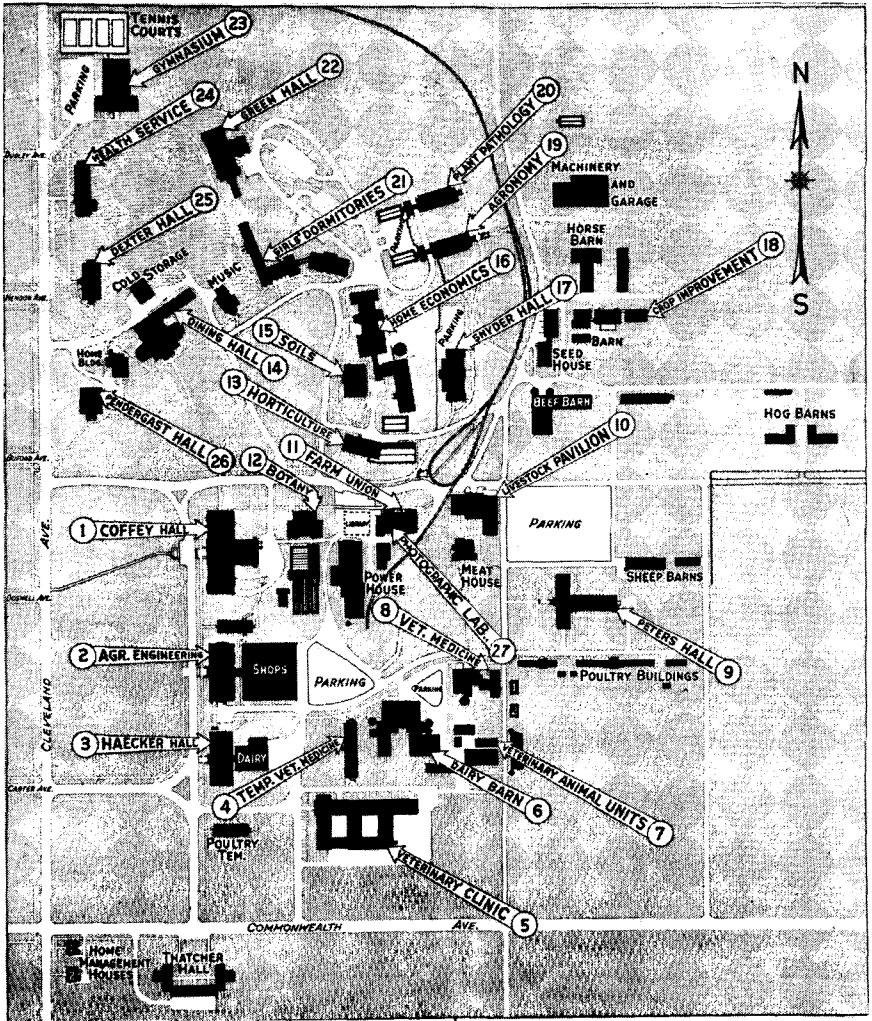


THE *Bulletin* OF THE
UNIVERSITY OF MINNESOTA



College of Agriculture, Forestry, Home
Economics, and Veterinary Medicine

1951-1953



— FIND YOUR WAY AROUND THE ST. PAUL CAMPUS —

This map for the most part is self explanatory. Some of the buildings which cannot be identified by their names alone are listed below:

Coffey Hall—Administrative Offices, Agricultural Extension, and Division of Entomology and Economic Zoology.

Agricultural Engineering—Divisions of Agricultural Engineering and Rhetoric.

Haecker Hall—Divisions of Dairy Husbandry and Agricultural Economics.

Peters Hall—Divisions of Animal and Poultry Husbandry.

Farm Union—Students' Union, Photographic Laboratory, and Rural Sociology.

Snyder Hall—Division of Agricultural Biochemistry.

Green Hall—School of Forestry.

How To Use This Bulletin

This bulletin is the basic source of information about the College of Agriculture, Forestry, Home Economics, and Veterinary Medicine. You should keep it at hand for ready reference. The Index will refer you to information on specific points.

Section I gives general information about procedures, requirements, and opportunities in this college.

Section II describes major parts of the college and the curricula offered in each. This section of the bulletin merely lists required and elective courses in the curricula and does not include descriptions of the courses.

Section III gives detailed descriptions, including prerequisites, of courses offered on the St. Paul Campus. For descriptions of courses offered in other colleges of the University it will be necessary for you to consult the appropriate bulletin. Your adviser will have a copy of the bulletins of other colleges, and they will be available also in the Office of Admissions and Records and the Agriculture Library.

In addition to this bulletin and any other you may need for program planning, you will be supplied at the time of registration with a copy of the *Class Schedule*. This is published just prior to each quarter and lists courses, class periods, and room numbers, including any last minute changes in offerings. It will also aid you in checking on the prerequisites for courses.

University of Minnesota

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FACULTY

(The first person in each listing below is responsible for administration.)

