization of the public forest resources. Policy of other owners toward forest resources controlled by them. Administration of the national and state forests. (5 cred.; postgrad.)
132. Forest Regulation Laboratory. Field work. Collection of data necessary for a forest management plan. Includes timber estimating, growth studies, and maps necessary for a forest management plan. (6 cred.; sr. Given at the Cloquet Forest Experiment Station)
136. Forest Economics. The place of the forest in the productive utilization of land; past and present markets and source of supply of timber and timber products, particularly with reference to the present situation in North America. (3 cred.; jr., sr.; prereq. Agr. Econ. 2 and For. 130)
137. Seeding and Planting. Principles of seeding and planting and the nursery practices used in the different forest regions of the United States. (3 cred.; jr., sr.)
140. Forest Management Plans. Methods of regulating and allotting the cut from a forest under management. Preparation of a forest management plan. Lectures and reports. (3 cred.; postgrad.; prereq. 128, 132)
141. Principles of Silvics. Principles underlying the silvical characteristics of trees and the reactions of trees to their environments. (3 cred.; postgrad.; prereq. 126)
142. Wood Chemistry. Wood composition, the constitution of wood components, the reactions of wood components and derivatives, and the analysis and chemical technology of wood and wood products. (3 cred.; jr., sr.; prereq. Org. Chem. 156 and 159, For. 53-54)
143. Forest Recreation. The recreational use of the forest from an economic, sociological, and technical point of view. Administrative and technical problems arising from recreational use. (3 cred.; jr., sr. No prereq.)
144. Forage and Browse Plants. The important forage and browse plants of the United States; their identification, nutritive value, palatability, growth habits, and distribution. Includes a general study of forage types, the classes of forage, carrying capacities, and methods of ecological investigation. (3 cred.; jr., sr., grad.; prereq. Bot. 113 and Pl. Path. 4)

151. Logging. The principles and general methods of logging in the different forest regions of the United States, and the modifications required by forest management. (3 cred.; jr., sr.; no prereq.)
152. Wood Seasoning. Theory and practice of air seasoning and kiln drying of wood. (3 cred.; jr., sr.; prereq. 53-54)
155. Forest Protection. The protection of forests from fire—fire prevention and fire suppression. The causes of forest fires and their elimination, climate and fires, fire fighting and fire legislation. (3 cred.; jr., sr.; no prereq.)
- 220-221-222. Major Report. Independent study and the preparation of a comprehensive report on some phase of general forestry, range management, or game management. (2 cred. per qtr.; grad.)
- 223-224-225. Literature Seminar. Assigned topics with special reference to current forestry problems. Critical and historical review of current forestry literature. (1 cred. per qtr.; grad.)

GENERAL COLLEGE

- 5A-5B. Contemporary Society. (3 cred. per qtr.)
- 6A-6B-6C. Current History. (2 cred. per qtr.)
- 10A†-10B-10C. Human Biology. (3 cred. per qtr.)
- 30A-30B. Literature Today. (3 cred. per qtr.)
- 37A-37B-37C. Physical Science Studies. (5 cred. per qtr.)
- 41A. Practical Applications of Psychology. (5 cred. per qtr.)
- 45A-45B-45C. The United States in World Civilization. (2 cred. per qtr.)
- 46A. The American Citizen and His Government. (3 cred.)
- 46B. The Functions and Problems of Government. (3 cred.)
- 46C. International Relations. (3 cred.)

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Freshman and Sophomore Courses

- 1-2.† General Geology (Dynamic and Historical). (6 cred.; all; no prereq.)
- A†-B.‡ General Geology Laboratory (Dynamic and Historical). (4 cred.; all; with or after 1-2)
- 8.§ Introductory Geology. (5 cred.; all; no prereq.)
- 23†-24.†† Elements of Mineralogy. (8 cred.; soph., jr., sr.; prereq. a course in chem.)

For additional courses and course descriptions see the Bulletin of the College of Science, Literature, and the Arts.

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Freshman and Sophomore Courses

1. Beginning German A. (5 cred.; all; no prereq.)
 2. Beginning German B. (5 cred.; all; prereq. 1 or one year of high school German)
 3. Beginning German C. (5 cred.; all; prereq. 2 or two years of high school German)
 4. Intermediate German. (5 cred.; all; prereq. 3 or three years of high school German)
- 24a-25a-26a.† Chemical German. (12 cred.; no prereq.)

† To receive credit for any part of this course a student must complete the parts preceding the dagger.

‡ A fee of \$1 per quarter is charged for this course.

§ Not open to students who have had Course 1. Does not satisfy the Junior College requirement for science. Cannot be followed by Course 1 for credit. May be followed by Course 2 with instructor's permission.

30-31-32. Medical German. (9 cred.; prereq. 3)

Two options are permitted for requirements in Science Specialization Curriculum: 1-2-3 (15 cred.) or 24a-25a-26a (12 cred.)

For additional courses and course descriptions see the Bulletin of the College of Science, Literature, and the Arts.

HISTORY AND PHILOSOPHY OF EDUCATION

COLLEGE OF EDUCATION

For courses and course descriptions see the Bulletin of the College of Education.

HOME ECONOMICS

Freshman and Sophomore Courses

1. Choice and Care of Clothing. A consideration of the problems involved in the selection, buying, and maintenance of clothing. A study will be made of the characteristics of certain textile materials, and their suitability for various uses. (4 cred.; fr.; not open to seniors or students who have had Gen. Col. 15A; no prereq.)
2. Introduction to Textiles. A study of textiles fibers and their properties as related to fabric properties; yarn and fabric structure and design; problems in the selection of textiles materials for clothing and household furnishings. Laboratory work with representative fabrics. (3 cred.; for S.L.A., Bus. Adm., and Art Ed.; no prereq. Written permission must be obtained from the Junior College office, 106 Folwell Hall)
3. Clothing Construction A. Laboratory practice in planning, cutting, fitting, and applying the suitable techniques in making garments of cotton and rayon fabrics; care and use of sewing machines; interpretation and adaptation of commercial patterns; alteration of garments. (3 cred.; fr.; soph.; prereq. 1)
4. Clothing Construction B. Laboratory practice in costume modeling; preparation of dress form; application of tailored technique to rayon or wool fabrics; garments constructed will include a remodeling problem; problems in renovation and repair. (3 cred.; soph., jr.; prereq. 3, and home practice in clothing construction)
6. Institution Experience. Practical work in all the departments of the cafeteria. Each student works independently under the supervision of the instructor. The course is intended to help the student decide upon her specialization. (3 cred.; fr.; no prereq.; each section limited to 3. For Institution Management majors, consent of instructor)
10. Vocational opportunities in Home Economics. Discussion of personal and educational qualifications for employment in the field of home economics. (2 cred.; 1st qtr. fr. only; no prereq.)
17. Personal and Family Living. The relationships involved in personal and family living, including adjustments for the individual as a student or family member; living in a democratic family, and various specific current problems—situations in the family in preparation for successful marriage and family living. (3 cred.; fr., soph., jr.; no prereq.)
20. Introduction to Related Art. A study of the art problems which are involved in the everyday life of the student. (4 cred.; fr., not open to seniors; no prereq.)
- 21,22. Color and Design, I, II. The principles of color and design related to such problems as selecting and designing costumes and selecting, arranging, and designing house furnishings. (3 cred. for each course; prereq. 20 for 21, and 1 and 20 for 22)
23. Advanced Design. An intensive study of design and its applications. The aim is facility in designing. (3 cred.; soph., jr.; prereq. 21 or 22)