Agricultural Biochemistry—Professors William F. Geddes, Ph.D., Clyde H. Bailey, Ph.D., David R. Briggs, Ph.D., Walter O. Lundberg, Ph.D., Max O. Schultze, Ph.D., Fred Smith, Ph.D.; Associate Professors Paul D. Boyer, Ph.D., Robert Jenness, Ph.D.; Assistant Professor Irwin E. Liener, Ph.D.; Instructor Louis S. Cuendet, Ph.D.

Agricultural Economics—Professors Oscar B. Jesness, Ph.D., Austin A. Dowell, Ph.D., E. Fred Koller, Ph.D., George A. Pond, Ph.D.; Associate Professors Rex W. Cox, Ph.D., Selmer A. Engene, Ph.D.; Instructors Grover C. Chappell, M.S., Reynold Dahl, M.S., Percy M. Lowe, M.S.

Agricultural Education—Associate Professors Milo J. Peterson, Ph.D., Harry W. Kitts, Ph.D.; Instructors Alvin W. Donahoo, M.S., Gordon I. Swanson, M.S., Philip R. Teske,* M.S.

Agricultural Engineering—Professors Arthur J. Schwantes, M.S.(Ag.E.), Andrew Hustrulid, Ph.D., Philip W. Manson, M.S.(Ag.E.), Charles K. Otis, M.S.(Ag.E.); Associate Professors Evan R. Allred, M.S.(Ag.E.), Clarence H. Christopherson, M.A., John Strait, M.S.(Ag.E.); Assistant Professor Arnold M. Flikke, M.S.(Ag.E.); Instructors Allan H. Burman, B.S.(Agr.), J. Grant Dent, Virgil H. Johnson, M.S.(Ag.E.), Curtis L. Larson, M.S.(C.E.)

Agricultural Journalism—Associate Professor Harold B. Swanson, M.S.

Agronomy and Plant Genetics—Professors Herbert K. Hayes, D.Sc., Charles R. Burnham, Ph.D., Ray S. Dunham, M.S., Ernest H. Rinke, Ph.D.; Associate Professors Jean W. Lambert, Ph.D., Alois R. Schmid, Ph.D., Horace L. Thomas, Ph.D.; Assistant Professors Emmett L. Pinnell, Ph.D., Robert G. Robinson, Ph.D.

Animal Husbandry—Professors Evan F. Ferrin, M.Agr., Lester E. Hanson, Ph.D., Alfred L. Harvey, Ph.D., Laurence M. Winters, Ph.D.; Associate Professors Philip A. Anderson, B.S., John N. Cummings, Ph.D.; Assistant Professor Raymond M. Anderson, Ph.D.; Instructors Woodrow J. Aunan, M.S., Frank M. Crane, M.S., William E. Rempel, M.S.

* On active duty, U.S. Air Force.

Dairy Husbandry—Professors James B. Fitch, M.S., Willes B. Combs, M.A., Samuel T. Coulter, Ph.D., Thor W. Gullickson, Ph.D., Harold Macy, Ph.D., William E. Petersen, Ph.D.; Associate Professors Marshall C. Hervey, Ph.D., James J. Jezeski, Ph.D., Joseph C. Olson, Ph.D.; Instructors Lewellyn S. Mix, B.S., Howard A. Morris, M.S., Elmer Thomas, Ph.D.

Entomology and Economic Zoology—Professors Clarence E. Mickel, Ph.D., Alexander A. Granovsky, Ph.D., Alexander C. Hodson, Ph.D., William H. Marshall, Ph.D., A. Glenn Richards, Ph.D.; Associate Professors Mykola H. Haydak, Ph.D., Lloyd L. Smith, Ph.D.; Assistant Professors Torfine L. Aamodt, Ph.D., James R. Beer, Ph.D., Albert L. Burroughs, Ph.D., Laurence K. Cutkomp, B.S.; Instructor Edwin F. Cook, Ph.D.

Forestry—Professors Frank H. Kaufert, Ph.D., John H. Allison, M.F., Thorvald Schantz-Hansen, Ph.D., Henry Schmitz, Ph.D.; Associate Professors Randolph M. Brown, M.F., Henry L. Hansen, Ph.D., Ralph L. Hossfeld, Ph.D., Louis W. Rees, Ph.D., A. E. Schneider, M.A., Stephen H. Spurr, Ph.D.; Assistant Professor Donald P. Duncan, Ph.D.; Instructors Otis F. Hall, M.F., Arne Kemp, M.F., Carl H. Stoltenberg, M.F., Yale Weinstein, B.S.

Home Economics—Professors Louise A. Stedman, Ph.D., Alice Biester, M.S., Jane M. Leichsenring, Ph.D., Isabel Noble, Ph.D., Ethel L. Phelps, M.S.; Associate Professor Miriam G. Scholl, M.A.; Assistant Professors Gertrude Esteros, M.A., Ethel R. Gorham, M.A., Kathleen Jeary, M.A., Helen Ludwig, M.A., Esther Trammell, M.S.; Instructors Dorothy Bonnell, B.S., Mary Ellen Carlson, B.S., Joan Gordon, M.S., Elaine Hermanson, B.S., Naurine Higgins, B.S., Evelyn Jones, M.S., Lois Lund, B.S., Juliette Myren, M.S., Mavis Nymon, M.S., Neva Peterson, M.S., Beth B. Quist, B.S., Helen K. Stephens, B.S., Sue Theis, M.S.

Home Economics Education—Professors Louise A. Stedman, Ph.D., Clara Brown Arny, M.A., Ella J. Rose, Ph.D.; Associate Professor Roxana R. Ford, M.S.; Assistant Professor Hedda Kafka, M.A.; Instructors Ann Juilfs, M.S., Elvira Thomson, M.S.

Horticulture—Professors William H. Alderman, B.S.A., Wilfred G. Brierley, Ph.D., Troy M. Currence, Ph.D., Fred A. Krantz, Ph.D.; Associate Professors Arthur E. Hutchins, Ph.D., Theodore Weir, M.S., Arthur N. Wilcox, Ph.D., James D. Winter, M.S.; Assistant Professors Robert E. Nylund, Ph.D., Robert A. Phillips, M.S.; Instructor Richard E. Widmer, M.S.

Plant Pathology and Botany—Professors Elvin C. Stakman, Ph.D., D.Sc., Clyde M. Christensen, Ph.D., Jonas J. Christensen, Ph.D., Carl J. Eide, Ph.D., Helen Hart, Ph.D.; Associate Professor Milton F. Kernkamp, Ph.D.; Assistant Professors Louise Dodsall, Ph.D., Thomas H. King, Ph.D., Raymond H. Landon, Ph.D., Alvin H. Larson, B.S.; Instructors David W. French, M.S., Harold G. Heggeness, M.S., Thor Kommedahl, M.S., Matthew W. Moore, M.S.

Poultry Husbandry—Professor Hubert J. Sloan, Ph.D.; Associate Professors Thomas H. Canfield, M.S., Robert N. Shoffner, Ph.D.

Rhetoric—Professor Ralph G. Nichols, Ph.D.; Associate Professors James I. Brown, Ph.D., Marjorie H. Thurston, Ph.D.; Assistant Professors Francis E. Drake, Ph.D., Donald Woods, Ph.D.; Instructors Thomas F. Gossett, M.S., Paul S. Hagen, M.A., Arnold G. Nelson, M.A., Delmer J. Rodabaugh, M.A., William R. Rosegrant, M.A., Alvar B. Sandquist, M.A., David W. Shepard, M.A., Eugene S. Wright, M.A.

Soils—Professors Clayton O. Rost, Ph.D., Paul M. Burson, M.S., Paul R. McMiller, M.S.; Associate Professors Alfred C. Caldwell, Ph.D., John M. MacGregor, Ph.D.; Instructor Harold F. Arneman, Ph.D.

Veterinary Medicine—Professors Willard L. Boyd, D.V.S., John N. Campbell, D.V.S., Reuel Fenstermacher, D.V.M., Allan Hemingway, Ph.D., Howard C. H. Kernkamp, D.V.M., M.S., Benjamin S. Pomeroy, D.V.M., Ph.D., Martin H. Roepke, Ph.D.; Associate Professors Henry J. Griffiths, D.V.M., Ph.D., Ralph L. Kitchell, D.V.M., Ph.D., Robert A. Merrill, D.V.M., Jay H. Sautter, D.V.M., Ph.D., A. F. Sellers, D.V.M., Ph.D.; Assistant Professors Harvey H. Hoyt, D.V.M., Ph.D., Alvin F. Weber, D.V.M., Ph.D.; Instructors John P. Arnold, D.V.M., M.S., David E. Bartlett, D.V.M., Reid B. England, D.V.M., Jean C. Flint, D.V.M., M.S., John F. Henry, D.V.M., William R. Hess, M.S., Donald G. Low, D.V.M., Winston A. Malmquist, D.V.M., George W. Mather, D.V.M., Kenneth F. Moist, D.V.M., Gabriel G. Nahas, M.D., M.S., William R. Pritchard, D.V.M., Carl E. Rehfeld, D.V.M., Francis A. Spurrell, D.V.M., Clarence M. Stowe, D.V.M., Calvin C. Turbes, D.V.M., M.S.

I. General Information

THE ST. PAUL CAMPUS of the University of Minnesota is situated in a semirural environment just outside the city limits of St. Paul in the area east of Cleveland and north of Como Avenues. Of the 522 acres belonging to the University in this area about 63 acres comprise the campus proper, and the rest are used for agricultural experimentation.

During the week an intercampus street car runs between the St. Paul Campus and the Minneapolis Campus. Students registered in this college are given a free pass for use on this car.