24. Problems in Home Planning and Furnishing. Exteriors and interiors studied for their design and suitability. An analysis of typical floor plans. Problems in selecting, arranging, and conserving household furnishings. (5 cred.; soph.; prereq. 20)
25. Design Applied to Crafts. Principles of design and color harmony applied in various crafts. Articles are planned to relate to definite dress and home furnishing problems. (3 cred.; prereq. 21 or 22)
27. Related Art Problems. Problems worked out relating to costume and house furnishing design. (3 cred.; jr., sr.; prereq. 21)
- 30.*§ Introduction to Nutrition. A course designed for students wishing a discussion of the application of the principles of nutrition to the selection of food. (2 cred.; not open to home econ. students; no prereq.)
31. Introduction to Nutrition. The application of nutrition principles to food selection of college students. Includes typical student problems such as buying meals, and the relation of food to the promotion and maintenance of health. (3 cred.; fr., not open to seniors; no prereq.)
33. Nutrition I. (1) The nature and properties of groups of compounds occurring in the cell and in food, (2) digestion, and (3) absorption. (4 cred.; soph., jr., sr.; prereq. Agr. Biochem. 4, Physiol. 4 or parallel)
34. Nutrition Problems. A consideration of the nutrition problems most commonly met by adults and children in typical families. (4 cred.; 3rd qtr. soph., jr., sr.; prereq. 31, 40, physiol., or human biol.)
35. Nutrition II. A study of tissues and tissue metabolism as well as work on blood, milk, and urine. (4 cred.; soph., jr., sr.; prereq. 33)
40. Food Preparation. The development of technique and the application of fundamental science principles to cookery processes and preservation. The establishment of good standards for food products. (5 cred.; fr. with honor point ratio of 1 or above; prereq. 2 qtrs. chem.)
41. Food Management and Marketing. Determination and study of the management factors involved in the food problems of the homemaker and consumer. A study of the quality, cost, and conservation of foods. Laboratory. (5 cred.; soph., jr., sr.; prereq. 31, 40)
- 45.¶ Quantity Cookery. Application of the principles of cookery to large quantity preparation; planning of meals for dining hall, cafeteria, and tearoom; a study of standardized formulae and production costs. (6 cred.; jr., sr.; prereq. 40)
- 46.¶ Cafeteria Experience. Experience in the minor problems of cafeteria, dining hall, and tearoom administration. (3 cred.; soph., jr., sr.; no prereq.)

Junior and Senior Courses

50. Textiles. A study of textile materials from the standpoint of the consumer; the characteristics of commonly-used fibers and fabrics; textile information as a tool in the selection and maintenance of textile products used for clothing and home furnishing. Laboratory study of selected fabrics. (3 cred.; jr., sr.; prereq. 1)
53. Advanced Clothing. A laboratory course with special emphasis on designing, fitting, and tailoring of a wool costume, including millinery; draping or pattern modification and fitting of a plaid, stripe, or figured fabric. (3 cred.; jr., sr.; prereq. 4, 50 or parallel)
54. Problems in Clothing Construction. A laboratory course to broaden the background of experience in management, construction, and costume design through such prob-

* Offered on the Minneapolis campus.

§ Intended for students in Science, Literature, and the Arts. Open to students in Home Economics only by special permission of chief of division.

¶ Open only to Home Economics students registered in the College of Agriculture, Forestry, and Home Economics.

- lems as illustrative material, draping, fitting, pattern modification, garment alterations; evaluation of construction techniques in clothing made at home or ready-to-wear. (3 cred.; jr., sr.; prereq. 53 or permission of instructor)
- 56A-56B. Applications of Color and Design. The principles of design and color applied to the selection, cost, and arrangement in the fields of costume, dress and household fabrics, and household furnishings. (3 cred. each; not open to home econ. students; no prereq.; courses must be taken in the sequence indicated. Written permission must be obtained from the Junior College office, 106 Folwell Hall)
64. Institution Buying. Problems involved in the purchasing and use of foods and equipment for the institution. (4 cred.; jr., sr.; prereq. 45 and 46—may parallel one or the other)
65. Institution Management Problems. Problems affecting the efficient administration of the institution; departmental organization, operation, maintenance; employment problems; business policies. Field trips to various types of institutions. (3 cred.; jr., sr.; prereq. 45, 46, 64)
70. Advanced Food Preparation. This course involves an intensive study (with laboratory work) of one or more food problems such as the following: cooking meat or fish and poultry; preservation of fruits and vegetables or meats and poultry; cakes; bread. (3 cred.; prereq. Agr. Biochem. 4, H.E. 40)
71. Demonstrations. The aim shall be to familiarize the student with the purposes and techniques of demonstrations in the various fields of home economics with special reference to their application in the field of business. (1 cred.; open to 3rd qtr. jr. and sr.; prereq. 41)
- 76.* Nutrition. The application of the principles of nutrition as applied to special groups. (3 cred.; not open to home econ. students; for nursing students only; prereq. permission of instructor)
- 79.§ Selected Problems for Dietitians. A selected group of problems related to the work of the dietitian involving discussions, assigned readings, and field trips. (3 cred.; jr., sr.; prereq. 170 or equiv.)
85. Home Management: Operation and Maintenance, Lectures. Discussion of the managerial aspects of homemaking with special emphasis upon problems involved in the use of time, energy, and money. (4 cred.; jr., sr.; prereq. 40, H.E. Ed. 90 or parallel)
86. Home Management: Operation and Maintenance, Laboratory. Residence for one-half quarter in a home management house with direct experience in managing the various activities and responsibilities involved in their group-living. (4 cred.; jr., sr.; prereq. 85 or parallel, 40, H.E. Ed. 90, P.H. 52a, b)
98. Home Economics Extension. Study of the objectives, organization, and functioning of home economics extension service in Minnesota and elsewhere. Observation of work in the Twin Cities. Discussion and conferences. (3 cred.; sr.; prereq. H.E. Ed. 91 or parallel)
102. Advanced Textiles. An intensive study of textile materials with special reference to the following: nature of the raw materials; economic, chemical, and physical applications involved in their manufacture and use; methods and significance of physical testing. (3 cred.; jr., sr.; prereq. 50, Agr. Biochem. 4, Agr. Econ. 3 or parallel)
107. Textile Analysis. Problems and application of quantitative methods in textile analysis with special reference to informative labeling and to statements concerning fiber composition of fabrics. (3 cred.; jr., sr.; prereq. 102, Agr. Biochem. 2)

* Offered on the Minneapolis campus.

§ Open only to Home Economics students registered in the College of Agriculture, Forestry, and Home Economics.

115. Economic and Social Aspects of Clothing. Trends in clothing consumption, clothing expenditure patterns, clothing budgets for low-income and dependent groups, motivation in dress, the sociological and economic aspects of fashion in dress, the ready-to-wear industry. (3 cred.; jr., sr.; prereq. 50, Agr. Econ. 3)
116. Family Clothing Problems. The buying of clothing, governmental controls of clothing productions; the simplification of clothing, the labeling and standardization of clothing, the sizing of garments and patterns, recent developments in the choice of clothing for specific uses such as work clothing and clothing for infants and children. (3 cred.; jr., sr., prereq. 27, 50)
120. Art History and Appreciation. The historical development of painting, sculpture, architecture, decoration, furniture, and costumes, studied with special emphasis on design and influence upon modern styles. (3 cred.; Senior College and grad. only)
121. Textile Design. A study of historic and modern textile designs with special reference to the technique and materials employed in their production and to their adaptations for present-day use in the home and in dress. (3 cred.; jr., sr.; prereq. 27, 50)
122. Advanced Interior Design. Special problems of small house interiors involving execution of elevation drawings. Studies and reports on topics of practical and historical interest. Actual materials will be used as far as possible. (3 cred.; jr., sr.; prereq. 27, 120 or permission of instructor)
125. Advanced Costume Design. Relation of color and texture to dress design. Study of figure construction. Studies and reports on assigned topics. Laboratory work with fabrics. Designs in pencil and water colors. (3 cred.; jr., sr.; prereq. 4, or permission of instructor; 22 recommended)
- 142.§ Experimental Cookery. An intensive study of problems in foods and food preparation with individual laboratory problems. (3 cred.; jr., sr.; prereq. 40, Agr. Biochem. 4)
- 146.§ Special Food Problems. Class problems in foods and food preparation. (3 cred.; sr.; prereq. 142)
170. Nutrition of the Family. The fundamental principles of human nutrition and their application in the promotion and maintenance of optimal health of the family. (3 cred.; jr., sr.; prereq. 31, 40, Agr. Biochem. 4, Physiol. 3 cred.)
171. Child Nutrition. Lectures, discussions, and field work dealing with the principles of child nutrition and with the formation of desirable food habits. (3 cred.; jr., sr.; prereq. 170, H.E. Ed. 90)
- 173.§ Nutrition in Disease. A study of the fundamental principles involved in using diet in the treatment of certain diseases. (4 cred.; jr., sr.; prereq. 170; 35 also advised)
176. Advanced Nutrition. Selected quantitative methods applicable to investigation relating to digestion and metabolism. (4 cred.; jr., sr.; prereq. 35 or parallel, Agr. Biochem. 2)
177. Digestion and Metabolism. An intensive study of problems relating to digestion and metabolism involving lectures, readings, and laboratory work. (3 cred.; jr., sr.; prereq. 35)
- 178.§ Clinical Problems in Nutrition. The application of nutrition information to problems in health and disease involving assigned readings, discussions, and experience in a clinic. (2 cred.; jr., sr.; prereq. 170, 35 or parallel)
179. Readings in Nutrition. A course designed to give intensive experience in the use of nutrition books and periodicals, involving assigned readings, oral and written reports. (2 cred.; jr., sr.; prereq. 170)
180. Home Planning and Furnishing. Problems in selecting a home and prolonging the life of the house and its furnishings. Stresses intelligent planning and furnishing of