Besides the College of Agriculture, Forestry, Home Economics, and Veterinary Medicine, the School of Agriculture, St. Paul, is located on the campus. Also on the campus are the administrative offices of the Agricultural Experiment Station and the Agricultural Extension Service of the University of Minnesota.

The dean of the Department of Agriculture of the University of Minnesota has his administrative offices in 201 Coffey Hall.

SCHOOLS OF AGRICULTURE

In addition to the various programs of collegiate instruction described in this bulletin, the University of Minnesota, in its Schools of Agriculture at St. Paul, Morris, Crookston, and Grand Rapids, offers systematic training at other levels to prospective farmers and homemakers. The admission requirements of the several schools vary.

The program of study of the School of Agriculture, St. Paul, has been adapted primarily to meet the needs of high school graduates and more mature farm youth who may not have completed high school. Meaningful educational programs for both men and women are available. Further infor-

mation may be obtained by writing to the Superintendent, School of Agriculture, University Farm, St. Paul 1, Minnesota.

The programs of study of the West Central, Northwest, and North Central Schools of Agriculture at Morris, Crookston, and Grand Rapids, respectively, have been adapted to meet the needs of rural boys and girls who have not been graduated from high school, but special arrangements are made to meet the needs of high school graduates. Information concerning these schools may be obtained by writing to the superintendents of the respective schools.

ADMISSION TO THE COLLEGE

To be admitted to this college you must make application to the Office of Admissions and Records, University of Minnesota, University Farm, St. Paul 1. Detailed information about admission is included in the Bulletin of General Information of the University. The following summarizes the requirements for entering students.

High School Graduates—If you graduated in the upper 75 per cent of your class, you are expected to meet the requirements for admission as published in the Bulletin of General Information. If you graduated in the upper 25 per cent of your class, you

will be considered for admission without regard to your pattern of high school courses completed. However, if you plan to do work in agriculture or forestry, it is suggested that you complete a major in English and minors in mathematics and science.

Graduates of the Schools of Agriculture—Graduates of the School of Agriculture, St. Paul, will be considered on an individual basis. If you are a graduate of one of the other Schools of Agriculture and have completed the four-year program and three summers of supervised project work or the equivalent, and if you were in the

upper 75 per cent of your class, you will be admitted to this college.

Adult Special Students—You may be admitted as a special student if you are a mature person (24 years or older) and wish to register for particular courses to meet special needs. Normally, an adult special student will not be in residence for an extended period of time, but only so long as is necessary to secure the information that is specifically desired.

Non-High School Graduates—Write to the Office of Admissions and Records for information about entering the University by examination. Also, see Bulletin of General Information, page 8.

Admission with Advanced Standing—Credits from other accredited colleges and universities can be transferred to the University of Minnesota. These will be evaluated by the Office of Admissions and Records and will be designated as either required or elective credit. A course that is applied toward required credit is considered the equivalent of a specific course required in a curriculum here. You will be expected to complete all required courses here and all area requirements regardless of the number of excess elective credits you may have.

Therefore it is important, if you know that you will be transferring to the University, to choose courses carefully so that they will apply toward the particular curriculum you expect to enter. In Section II of this bulletin you will find a description of the curricula and a listing of the required courses for each. You should note especially the requirements for the freshman and sophomore years. Your Junior College adviser will help you select courses that will meet specific curricular requirements, and if you need further help you may write directly to the Office of Admissions and Records, University Farm, St. Paul 1, Minnesota.

Admission to Curricula with Special Scholarship Requirements—Certain curricula require higher scholastic aptitudes and achievement than others. Admission to the college does not mean, therefore, that you will neces-

sarily be admitted to any curriculum you may select. When you first enter the University whether you will be permitted to register in a curriculum having special scholarship requirements will depend upon the results of the freshman orientation tests. If you are denied admission to a curriculum at first, you can transfer to it later if your scholastic record justifies it. Continuance in the curriculum will depend upon your maintaining the required scholastic average.

Transfer students may, upon entrance, be permitted to register in one of these special curricula, but continuance in it will depend upon the maintenance of the required scholastic average.

The special scholarship requirements are included in the description of curricula in Section II.

Examinations upon Entrance—If you are a new student you will be required to take a college aptitude examination provided you did not take it in high school. Other examinations given at entrance will test your aptitude and achievement in science, mathematics, and English. Your admission to the University will not depend upon the results of these examinations if you are otherwise qualified.

Exemption Examinations in Introductory Courses—The college desires to correlate the courses taught here, so far as possible, with the technical courses in agriculture taught elsewhere. If you have previously taken considerable work in technical courses, it may be unnecessary for you to repeat all or even part of it.

Satisfactory performance on exemption examinations in selected introductory courses will permit you to substitute elective credit for these courses. This is possible for Agronomy 1, Animal Husbandry 1, Dairy Husbandry 1, and Horticulture 1. Such exemption examinations must be taken during the first six weeks of your residence on this campus. You must petition for the privilege of taking an examination, and the petition must be approved by your adviser, the division concerned, and the Students' Work Committee.

For information about taking examinations for credit see page 11.

REGISTRATION AND CLASS ATTENDANCE

Registration—The Office of Admissions and Records announces the registration dates for each quarter. If you

are accepted for admission, the dates for registering and detailed instructions will be included in the informa-

tion that is sent to you. Students in residence are informed through the Official Daily Bulletin of the registration dates for each quarter.

Courses Taken on the Minneapolis Campus—Students who are enrolled on the St. Paul Campus register for courses, both required and elective, on the Minneapolis Campus. The courses from other colleges of the University that are required in particular curricula in this college are listed in Section II. The many other courses that are available as electives are not listed.

For a complete listing and brief descriptions of courses on the Minneapolis Campus it will be necessary for you to consult the bulletin of the particular college offering the course. The bulletins that will be of the most importance to you, depending upon your curriculum, will be the Bulletin of the College of Science, Literature, and the Arts, the Bulletin of the Institute of Technology, and the Bulletin of the General College. Your adviser will have a copy of these bulletins, and they will be available also at the Office of Admissions and Records and the Agriculture Library.

Quantity of Work—The normal load of work for each quarter is 14 to 18 credit hours. A credit hour requires on the average three hours each week. These may be distributed as follows: one hour of lecture or recitation requiring two hours of preparation; two laboratory periods requiring one hour of preparation; or three laboratory periods requiring no outside preparation.

To carry up to three hours of extra credit you must have a C average (that is, a total honor point average of not less than 1.0). To carry more than 21 hours you must have a B average (a total honor point average of not less than 2.0) and must secure special permission from the Students' Work Committee.

Auditors—The approval of the Students' Work Committee is necessary if you wish to register for a course as an auditor. An auditor must enroll officially for a course and must pay the same fee that is charged for regular membership in the class. He does not take the final examination and is not given a grade or credit for the course.

Changes in Registration—To change your registration you must obtain cancel-add forms from the Office of Admissions and Records. Changes should be made only when necessary

or highly desirable, and they should be made as early as possible in a quarter.

During the first six weeks you may cancel a course without grade and with only your adviser's approval. After the sixth calendar week you are required to have the approval of your adviser, your instructor, and the Students' Work Committee. The instructor must indicate your grade at the time of cancellation. If the grade is passing, you will be permitted to cancel with W on your report, or without grade. If it is failing, this is indicated by a grade of Z. A student who is doing failing work and discontinues attending class after the sixth week but does not officially cancel will also receive a grade of Z.

During the first week of the quarter you may add a course with the approval of your adviser only. After the first week you must have the approval of your adviser, your instructor, and the Students' Work Committee.

Cancellation of Entire Registration—If you leave college before the end of the quarter, you should cancel your registration at the time you discontinue attending class. Cancellation within the first six weeks entitles you to a refund proportional to the amount of time you attended class. If you do not attend classes at all, you are entitled to a full refund.

Class Attendance—On the St. Paul Campus attendance at class is not compulsory; consequently you need not present an official excuse to the instructor for absence from class. If you missed class for good reasons beyond your control, you have the privilege of requesting your instructor's assistance in making up the class work you missed. The instructor is under no obligation, however, to give assistance if you willfully or deliberately absented yourself from class, although there are situations in which he may properly wish to do so.

The following situations will be accepted by instructors as reasons that would justify absence from class and a request for assistance in making up work: (1) illness certified by the Health Service or the family physician; (2) emergencies caused by a death or serious illness in the immediate family; (3) emergencies approved by the Students' Work Committee; (4) participation in university-approved, noncurricular activities. (Certification that a

student was absent from class because he was engaged in such activities will be made by the dean of students.)

If you wish to make up work you should confer directly with your instructor in regard to the justification

for your absence and the possibility and ways of making up the class work. The Students' Work Committee will enter into the situation only when special emergencies (item 3 above) are involved and as an appeal agency.

SCHOLARSHIP REQUIREMENTS

Grades—If you do passing work in a course, you will be given one of four passing grades: A, B, C, and D. The grade of C indicates that your work was of average quality; B and A indicate higher levels of achievement; D denotes work of inferior quality.

The grade of I (incomplete) is a temporary grade indicating that you had a satisfactory record in work completed, but for reasons satisfactory to the instructor did not complete the work of the course. If you are given this grade, you must complete the work during the first 30 days of your next quarter in residence. When this is not done, the I is changed to canceled without grade. Prior to the end of the 30-day period an extension of time may be granted for the removal of the incomplete if this is recommended by the instructor and approved by the Students' Work Committee.

Three other letters may be used to report your performance in a course. The letter W reports cancellation without grade. The notation Y will be used: (1) if you do not attend class at all; (2) if you discontinue before the end of the sixth calendar week of classes but do not cancel; or (3) if you discontinue after the sixth calendar week but were not failing. The letter Z will be reported: (1) if you cancel after the sixth calendar week of classes with a failing grade, or (2) if you discontinue after the sixth week and were failing.