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the home on the basis of family living. (5 cred.; jr., sr.; prereq. 27; 120 recommended)

185. Family Relationships. A study of the factors that promote satisfaction within the immediate family and for the family in relation to the community. (2 cred.; jr., sr., grad.; prereq. 86 or parallel, H.E. Ed. 90)
186. Problems in Income Management. An intensive study of problems relating to individual and family budgets. Readings, discussions, and field work. (3 cred.; prereq. 85 or parallel, 86 or parallel, 34 or equiv., Agr. Econ. 126 or parallel)

HOME ECONOMICS EDUCATION

COLLEGE OF EDUCATION

Junior and Senior Courses

90. Child Training. A brief study of the physical and mental development of the child is followed by a discussion of the problems of training small children. Emphasis is placed on the preschool child. Lectures, observations in the Nursery School, and reports. (3 cred.; soph., jr., sr., prereq. Psy. 1-2)
- 91.† Observation, Materials, Teaching in Home Economics. The psychological bases for teaching; investigation and collection of facts on teaching situations through observation and participation in school activities; study of teaching materials and method. (5 cred.; jr., sr.; prereq. H.E. 4, 41; Psy. 1-2; Ed. 51A, 51C; parallel H.E. Ed. 93 and 192, home experience*)
92. Teaching Problems in Home Economics. Reports, discussion, conferences on the planning of units, teaching procedures, illustrative materials, and equipment. (2 cred.; sr.; prereq. H.E. Ed. 91, 93 parallel; H.E. Ed. 94 and 192)
- 93-94.‡ Supervised Teaching in Home Economics. Observation, participation, and actual teaching experience under supervision in different home economics situations and on different age levels. (6 cred.; jr., sr.; prereq. H.E. 4, 41; Psy. 1-2; Ed. 51A, 51C; parallel H.E. Ed. 91. Students must have received a grade of C or higher in H.E. 3, 4, 21, 22, 40, 41, and must have completed home experience* in foods, clothing, and other phases of home economics.)
95. Field Experience for Home Demonstration Agents. Observation, participation, and actual experience under supervision in the agricultural extension program. This experience includes a study of the program at University Farm and participation in a selected county program with a home demonstration agent. A written report summarizing the experience will be required. (6 cred.; permission of the head of Home Economics Education and the director of Agricultural Extension is required for registration.)
192. Evaluation in Home Economics Education. Evaluation as a means of measuring progress toward important goals in different areas of home economics; study of available tests and other evaluation materials; construction and refinement of various evaluation instruments. Study of elemental statistical techniques useful to home economics teachers. (3 cred.; sr., grad.; prereq. Ed. 51A, H.E. Ed. 90 or parallel)
- 193A. Home Economics Curriculum (secondary level). A study of the contribution of home economics at elementary and secondary levels; evaluation of curriculum practices and techniques employed in curriculum planning and reconstruction. (3 cred.; sr., grad.; prereq. H.E. Ed. 94 or parallel or permission of instructor)
- 193B. Home Economics Curriculum (college level). The place of home economics in higher education; problems facing home economics in small colleges; curriculum

* Plans for the home experience prerequisite for H.E. Ed. 91 and 93 will be made in conferences for first quarter juniors on Tuesdays IV hour, in Room 114 Home Economics.

† A fee of \$1 per credit is charged for this course.

- offerings; teaching schedules and load; appropriate reference materials. (3 cred.; sr., grad.; prereq. consent of instructor)
- 194A. Adult Education in Home Economics. An analysis and study of the problems affecting community and family living; methods and techniques used in helping men and women and out-of-school youth meet present situations. Course is planned for teachers and supervisors of adult classes, extension and farm security workers. (3 cred.; sr., grad.; prereq. H.E. Ed. 91, 93, or parallel)
- 194B. Adult Education in Home Economics. Objectives of adult education to meet present needs; planning a community program; teaching procedures, discussion of special problems. Course is planned for teachers and supervisors of adult classes. (3 cred.; sr.; prereq. H.E. Ed. 91, 93, or parallel)
- 197.† Organization and Methods of Related Art Teaching. Organization of a related art course and methods of teaching art as applied to familiar objects and processes. The course is planned on an individual problem basis. (1 to 3 cred.; sr.; prereq. H.E. Ed. 91, H.E. 180 or parallel; permission of instructor)
- 199E.‡ Internship. Directed teaching and practice work at the graduate level for candidates for the master of education degree. (Cred. ar.; grad.)

HORTICULTURE

There are four distinct fields in horticulture: vegetable growing, fruit, growing, landscape gardening, and floriculture. In some cases students may find it advisable to include more than one field in their major. Those who contemplate entering into some horticultural industry such as fruit growing, market gardening, truck growing, nursery business, greenhouse business, florist work, or landscape gardening, should follow the Curriculum in Technical Agriculture. Students who plan on taking postgraduate work in preparation for research or college teaching are advised to follow the Science Specialization Curriculum.

1. **Technical Agriculture**—The courses listed below are recommended for students majoring in horticulture in the indicated fields:
- Vegetable Growing: Hort. 32, 110, 135, 137; Agron. 31.
 - Fruit Growing: Hort. 6, 40, 56, 107, 110, 111, 121; Agron. 31.
 - Landscape Gardening: Hort. 6, 11, 21, 22, 24, 25, 40, 56, 176; Agr. Eng. 3, Draw. and Des. Geom. 41, 42, 43.
 - Floriculture: Hort. 11, 12, 14, 56, 110, 153; Agron. 31.

Additional courses in such supporting fields as botany, plant pathology, entomology, soils, etc., may be added to fit the needs of individual students. Minor sequences should be arranged in consultation with the adviser.

2. **Science Specialization**—For subjects recommended for major in some field of horticulture, consult adviser.

Freshman and Sophomore Courses

- General Horticulture. A study of fruit, vegetable and ornamental plants, including factors which influence their culture, value and importance in Minnesota. Lectures and recitations. (3 cred.; no prereq.)
- Fruit Growing. The fundamental principles of fruit growing. Sites, soils, nursery stock, planting and planting plans, tillage, fertilization, cover crops, pollination, frost avoidance, pruning and thinning. Lectures and references. (3 cred.; no prereq.)
- Home Floriculture. Designed for the student who does not take any other courses in floriculture. Gives the student a working knowledge of the propagation, culture, and uses of common garden flowers and house plants. Lectures, reference reading, and laboratory. (3 cred.; 2 cred. only if Hort. 56 has been taken; no prereq.)

† A fee of \$1 per credit is charged for this course.

11. Garden Flowers. A study of the common annuals, biennials, and perennial flowers, with special emphasis on their uses in landscape planting. Lectures, reference reading, laboratory, and field trips. (3 cred.; prereq. Bot. 9 cred. or equiv.)
12. Commercial Floriculture, Fall Crops. A study of the culture of the principal florist crops with major emphasis on chrysanthemums, carnations, and cut flowers and potted plants especially adapted to Christmas sales. Lectures, reference reading, laboratory, and field trips to greenhouses and flower stores. (3 cred.; prereq. Bot. 6 cred. or equiv.)
14. Commercial Floriculture, Spring Crops. A study of the culture of the principal florist crops with major emphasis on roses, bulbous plants, the minor cut flower crops, and bedding plants. Lectures, reference reading, laboratory, and field trips to greenhouses and flower stores. (3 cred.; prereq. Bot. 6 cred. or equiv.)
21. Plant Materials, Fall and Winter Aspects. A study of the trees, shrubs and evergreens used in landscape planting, with special emphasis on their fall and winter characters, their identification and uses in landscape design. Lectures, outdoor and indoor laboratories, field trips. (3 cred.; prereq. Bot. 9 cred. or equiv.)
22. Plant Materials, Spring and Summer Aspects. A study of trees, shrubs, and evergreens used in landscape planting, with special emphasis on their spring and summer characters, particularly that of blooming habit. Lectures, outdoor and indoor laboratories, field trips. (3 cred.; prereq. Bot. 9 cred. or equiv.)
24. Principles of Landscape Design. A study of the principles of landscape design with special reference to their practical application in the planning of residential landscapes. The relationships of landscape design, architectural design, and interior decoration. Landscape plans, landscape drafting techniques, and methods of presentation. Lectures, drawings, and practical problems in solving home landscape and garden projects. (3 cred.; prereq. 21 or 22 or instructor's permission)
25. Principles of Planting Composition. A study of the principles of planting arrangement and a study of the esthetic qualities of plants, their value and uses in all kinds of landscapes and gardens; special reference to home landscapes and gardens. Lectures and problems in planting compositions. (3 cred.; prereq. 21 or 22 or instructor's permission)
32. Vegetable Growing. The fundamental principles of vegetable growing. Scope of the industry and its place in agriculture. Varieties, seed production, regional adaptation, soils, fertilizers, equipment, storage, systems of production and marketing. (3 cred.; prereq. Bot. 6 cred.)
40. Horticulture Laboratory. Lectures and practice on operations used in orchard and berry fields. Planning, planting, pruning, grafting, etc. (2 cred.; soph., jr., sr.; prereq. 6 or instructor's permission)