Honor Points—To measure quality of work, honor points are assigned to grades as follows: each credit of A, 3 points; each credit of B, 2 points; each credit of C, 1 point. The grades D, F, and Z do not carry honor points. To compute your honor point ratio, add the total number of honor points earned and divide by the total number of credits passed plus credits of F and Z plus credits of F and Z in courses that have been repeated. Disregard grades of I and Y.

In all curricula a minimum honor point average of 1.0 is required if you

are to make satisfactory progress toward a degree. In some curricula, as will be indicated in Section II, a higher honor point average is required.

Quality Credits—The number of free elective credits required for graduation may be decreased by one for each 5 honor points in excess of those required to reach an average of 1.7. Free electives are those you may choose without regard to curricular or all-college requirements. Not more than one twelfth of the total number of credits required for graduation may be gained through excess honor points.

Probation—If your scholastic work should be considerably below a satisfactory level of performance, you will be placed on probation and your program of work will be restricted as seems advisable to the Students' Work Committee.

You will be placed on probation if, at the end of three quarters of work or earlier, you have not attained an honor point average of .75. At the end of six quarters or earlier you will be placed on probation if you have not attained an honor point average of 0.9.

Dropped—If it should become apparent that your work is of a quality that will not lead to graduation, you will be dropped and will not normally be permitted to apply for readmission until nine months later.

A freshman is dropped when his honor point ratio is less than 0.5 after two or three quarters of work in this college. A sophomore is dropped if his average is less than .75 after six quarters, or five if he began his freshman work in the winter or spring quarter. When the factors which contributed to the unsatisfactory work have been removed or satisfactorily corrected, a student may petition for permission to return. Otherwise, he is encouraged to make other plans.

Readmission—If you should be dropped, you may not return without the permission of the Students' Work Committee. Credits earned at other institutions during the period of sus-

pension will not apply toward graduation from this college unless permission to earn such credits was given in advance by the Students' Work Com-

mittee. If you are permitted to return, you will be placed on probation and may be dropped again at any time when your work is unsatisfactory.

CLASSIFICATION OF STUDENTS

Sophomore—If you are within 18 credits of the number usually earned in your curriculum for the first year and if you have completed three quarters of college work, you will be classified as a sophomore. The three quarters may include time spent at another institution of collegiate rank. If you complete 90 credits with an honor point average of less than 1.0 but more than .75, you will be permitted to register for junior-senior courses only with the approval of your adviser and the Students' Work Committee. In no case will you be permitted to register for courses numbered 100 or above for which graduate credit is given. A sophomore who lacks 12 credits of being a junior

and who has a B average may be permitted to register for courses in the 100 group.

Junior—A total of 90 credits with an honor point average of at least 1.0 is required for junior classification.

Senior—To be classified as a senior, you must not be more than 9 credits short of the number required for the first three years in your curriculum.

Transfer Students—If you transfer from a college outside the University and enter this college as a junior, you should have an honor point average of not less than 1.0 at the end of your first year. If you do not have this average, you will be classified as a sophomore.

SPECIAL REQUIREMENTS AND EXEMPTIONS

Orientation—During your first quarter on this campus you are required to attend orientation lectures, unless you are a transfer with a year or more of work in another college.

Communications—If you are a beginning student or a transfer with less than 9 hours of credit in Freshman English (or Communications) from another college, you are required to take tests during the first week of the quarter of your proficiency in the four communication skills of listening, reading, speaking, and writing. Your assignment to a communications course and possible exemption from some of the freshman work will depend upon the results of these tests. Information as to the time and place for the tests will be included in the instructions you receive when you register, and inquiries can also be made in the Division of Rhetoric, 309 Agricultural Engineering Building. It is important to report promptly for all of these tests so that you can be programmed for a specific course by the second week of the quarter.

Mathematics Requirement—In curricula where only 5 credits of mathematics are required (that is, Technical Agriculture and Agricultural Education), you may meet the requirement by presenting one full year of high school credit in advanced algebra or

by completing one of the following courses: Math. 1, Higher Algebra (5 cred.); or Ag.En. 11, Applied Mathematics (5 cred.). If you present only one-half year of high school credit in advanced algebra, you must complete 5 credits in college. If you offer more than one-half year of high school algebra for entrance, you may not take Math. 1 for credit.

In a curriculum requiring mathematics through trigonometry you will be permitted to register for trigonometry if you present either one-half or one full year of high school credit in advanced algebra but not in trigonometry. If you present for admission both advanced algebra and trigonometry, with a grade of B or better in trigonometry, you will not be required to take higher algebra and trigonometry, but may repeat trigonometry for credit if you wish. If you received a grade of less than B in high school trigonometry, you must register for the course.

P.H. 3. Personal Health—Men students on this campus are required to take Public Health 3 or pass the exemption examination. This examination must be taken, however, during your first quarter in college. The date on which it is given is published each quarter in the Official Daily Bulletin.

The public health courses required

of women students in home economics vary somewhat with the different curricula and are listed there. Women registered in curricula in agriculture and forestry which include Public Health 3 must meet the requirement as stated in the preceding paragraph.

Students with military service records are exempted from the Public Health 3 requirement.

Social Science Requirement — For graduation from this college you must complete a total of not less than 18 credits in social science courses. These credits include those specifically required in your curriculum. Courses must be selected from at least three of the following departments or divisions: Agricultural Economics, Anthropology, Economics, Geography, History, Humanities, Philosophy, Political Science, Psychology, and Sociology. Other courses approved by the Curriculum Committee may also be used to meet this requirement. Technical courses such as accounting or statistics, psychology of learning, and physical geography may not be applied toward this requirement.

Exposition 51—Before you graduate from this college you must demonstrate proficiency in written composition. Most students satisfy this requirement by taking Exposition 51 during their junior or senior year. If your Fresh-

man English (or Communications) was above average, however, you may take an exemption examination which is given once a quarter at a time specified by the Division of Rhetoric. A course in advanced composition taken in some other college cannot be used to satisfy this requirement.

Physical Education—Men students on this campus are not required to take courses in physical education. Students registered in home economics are required to take a total of three credits in physical education. A woman student registered in agriculture, forestry, or veterinary medicine need not meet this requirement.

Credit without Class Attendance—If you wish to secure full credit for a course for which you have adequate training and preparation, you may apply for permission to take a **special examination**. It may be taken during the first six weeks of residence without fee; after that time, a fee of \$5 is required.

You may register for a course as a **reading course** with the approval of your adviser, the instructor in the course, and the Students' Work Committee. You will be expected to keep pace with the regularly enrolled class, however, and to complete the work of the course during the quarter in which you are registered for it.

RESERVE OFFICERS TRAINING CORPS

The University of Minnesota is a land-grant institution which offers instruction in military science and tactics in accordance with the provisions of the Morrill Act of 1862. Through cooperation with the Army, Navy, and Air Force it is possible for men students to qualify for a commission as a reserve officer at the same time that they complete their technical and professional training. Other students who may not wish to complete one of the training programs may register for part of the training and earn elective credits.

If you are a citizen of the United States and physically qualified, you should investigate thoroughly the opportunities that are offered in these programs. All of the programs comprise a four-year course of instruction and some summer training. If you are a veteran you will be given credit in the Army and Air program for all or part of the first two years of basic instruction. If you are a nonveteran you

should register for a program as early as possible in your freshman year so that you will have time to complete it before you graduate.

Elective credit is given for all of the courses in the training programs. During the first two years of the Army and Air programs one credit a quarter is given for three class hours of instruction a week; in the last two years three credits are given for five class hours. In the Naval Science program three credits a quarter are given for three class hours each week during the four years.

In the Army and Air programs you are furnished with uniforms and textbooks during the first two years. If you are accepted for advanced training you will be given a monthly monetary allowance and will be paid for summer training in addition.

The Naval Science program provides for two kinds of students, regular and contract. Regular students are selected on the basis of nation-wide competitive

examinations. The Navy provides tuition, fees, textbooks, uniforms, and a \$600-a-year living allowance. If you are selected for this program you are expected to complete it and, when you graduate, to accept a commission as ensign in the USN or second lieutenant in the USMC. You will also be required to serve on active duty for two years unless released earlier.

Contract students are civilians who enter into a contract with the Navy. If you wish to enter this program you must make a formal application for admission into it. If accepted, you will be provided with uniforms and textbooks during the first two years; during your junior and senior years you will be

paid a subsistence allowance. Upon completing the program you will be granted a commission as ensign in the USNR or as second lieutenant in the USMCR. If you desire, you may apply for a commission in the regular Navy or Marine Corps.

For more detailed information about these programs you should consult the Bulletin of General Information or the University Bulletin of the Army-Navy-Air ROTC. Also, you may make inquiries personally or by letter at the following offices in the University Armory: Military Science and Tactics, Room 106; Naval Science, Room 203; Air Science and Tactics, Room 5.

SENIOR COLLEGE PROGRAM

Specialization—In your sophomore year, after you have completed the equivalent of five quarters of residence, you are required to submit to the Office of Admissions and Records a specialization card which has been approved and signed by your adviser. On this card you indicate your choice of a major and a minor group or one of the outlined curricula. If this specialization card is not filed at the designated time, your registration may be withheld.

A **major** is a series of courses totaling from 24 to 36 credits chosen from one of the elective groups. A **minor** is a series totaling 18 credits (12 in the Science Specialization Curriculum) chosen also from one of the elective groups. Major and minor sequences cannot include courses which are specifically required in a curriculum.