Junior and Senior Courses

56. Plant Propagation. Methods of propagating plants by seed, cuttings, layers, and grafting. Practical work in management of nursery stock, bulbs, and plants. Lectures, reference reading, and field trips. (3 cred. [2 cred. if Course 10 has been taken]; jr., sr.; prereq. Bot. 6 cred. or equiv.)
107. Orchard Management. A detailed study of the various operations in orchards and berry fields. Operating costs and profits. Lectures, laboratory, and individual problems. (3 cred.; jr., sr.; prereq. 6)
110. Horticultural Crop Breeding. The principles of plant improvement, their special application to horticultural plants, and the breeding methods used with each of the important horticultural crops. (3 cred.; jr., sr.; prereq. Agron. 31)

111. Systematic Pomology. Fruit varieties. Classification, description, identification, and elements of judging. Lectures, laboratory, and a survey of the literature. (3 cred.; jr., sr.; prereq. 6, Bot. 9 cred. or equiv.)
121. Small Fruit Culture. Cultural practices for each of the small fruits. Brief consideration is given to their botanical relationships and the history of their commercial development. Lectures, problems, and survey of literature. (3 cred.; jr., sr.; prereq. 6 or 32, Bot. 9 cred. or equiv.)
135. Potatoes. Culture, handling, storage, seed maintenance, varieties, improvement, and physiology of the potato plant. (3 cred.; jr., sr.; prereq. 32, Bot. 9 cred. or equiv.)
137. Vegetable Crops. Lectures and survey of literature relating to vegetable crop production. Assigned readings include the classification, culture, improvement, and physiology of leading vegetable crops. (3 cred.; jr., sr.; prereq. 32, Bot. 9 cred. or equiv.)
153. Conservatory Plants and Florists' Flowers. A systematic study of the plants adapted to growing in conservatories and homes, and also of florists' cut flowers and potted plants. Lectures, laboratory, and field trips to greenhouses. (3 cred.; jr., sr.; prereq. Bot. 9 cred. or equiv.)
176. Landscape Construction and Maintenance. A survey of garden and landscape construction, materials, grading, planting, and maintenance, including plans, specifications, and computation of costs. Materials and construction of walks, walls, fences, steps, pools, terraces, lawns, planting areas, flower beds, etc. Lectures, field trips, reports, and construction problems. (3 cred.; jr., sr.; prereq. 24 or 25 or instructor's permission)
- 190-191-192. Special Problems. Problems based upon the work given in the preceding courses. (2 to 4 cred. per qtr.; jr., sr.; prereq. instructor's permission)
- 193-194. Horticultural Seminar. Reports and discussions of problems and investigational work. (1 cred. per qtr.; sr.; prereq. Hort. 9 cred.)

INORGANIC CHEMISTRY

INSTITUTE OF TECHNOLOGY

SCHOOL OF CHEMISTRY

Freshman and Sophomore Courses

- 1†-2‡,3‡ General Inorganic Chemistry and Semimicro Qualitative Analysis. (12 cred.; all; no prereq. for 1-2, Course 2 is prereq. for 3)
- 4‡-5‡ General Inorganic Chemistry. (8 cred.; all; prereq. one year of high school chemistry)
- 11.‡‡ Semimicro Qualitative Analysis. (4 cred.; prereq. 2, 5, 7, 10, or 15)

For additional courses and course descriptions see the Bulletin of the Institute of Technology.

JOURNALISM

SCHOOL OF JOURNALISM, COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

For courses and course descriptions see the Bulletin of the School of Journalism. See also Publications and Rural Journalism, page 109.

† A fee of \$2 per quarter is charged for this course. The student should purchase a \$5 chemistry deposit card from the bursar in the Administration Building (Minneapolis Campus). No student will be assigned a desk in the laboratory until he presents this card. The \$2 course fee, laboratory material, and breakage will be charged against the deposit.

‡‡ A fee of \$2.40 per quarter is charged for this course. The student should purchase a \$5 chemistry deposit card from the bursar, in the Administration Building (Minneapolis Campus). No student will be assigned a desk in the laboratory until he presents this card. The \$2.40 course fee, laboratory material, and breakage will be charged against the deposit.

MATHEMATICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Exemption test—An exemption test in Math. 1 will be offered for students in the College of Agriculture, Forestry, and Home Economics at an arranged time. For information consult the dean of the college.

Placement tests—In each of Courses 1 and 6, a placement test will be given during the first two weeks of the quarter. Students who fail in this test will be advised to take a more elementary course. In particular, any student who offers not more than one-half year of high school advanced algebra as a substitute for Course 1 and who fails to pass the placement test in Course 6, will be required to take Course 1 before taking more advanced mathematics. A student who has had a complete year of elementary algebra and a corresponding course in advanced high school algebra for one-half year, should be able to pass the placement test in Course 6. The first class meeting in each course is of particular importance.

Freshman and Sophomore Courses

1. Higher Algebra. (5 cred.; all; prereq. one yr. elementary algebra; open for credit to any student offering not more than one-half year of high school higher algebra for entrance)
6. Trigonometry. (5 cred.; all; prereq. plane geometry and Course 1 or high school higher algebra; open for credit even to students offering high school trigonometry for entrance)
7. College Algebra. (5 cred.; all; prereq. 6, or high school trigonometry if approved by department chairman)

For additional courses and course descriptions see the Bulletin of the College of Science, Literature, and the Arts.

MILITARY SCIENCE AND TACTICS

The University of Minnesota, like all major schools in the nation, provides a four-year course in Military Science and Tactics designed to qualify outstanding male students of the University for appointment in the Officers' Reserve Corps, Army of the United States. Courses of instruction in the following branches of the Army are offered: Coast Artillery (Anti-Aircraft), Signal Corps, and Medical Corps. Physically qualified students in the College of Agriculture, Forestry, and Home Economics may register for courses in the Coast Artillery Corps. These courses are elective and the total of eighteen credits applies toward a degree. The four-year program is split into two parts, basic and advanced. The Basic Course consists of six quarters of three hours of work per week, for one credit per quarter. Upon completion of the Basic Course a student whose academic average is "C" or above is eligible to apply for the Advanced Course. A limited number of students are recommended to the president of the University by the professor of military science and tactics for the Advanced Course each year. Those students who are approved by the president of the University are admitted to the Advanced Course of instruction. This course consists of six quarters of five hours of classroom work per week, for which three credits per quarter are offered.

Students enrolled in the Advanced Course are furnished a regulation officer's uniform and receive from the Federal Government a fixed sum of pay per day while pursuing this course. At the end of the first year of advanced work, students attend a six weeks' summer camp. Coast Artillery Corps students usually go to Fort Sheridan, Illinois. All expenses incident to training camp attendance, i.e., travel expenses, etc., are borne by the government. Those students who successfully complete the Advanced Course, if

recommended by the president of the University and by the professor of military science and tactics, are eligible for appointment as second lieutenants in the Army of the United States. A limited number of permanent (officers') commissions are available each year to outstanding Second Year Advanced Course students in both the U. S. Army and the Marine Corps. The total compensation for the two years of Advanced Course work amounts to over \$200. Officers trained in the University of Minnesota R.O.T.C. units are now on duty in all parts of the United States, its foreign possessions, and other parts of the world.

- 1,2,3.* First Year Basic Course R.O.T.C. Coast Artillery Corps. Leadership, rifle marksmanship, ammunition, weapons and materiel, hygiene and sanitation, military courtesy and discipline, national defense, military history and policy, army organization, obligations of citizenship. (1 cred. each qtr.; prereq. higher algebra, geometry, and trigonometry.) Students who do not possess these prerequisites at the time of registration may be accepted by the commandant if they agree to complete these studies prior to the gunnery courses.
- 4,5,6.* Second Year Basic Course R.O.T.C. Coast Artillery Corps. Leadership, weapons and materiel, basic gunnery, identification of aircraft, characteristics of naval targets, motor transportation, map reading. (1 cred. each qtr.; soph.; prereq. 1, 2, 3, higher algebra and plane trigonometry)
- 151-152,153.§ First Year Advanced Course R.O.T.C. Coast Artillery Corps. Leadership, position finding, conduct of fire, gunnery for heavy artillery, gunnery for anti-aircraft artillery, administration, aerial photograph reading, defense against chemical warfare, signal communications, orientation. (3 cred. each qtr.; prereq. 4, 5, 6)
- 154-155,156.* Second Year Advanced Course R.O.T.C. Coast Artillery Corps. Military law, military history, supply, field engineering, leadership, combat orders, artillery tactics and technique, orientation. (3 cred. each qtr.; prereq. Courses 151-152,153 for 154-155, Course 54-55 for 156)

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Credit is offered to students in the College of Agriculture, Forestry, and Home Economics who may wish to elect work in the Department of Music.

Freshman and Sophomore Courses

1. Ear Training. (2 cred.; for non-music majors; no prereq.; all. Registration is limited; written permission from the Junior College Office, 106 Folwell Hall, is necessary for admission.)
- 1T-2T-3T. Music Theory. A correlated course including Ear Training, Sight Singing, Melodic and Harmonic Dictation, Keyboard and Written Harmony. (9 cred.; primarily for music majors and minors. Students must make arrangements for a placement test in the office of the Department of Music.)
- 4T,5T-6T. Music Theory. Continuation of Music Theory 1T-2T-3T. (12 cred.; prereq. 3T)
- 31-32-33.¶ Music Appreciation. Cultivation of better understanding of music heard today. The course is designed for students with a general interest in music rather than for those majoring in music. (6 cred.; no prereq.)

* Modified to a Basic Course ROTC Branch Immaterial for the duration of the war.

§ Suspended for the duration of the war.

¶ Students may enter any quarter.

- 11.‡ Piano.
 12.‡ Voice.
 13.‡ Violin.
 14-26.‡ Other Orchestral Instruments.
 27.‡ Organ.
 40-41-42. Orchestra. (6 cred.; all; prereq. consent of director)
 43-44-45. University Chorus. (3 cred.; all; prereq. consent of director)

The following course is offered only for students in the College of Agriculture, Forestry, and Home Economics:

- 43UF,44UF,45UF. University Farm Music Ensembles—Vocal and Instrumental. With special reference to music used in extension, farm, home, school, and recreational activities and situations. (1 cred. per qtr.; all; prereq. consent of director)

For additional courses and course descriptions see the Bulletins of the College of Science, Literature, and the Arts and the College of Education.

NAVAL SCIENCE AND TACTICS

Naval training is conducted at the University of Minnesota. This institution has been designated as one to give N.R.O.T.C. and V-12 training. The program is now in the process of change and as this goes to press no definite statements can be made as to courses, operation, and requirements for entrance into the program.

ORGANIC CHEMISTRY INSTITUTE OF TECHNOLOGY SCHOOL OF CHEMISTRY

- 54-55-156. Elementary Organic Chemistry. (6 or 9 cred.; jr., sr.; prereq. 15 cred. in college chem.)
 57‡‡-58‡‡-159.‡‡ Elementary Organic Chemistry Laboratory. (4 or 6 cred.; jr., sr.; prereq. 54-55-156 or accompanying 54-55-156)

For additional courses and course descriptions see the Bulletin of the Institute of Technology.

ORIENTATION

- 1f,w,s. College Orientation Lectures. Required of all students entering the college except those who have had two years or more work in another college. Students must register for this course in their first quarter in college. (1 cred.)

PHYSICAL CHEMISTRY INSTITUTE OF TECHNOLOGY SCHOOL OF CHEMISTRY

- 101-102-103. Physical Chemistry. (3 cred. per qtr.; jr., sr., grad.; prereq. two yrs. college chem., one yr. college phys., differential and integral calculus)
 104-105-106.‡‡ Physical Chemistry Laboratory. (1 to 2 cred. per qtr.) To accompany or follow 101-102-103.

For additional courses and course descriptions see the Bulletin of the Institute of Technology.

‡ Fees for Music 11 to 27 inclusive:

1. One individual lesson per week, 2 credits, \$25.
2. Two individual lessons per week, 4 credits, \$50.

‡‡ A fee of \$2 per quarter is charged for this course. The student should purchase a \$5 chemistry deposit card from the bursar, in the Administration Building (Minneapolis Campus). No student will be assigned a desk in the laboratory until he presents this card. The \$2 course fee, laboratory material, and breakage will be charged against the deposit.

PHYSICAL EDUCATION FOR MEN

The Physical Education Department offers men the opportunity to elect instruction in sports of a recreational nature in which men can participate during their college career and in later life.

Not more than nine credits in courses in physical activities may be counted toward graduation.

1,2,3. Sports Education. (1 cred. per qtr.; all; no prereq.)

4A-B-C. Fundamentals of Athletic Sports. (1 cred. per qtr.; no prereq.)

7A-B-C. Physical Education Activities. (1 cred. per qtr.; soph., jr., sr.; no prereq.)

8. Dual Spring Sports. (1 cred.; all; no prereq.)

For schedule of hours and rooms see the Combined Class Schedule.

A towel and locker fee of \$1.25 per quarter is charged all students using physical education facilities for activity. Uniforms for class work or recreational activity are \$1 per quarter.

For additional courses and course descriptions and for the special four- and five-year professional course for physical education majors see the Bulletin of the College of Education.

PHYSICAL EDUCATION FOR WOMEN

The General Course in Physical Education offered by the Department of Physical Education for Women provides a wide program of sports and other activities to meet the varying interests and needs of all the women students. The program offers an opportunity to take courses in body building and conditioning and for the acquisition of personal and recreational skills.

All women students will be required to take at least 3 credits in physical education. The course chosen must be approved by the major adviser in the Department of Physical Education for Women.

Nine credits is the maximum number that can be gained toward the degree by taking courses in physical education activities.

For professional courses designed to prepare graduates for the responsible direction of physical education activities see the Bulletin of the College of Education.

Statement of fees—A physical education fee of \$1.75 per quarter is charged for all courses except Phys. Ed. 8, Horseback Riding. Maximum fee per student, \$3.50 per quarter.

Phys.Ed. 1-2-3-4-5-6-8. (1½ cred. per quarter for classes meeting three times per week.

GROUP I. AQUATICS

Canoe Paddling

Swimming, Beginning

Swimming, Advanced Beginning

Swimming, Intermediate

Swimming, Advanced

Diving

Lifesaving

Swimming, War Functional Swimming,
Synchronized Water Safety Instructors'
Course

GROUP II. THE DANCE

National Dances

Modern Dance, Elementary

Modern Dance, Intermediary and
Advanced

Ballroom Dance, Elementary

Country Dance

Recreational Rhythms

GROUP III. INDIVIDUAL SPORTS AND ACTIVITIES

Archery, Elementary	Horseback Riding
Archery, Intermediate	Recreational Games
Badminton, Elementary	Skating, Plain, Figure
Badminton, Intermediate	Classes meet at the Arena
Bowling	Skiing
Golf, Elementary	Tennis, Elementary†
Golf, Intermediate	Tennis, Intermediate‡
	Tennis, Advanced‡

GROUP IV. TEAM SPORTS AND ACTIVITIES

Softball	Speed Ball
Basketball	Volleyball

GROUP V. BODY BUILDING

Individual Body Building	Posture and Conditioning
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PHYSICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Freshman and Sophomore Courses

- 1-2†-3. Introduction to Physical Science. (9 cred.; all; prereq. high school algebra and plane geometry)
- 1a††-2a††-3a††. Introduction to Physical Science. Laboratory included. (12 cred.; all; prereq. high school algebra and plane geometry)
- 7††-8††-9†† General Physics. Laboratory work an integral part of the course. (For students majoring in physics, mathematics, and chemistry and for students in the Institute of Technology.) (15 cred.; all; prereq. Math. 15-16 or equivalent or registration in differential calculus)
29. Introduction to Meteorology. (3 cred.; all; prereq. high school phys. or equiv.)

PHYSIOLOGY

MEDICAL SCHOOL

Freshman and Sophomore Courses

4. Human Physiology. For academic, home economics, pharmacy, and other students. Lectures, recitations, and demonstrations. (4 cred.; all; prereq. 1 qtr. zool., 1 qtr. chem.)

Junior and Senior Courses

51. Human Physiology. (May be substituted for 4) (6 cred.; primarily for phys. ed. students*; jr., sr.; prereq. Zool. 1-2-3; Inorg. Chem. 1-2-3, or 4-5, or equiv.; Physiol. 50; Human Anatomy or Comparative Anatomy)
56. Physiological Chemistry. (2 cred.; primarily for dental students*; jr., sr.; prereq. organic chemistry)
57. Physiological Chemistry. (7 cred.; jr., sr.; prereq. 56)
58. Human Physiology. (5 cred.; primarily for dental students*; jr., sr.; prereq. zool. and Physiol. 56, 57)

* Others may be admitted by special permission.

† To receive credit for any part of this course a student must complete the parts preceding the dagger.

‡ Students taking tennis must pay 50 cents for a tennis court permit.

†† A fee of \$2 per quarter is charged for this course.

59. Human Physiology. (5 cred.; sr.; prereq. 58 or equiv.)
60. Human Physiology. For Medical Technology students and others. (6 cred.; prereq. Physiol. 100-101 or equiv.)
100. Physiological Chemistry. (7 cred.; jr., sr.; prereq. org. chem., and physical chem.)
101. Physiological Chemistry. (6 cred.; jr., sr.; prereq. 100)
103. Physiology of Circulation, Respiration, etc. (9 cred.; jr., sr.; prereq. zool. and org. chem.)
104. Physiology of Endocrines, Nervous System, etc. (6 cred.; lect. only, 4 cred.; jr., sr.; prereq. 103 or org. chem. and neurology)

For additional courses and course descriptions see the Bulletin of the Medical School.

PLANT PATHOLOGY AND BOTANY

Training in this field may lead to state and Federal Government service, college teaching and experiment station work, and employment in a variety of commercial fields.

Two fields of specialization are available in the division: (a) plant pathology and (b) agricultural botany and applied plant physiology.

A. Plant pathology—Students interested in plant pathology will ordinarily register in the Science Specialization Curriculum with a view to taking graduate work. A major in plant pathology in the Technical Agriculture Curriculum must have approval of the division.

Recommended for major in plant pathology:

1. **Science Specialization:** Pl. Path. 1 or 10; 105-106-107; 111 or 112 or 114; 119, 143.
2. **Technical Agriculture:** Consult adviser in Plant Pathology

B. Agricultural botany and applied plant physiology—A major in agricultural botany and applied plant physiology should include basic courses in the Department of Botany in the College of Science, Literature, and the Arts. Since the student may wish to apply his botanical training to one of the several fields of horticulture, agronomy, soils, forestry, and entomology and economic zoology, subjects from these divisions should also be included in either the major or minor.

A major in agricultural botany and applied plant physiology in the Technical Agriculture Curriculum must have approval of the division. A major in Science Specialization assumes continuation in graduate work. For courses recommended for major in both the Technical Agriculture and Science Specialization Curricula, consult divisional adviser.

Freshman and Sophomore Courses

1. Plant Pathology. An introductory course in plant diseases. Lectures, laboratory, and reference. (5 cred.; soph., jr., sr.; not open to those who have completed Course 10; prereq. 9 cred. in plant sciences of which at least 6 shall be in botany)
3. Weeds. A study of the identification, structures, and habits of weed plants in relation to methods of controlling them. (3 cred.; fr., soph., jr., sr.; prereq. Bot. 6 cred.)
4. Grasses and Sedges. A study of the grasses and a few of the sedges of this area relative to their identification, anatomy, ecology, and economic value. (3 cred.; soph., jr., sr.; prereq. Bot. 9 cred. or equiv.)
9. Seed Technology and Testing. Testing, including germination, identification, purity, seed storage; processing and preparation of seed for trade, seed legislation. (3 cred.; soph., jr., sr.; prereq. Bot. 9 cred. or equiv.)
10. Forest Pathology. Diseases of forest and shade trees, and the rotting of timber. Symptoms, etiology, and control. Lectures, laboratory, and reference work. (5 cred.; soph., jr., sr.; not open to those who have completed Course 1; prereq. Bot. 6 cred.)

Junior and Senior Courses

51. Special Problems in Forest Pathology. Collection, identification, and cultural studies of tree pathogens and wood rotting fungi. (2 to 5 cred.; jr., sr.; prereq. 10)
53. Food Plants of Game Animals. A study of food plants, uses, habits, reproduction, and identification. (3 cred.; jr., sr.; prereq. one yr. of bot. and one yr. of zool., or equiv.)
56. Introduction to the Study of Fungi. The structure, development, and identification of fungi, especially those of economic importance. (3 cred.; jr., sr.; prereq. Bot. 9 cred. or instructor's permission)
101. Special Agricultural Botany. Botanical characters, environmental relations, and utilization of important groups of plants, especially those of the tropics and subtropics. (3 or 5 cred.; jr., sr.; prereq. Bot. 9 cred. or equiv.)
102. Physiology of Seeds. Physiology of development, ripening, storage, dormancy, viability, and germination; processing and seed treatment in relation to viability. (3 cred.; jr., sr.; prereq. Bot. 51 and Agr. Biochem. 4)
104. Industrial Mycology. Fungi in relation to industrial processes and products. (3 cred.; jr., sr., grad.; prereq. 56 or 1 or 10)
- 105-106-107. Mycology. Morphology and taxonomy of fungi. Lectures, laboratory, and field work. (3 or 5 cred. per qtr.; jr., sr.; prereq. 1 or 10 or equiv.)
110. Principles of Pathology. A systematic consideration of the basic factors governing the development of plant diseases. (5 cred.; jr., sr.; prereq. 1 or 10, Bact. 53)
111. Diseases of Field Crops. Detailed study of diseases of field crops, including symptomatology, etiology, and practical methods of control. (3 cred.; jr., sr.; prereq. 1 or 10)
112. Diseases of Fruit and Vegetable Crops. Special study of diseases of fruit and vegetable crops, especially those important in Minnesota. Laboratory, lecture, and field work. (3 cred.; jr., sr.; prereq. 1 or 10)
114. Advanced Forest Pathology. A detailed study of wood rots, including a study of the deterioration of wood products caused by fungi. Lectures and laboratory work. (3 cred.; jr., sr.; prereq. 1 or 10)
118. Bacterial Diseases of Plants. Bacteria as plant pathogens; representative types with particular reference to technique used in studying bacterial diseases of plants. (3 cred.; jr., sr.; prereq. 1 or 10)
119. Principles of Plant Disease Control. A general consideration of principles and practices in controlling plant diseases. (3 cred.; jr., sr.; prereq. 1 or 10)
- 141-142. Insects in Relation to Plant Disease. A study of the principal insect vectors and their habits; types of insect injuries affecting health of plants; modes of insect transmission, and dissemination of plant disease; methods of rearing and handling insect vectors. (6 cred.; jr., sr.; prereq. 8 cred. in ent. or plant path.)
143. Methods. Theoretical and practical consideration of methods used in mycological and pathological research. (3 cred.; jr., sr.; prereq. 1 or 10)
160. Plant Histochemistry. The localization, identification, and function of plant constituents. Lectures, demonstrations, and laboratory. (3 cred.; sr.; prereq. Bot. 51)
161. Technology of Fruits and Vegetables. The effects of temperature, respiration, packing, etc., on storage life. (3 cred.; sr.; prereq. Bot. 51)
162. Physiological Relations of Crop Plants to Temperature. An advanced study of general temperature effects and especially of the relation of plants to low temperatures. Lectures, readings, and translations. (3 cred.; sr.; prereq. Bot. 51)
163. Applied Plant Physiology. A general discussion of plant physiology as applied to the food industries and to agriculture and forestry. Lectures and demonstrations. (3 cred.; jr., sr.; prereq. Plant Physiol., Bot. 51)

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Freshman and Sophomore Courses

- 1-2†-3. American Government and Politics—Parts 1-2. National, state, and local. Constitutions and fundamental laws; governmental organization; division and separation of powers; legislative, executive, and judicial procedure and problems. Part 3. Principal functions and services of government, defense, law enforcement, regulation of business, public works, and social services. (9 cred.; all; no prereq.)

For additional courses and course descriptions see the Bulletin of the College of Science, Literature, and the Arts.

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Freshman and Sophomore Courses

- A. Elementary Psychology. An introduction to psychology with special attention to its applications. (5 cred.; fr.,* soph.; no prereq.)
- 1-2.† General Psychology. A general introduction to the study of human behavior with emphasis on the development of the individual. (6 cred.; 3rd qtr. fr. with C average, soph., jr., sr.; no prereq.)
3. Psychology Applied to Daily Life. (3 cred.; soph., jr., sr.; prereq. 1-2)
- 4-5.†† Introductory Laboratory Psychology. (4 cred.; soph., jr., sr.; may be taken with or after 1-2)

For additional courses and course descriptions see the Bulletin of the College of Science, Literature, and the Arts.

PUBLIC HEALTH

MEDICAL SCHOOL

Freshman and Sophomore Courses

3. Personal Health. Elementary principles of normal body function; predisposing and actual causes of disease; ways in which disease may be avoided. (2 cred.; fr., soph.; no prereq.; not open to students who have taken Human Biol. 10C in the General College)
4. Health Problems of Adult Life. Personal health and prevention of disease in the family; relation to community health and disease control; important diseases and their prevention. (2 cred.; all; prereq. 3; not open to students who have taken Human Biol. 10C in the General College)

Junior and Senior Courses

50. Public and Personal Health. Causes of diseases and of physical defects; fundamental principles and working methods of health conservation and disease prevention. Lectures, discussions, and directed readings. (3 cred.; open to jr. and sr. who have not taken Courses 3, 4, 52, 53, or Human Biol. 10C in the General College; no prereq.)

* This course is open to a limited number of first and second quarter freshmen with the approval of their advisers and to third quarter freshman with a C average.

† To receive credit for any part of this course a student must complete the parts preceding the dagger.

‡ A fee of \$1 per quarter is charged for this course.

51. Community Hygiene. Elementary concepts of development, spread, and prevention of preventable diseases; community programs for their control. (3 cred.; jr., sr.; prereq. 3, 50, or Human Biol. 10C in the General College; not open to students who have taken 4, 52, or 53)
- 52a,b.* Health Care of the Family. Factors affecting the health of the family as a unit; environmental factors, including elementary sanitation; prevention of accidents; communicable diseases, their transmission and prevention; prenatal and infant hygiene; principal problems in preschool and school hygiene; care of the sick room; observation and care of the patient; elementary symptomatology. For students of home economics. (3 cred.; soph., jr., sr.; prereq. Bact. 53, Physiol. 4; not open to students who have taken 50, 51, or Human Biol. 10C in the General College)
57. Health of Infant and Preschool Child. Maternal and child health in public health program, problems of infant and maternal mortality, growth and development of infant and young child, care and-feeding of normal infant; prevention and correction of physical defects. (2 cred.; jr., sr.; prereq. 4 or 50 or 51 or 52 or 53)
59. Health of the School Child. Mental and physical growth; prevention and control of diseases common to the school-age child; health appraisal; correction of physical defects; emotional problems; care of the handicapped; the school environment and its effect on child health; accident prevention and emergency care; practical problems of health supervision and administration. (3 cred.; jr., sr.; prereq. 3 and 4 or 3 and 51 or G.C. 10C and 4 or G.C. 10C and 51 or 50 or 53; will be waived for teachers and school nurses, but cred. granted only after completion of prereq.)
60. Tuberculosis and Its Control. History of tuberculosis movement and campaign in the United States; early diagnosis and sanatorium treatment; tuberculosis in children; psychology of tuberculosis; supervision of returned sanatoria patients; state program for the eradication of tuberculosis; legislation. (2 cred.; jr., sr.; prereq. 4, or 50, or 51, or 52, or 53 and 62 which may be taken concurrently)
102. Environmental Sanitation I. Methods for promoting man's health and comfort by controlling his environment; water supply sanitation, food sanitation, pollution abatement; sewage, excreta, and waste disposal; bathing place sanitation, air hygiene, illumination, housing control of insect and animal vectors of disease, industrial hygiene and sanitation. (3 cred.; sr., grad.; prereq. 50 or 51 or 53 or 100 or by permission or may be taken concurrently with any of these.

For additional courses see the Bulletin of the School of Public Health.

PUBLICATIONS AND RURAL JOURNALISM

- 50-51-52. Agricultural Journalism. Intended for students who may wish to enter the field of agricultural journalism as a profession. (9 cred.; jr., sr.; prereq. Journ. 13-14-15, 51-52, and permission of instructor)
53. Publicity. For students planning careers in agriculture or some allied industry, in which the co-operation of the press will be needed. (3 cred.; jr., sr.; prereq. Rhet. 1, 2, 3)

For additional courses see the School of Journalism in the Bulletin of the College of Science, Literature, and the Arts.

RHETORIC

Students upon entering the college are registered in Rhetoric I or II according to the results of their tests in proficiency in English.

* Lectures given fall and spring quarters only; laboratory sections given fall, winter, and spring quarters.

Those students who maintain a high standard in Rhetoric II and III and who complete suitable tests may be exempted from the requirement of Rhetoric 51.

Freshman and Sophomore Courses

1. Rhetoric I. Review of the conventions of English and the elements of composition. Writing of expository themes. (3 cred.; no prereq.)
2. Rhetoric II. Exposition with attention to the term paper. (3 cred.; prereq. 1 or exemption on basis of placement test)
3. Rhetoric III. Description and Narration. (3 cred.; prereq. 2)
- 12.‡ Debate and Discussion. Classroom and intercollegiate debating, briefing, methods of public discussion, the elements of persuasion. (3 cred.; soph., jr., sr.; prereq. 3, 22 recommended)
- 22.‡ Public Speaking. A practical course in fundamentals of speech making. (3 cred.; soph., jr., sr.; prereq. 3)
- 24.‡ Advanced Public Speaking. Types of audiences, psychology of persuasion, extempore speaking for special occasions. (3 cred.; soph., jr., sr.; prereq. 22)
- 28.‡ Play Production. History of the theater, theories of acting, staging, etc. A survey of the problems confronting the producer of amateur plays. (3 cred.; soph., jr., sr.; prereq. 3)
31. Survey of English Literature I. Survey of English literature of the sixteenth, seventeenth, and eighteenth centuries. (5 cred.; soph., jr., sr.; prereq. 3)
32. Survey of English Literature II. Survey of English literature of the nineteenth century. (3 cred.; soph., jr., sr.; prereq. 3)
33. American Life in American Literature. A survey of our significant national literature. (3 cred.; soph., jr., sr.; prereq. 3)
34. Books and Reading. The selection of books and periodicals for the home library. (1 cred.; no prereq.)

Junior and Senior Courses

51. Exposition. Essays and articles; technical writing; application letters; review of English usage. (3 cred.; jr., sr.; prereq. 3)
- 59.‡ Advanced Play Production. Continuation of Course 28. Problems of directing, staging, and make-up. Study of representative one-act plays. Each student is required to produce a one-act play. A practical course for teachers. (3 cred.; jr., sr.; prereq. 28 or permission of instructor)
60. Contemporary Literature. Reading and analysis of important books of the current period. (3 cred.; jr., sr.; prereq. 3)

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

FRENCH

Junior College Courses

- 1-2. Beginning French. (10 cred.; all; no prereq.)
- 3-4. Intermediate French. (10 cred.; all; prereq. 1-2, or two years of high school French. Students who have had three years of high school French may omit Course 3 and take Course 4)
20. Oral and Written French. (5 cred.; all; prereq. 4 or four§ years high school French)

‡ A fee of \$1 per quarter is charged for this course.

§ Students who have had three years of high school French may be admitted to Course 20 with the consent of the department.

Senior College Courses

53. French Composition. (3 cred.; jr., sr.; prereq. 3-4)
 54-55. French Conversation. (6 cred.; jr., sr.; prereq. 53 or 20)
 70-71-72. Survey of French Literature. (9 cred.; jr., sr.; prereq. 3-4)

SPANISH

Junior College Courses

- 1-2. Beginning Spanish. (10 cred.; all; no prereq.)
 3-4. Intermediate Spanish. (10 cred.; all; prereq. 1-2, or two years of high school Spanish. Students who have had three years of high school Spanish may omit Course 3 and take Course 4)
 20. Oral and Written Spanish. (5 cred.; all; prereq. 4 or four|| years of high school Spanish)

Senior College Courses

53. Spanish Composition. (3 cred.; jr., sr.; prereq. 3-4)
 54-55. Spanish Conversation. (6 cred.; jr., sr.; prereq. 53 or 20)
 74-75-76.† Survey of Spanish-American Literature: Contemporary Prose and Poetry. 9 cred.; jr., sr.; prereq. 3-4)

For additional courses and course descriptions see the Bulletin of the College of Science, Literature, and the Arts.

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Freshman and Sophomore Courses

1. Introduction to Sociology. ((5 cred.; no prereq.)
 2. Individual and Minority Group Adjustment. (5 cred.; soph., jr., sr.; prereq. 1)
 14. Rural Sociology. (3 cred.; soph., jr., sr.; prereq. 1)
 45. Social Statistics. (5 cred.; soph., jr., sr.; prereq. 1. Not open to students who have received credit in Econ. 5)
 48. Social Control and Criminal Behavior. (3 cred.; prereq. 1)
 49. Social Problems. (3 cred.; 3rd qtr. soph., jr., sr.; prereq. Soc. 1)

Junior and Senior Courses

- 50-51. Areas of Social Work. (10 cred.; jr., sr.; prereq. 49)
 100. Social Psychology. (3 cred.; jr., sr., grad.; prereq. Soc. 1 and 6, or Psy. 1-2, and 9 cred. in soc. sci., ed., phil., or psy.)
 110. Rural Community Organization. (3 cred.; jr., sr., grad.; prereq. 4 courses in soc. or Soc. 1 and 15 cred. in soc. sci., child welfare, ed., phil., or psy., or consent of instructor)
 112. Problems in Rural Social Research. (2 cred.; sr., grad.*; prereq. same as for 110)
 114. Rural Social Institutions. (3 cred.; jr., sr., grad.; prereq. same as for 110)
 116. The Newspaper As a Social Institution. (3 cred.; jr., sr., grad.; prereq. same as for 110)

* Primarily for graduates, but mature students who are not graduates may be admitted with the consent of the adviser and the instructor.

† To receive credit for any part of this course a student must complete the parts preceding the dagger.

|| Students who have had three years of high school Spanish may be admitted to Course 20 with the consent of the department.

119. The Family. (3 cred.; jr., sr., grad.; prereq. same as for 110)
 120. Social Life and Cultural Change. (3 cred.; jr., sr., grad.; prereq. same as for 110)
 161. Social Aspects of Housing and Standards of Living. (3 cred.; sr., grad.; prereq. same as for 110)

For additional courses and course descriptions see the Bulletin of the College of Science, Literature, and the Arts.

SOILS

Soils majors in either Technical Agriculture or Science Specialization are expected to take Courses 5, 51, 105, and 108. Technical Agriculture majors should select, with the help of the adviser, a sufficient number of related elective courses in other plant sciences to complete the major sequence. In the Science Specialization Curriculum majors will be expected to select a combination of courses from those offered in botany, chemistry, geology, mathematics, and physics. In either case the subjects selected will be somewhat dependent upon the objective of the course of study being pursued.

Freshman and Sophomore Courses

4. Soils. Origin, formation and classification of soils. The soil profile and its development; physical and chemical properties of soils; organic matter and biological relationships; forms and movement of soil water; erosion control. (3 cred.; soph., jr., sr.; prereq. Inorg. Chem. 1-2 or 4-5)
 5. Soil Management. Nutrient requirements of crops; fertilizers and fertilizer materials; fertilizer practices; use of lime; farm manures, their composition, value and use; green manuring; soil management and fertility maintenance. (3 cred.; soph., jr., sr.; prereq. Soils 4)

Junior and Senior Courses

51. Field and Laboratory Studies of Soils. Field and laboratory studies of soil profiles, soil texture, and moisture relationships. Laboratory tests for soil reaction, plant nutrient deficiencies, and of liming and fertilizer materials. Soil maps and their interpretation. (2 cred.; jr., sr.; prereq. Soils 4)
 103. Principles of Soil Erosion. Causes and types of erosion; relation of erosion to soil types; control of erosion by tillage, contour-cultivation, strip farming, terracing, and crops; control of moisture and conservation of plant nutrients; relation of forests to erosion control. (3 cred.; jr., sr.; prereq. Soils 4)
 104. § Soils Mapping. Field courses in soil surveying. Students will be assigned to areas where soil surveys are in progress. Arrangements must be made in advance. (3 cred.; jr., sr.; prereq. 105 and 108)
 105. Minnesota Soils. Their Origin and Classification. Genesis, nature, and distribution of the soil types of Minnesota; development of soils as influenced by climatic, topographic, geologic, and vegetative factors; productivity ratings of Minnesota soils. (3 cred.; jr., sr.; prereq. Soils 4)
 107. Fertilizers. Commercial fertilizers and their uses; long-time fertility experiments; effect of fertilizer materials upon soils and upon the yield and composition of crops. Fertilizer experiments and fertility problems in Minnesota. (3 cred.; jr., sr.; prereq. Soils 4)
 108. Physical Properties of Soils. The determination of physical constants of soils, including mechanical composition. Lectures and laboratory. (3 cred.; jr., sr.; prereq. Soils 4)

§ Arrangements must be made in advance of registration.

THEORY AND PRACTICE OF TEACHING

COLLEGE OF EDUCATION

For courses and course descriptions see the Bulletin of the College of Education.

VETERINARY MEDICINE

Those contemplating matriculation in Veterinary Medicine are referred to the curriculum on pages 14 and 37, and to advisers in this division.

Junior and Senior Courses

- 50-51-52. Anatomy, Physiology, and Hygiene of Domestic Animals. Fundamentals of structure, function, and reproduction of domestic animals. The principles of animal hygiene, including the etiology and means of control of the more important communicable diseases. (9 cred.; jr., sr.)
109. Anatomy, Physiology, and Hygiene of Poultry. This course will be confined to the general anatomy of the fowl, the physiology of digestion and reproduction, and the prevention and control of the more important diseases affecting chickens and turkeys. (3 cred.; jr., sr.; prereq. Zool. 14-15, P.H. 1)

ZOOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Courses in this department are closely correlated with those offered by the Division of Entomology and Economic Zoology of the College of Agriculture, Forestry, and Home Economics. For courses of that division, see page 87.

Credit is given for acceptable work done at any approved seaside laboratory.

Freshman and Sophomore Courses

- 1†-2†-3.*†† General Zoology. (10 cred.; all; no prereq.)
- 14†-15.†† General Zoology. Structure, physiology, embryology, classification, and evolution of animals. (6 cred.; all; no prereq.) (Limited to 174)
- 21.†§ Histology. (5 cred.; soph., jr., sr.; prereq. 1-2-3)
- 22.††§ Comparative Anatomy. (5 cred.; soph., jr., sr.; prereq. 1-2-3)
- 46-47.† Ornithology. (6 cred.; soph., jr., sr.; prereq. 1-2-3 and permission of instructor)

Junior and Senior Courses

- 50.‡ Introduction to Comparative Physiology. (5 cred.; soph., jr., sr.; prereq. 1-2-3 or 15 cred. in bot., and 10 cred. in chem. or permission of instructor)
- 51.†§ Introductory Animal Parasitology. (5 cred.; jr., sr.; prereq. 1-2-3)

* Lectures may be elected without laboratory with the consent of the chairman of the department. Laboratory must be taken with the lectures, however, if zoology is offered as the required laboratory science. Students should elect lecture sections in which they can continue throughout the three quarters.

† To receive credit for any part of this course a student must complete the parts preceding the dagger.

‡ A fee of \$1 per quarter is charged for this course.

†† A fee of \$2 is charged for this course.

‡ Sections are limited. Written permission must be obtained from the Junior College office, 106 Folwell Hall.

- 52.‡¶ Introductory Entomology. (5 cred.; jr., sr.; prereq. 1-2-3)
 53.‡§ Faunistic Zoology. (5 cred.; jr., sr.; prereq. 1-2-3)
 82. Organic Evolution. (3 cred.; jr., sr.; prereq. 1-2-3 or Bot. 1, 7, 21)
 83. Introduction to Genetics and Eugenics. (3 cred.; jr., sr.; prereq. 1-2-3 or 10 cred. in bot.)
 107‡-108‡ Protozoology. (6 cred.; jr., sr., grad.; prereq. 15 cred.)
 117‡-118-119‡ Animal Ecology. (9 cred.; jr., sr., grad.; prereq. 15 cred.)
 120. General Ecology of Insects. (3 cred.; jr., sr.; prereq. 15 cred. in zool. or ent.)
 121.‡ Ichthyology. (3 cred.; jr., sr., grad.; prereq. 15 cred. in zool.)
 125‡-126‡-127‡ Advanced Entomology. (9 cred.; jr., sr., grad.; prereq. 15 cred.)
 144‡-145‡-146‡ Animal Parasites and Parasitism. (6 or 9 cred.; jr., sr., grad.; prereq. 15 cred.)
 149‡-150‡ Histology and Organology. (6 cred.; jr., sr., grad.; prereq. 15 cred. in zool. Permission of instructor necessary)

For additional courses and course descriptions see the Bulletin of the College of Science, Literature, and the Arts.

‡ A fee of \$1 per quarter is charged for this course.

§ Sections are limited. Written permission must be obtained from the Junior College office, 106 Folwell Hall.

¶ Sections limited to 20 each.

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