The major or minor sequences or the outlined curriculum, as indicated on your specialization card, become your curriculum required for graduation. Copies of the approved curriculum are sent to you, to your adviser, and to the Students' Work Committee. In case the major is changed to a different field of work, a new adviser must be selected and your major and minor series reoutlined.

Electives—You should consult with your adviser as to your choice of limited and free electives. A **limited elective** is a course which is chosen from outside the field of your major or minor. It must not include courses specifically required in your curricu-

lum. A **free elective** may be chosen from any of the courses in the University for which you have completed the prerequisites.

You may omit elective courses with grades of D from the courses offered for graduation if this is approved by the Students' Work Committee.

A maximum of 9 credits in music may be used as elective credits toward graduation, with not more than 6 of these in Music 43, 44, 45, or Concert Band.

Not more than 9 credits in physical education may be counted toward graduation in curricula other than home economics.

Credit in the Graduate School—Credits for advanced courses earned while you are an undergraduate, even though in excess of those required for the baccalaureate degree, can be transferred to the Graduate School only under the following conditions: (1) If you lack not more than 9 credits of undergraduate work, taking into account required and sequence courses, you may carry a limited amount of graduate work (approved courses numbered above 99) for graduate credit, such courses not to be applied toward an undergraduate degree. The conditions as stated apply to the beginning of the quarter in which you are taking the courses for graduate credit. The transfer of credit must be arranged by petition to the Graduate School. (2) If you lack not more than 6 credits for graduation, taking into account required and sequence courses, you may register in the Graduate School.

GRADUATION

Degrees Offered—This college offers three groups of curricula with degrees granted as follows: (1) Four-year and five-year curricula leading to the degree of bachelor of science or other Bachelor's degree. (2) Fifth year leading to the professional Master's degree in agricultural education and home economics education. (3) Two-year preprofessional and four-year professional curriculum leading to the professional degree of doctor of veterinary medicine.

Requirements for Bachelor's degrees in Agriculture, Forestry, and Home Economics—Candidates will be recommended for graduation after completing the following requirements: (1) The prescribed curriculum including required and elective credits to make the total number of credits given in the table below. (2) An average of one honor point per credit—that is, 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—that is, Examination 51 or passing the exemption examination. (See page 11.) (4) A total of not less than 18 credits in social science courses. (See page 11.)

Students who are in certain of the combined curricula administered in other colleges need not complete 3 and 4 stated above. These combined curricula are as follows: (1) Agricultural Engineering (professional five-year course); (2) Agricultural Engineering Business Administration (five-year course); (3) Agricultural Journalism; and (4) Journalism with Home Economics major. Also, students in these curricula are not permitted to use excess honor points for credits.

Requirements for Bachelor's Degree in Veterinary Medicine—Candidates will be recommended for the bachelor of science degree, without designation, on completion of the following requirements: (1) Admission to the School of Veterinary Medicine. (2) Completion of the first two years of veterinary studies with an honor point average of 1.0 or above and a total cumulative average of 1.0 or above and a minimum of 192 credit hours of work. (3) Fulfillment of the all-college requirement of 18 hours of social science. (4) Completion of a minimum of 9 credit hours in rhetoric, including Rhet. 22, Public Speaking.

Summary of Credit Requirements—(See Tables 1 and 2.)

Table 1. Requirements for Bachelor's Degrees

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 five-year course)	253	Bachelor of agricultural engineering
Agricultural Engineering Business Administration	254	Bachelor of agricultural engineering and bachelor of business administration
Agricultural Extension	192	Bachelor of science
Agricultural Journalism	180	Bachelor of arts
Fishery and Wildlife Management	198	Bachelor of science
Food Technology	204	Bachelor of science
Forestry	204	Bachelor of science
Home Economics	185	Bachelor of science
Journalism-Home Economics (major)	180	Bachelor of arts
Science Specialization	192	Bachelor of science
Technical Agriculture	192	Bachelor of science
Veterinary Medicine	192	Bachelor of science

Table 2. Requirements for Professional Advanced Degrees

Course of Study	Four-year Credit Requirement (B.S. degree)	Fifth-year Credit Requirement	Degree Conferred
Agricultural Education	204	45	Master of education
Home Economics Education	185	45	Master of education
Veterinary Medicine— Two-year preprofessional and four-year professional curriculum			Doctor of veterinary medicine

Graduation with Honors—Undergraduate degrees may be awarded "with distinction" or "with high distinction." If you should fail to meet in full the requirements stated below, your case will be referred to the Students' Work Committee for individual consideration.

The degree is granted "with distinction" if you attain a minimum honor point average of 2.0 for the entire curriculum. If you are a transfer student with less than two years of work in this college you will not be eligible for graduation with distinction. However, if you complete one half the number of credits required for graduation in any curriculum, you will satisfy the two-year residence requirement. Recom-

mendations to the faculty for the degree with distinction are made through the Students' Work Committee on the basis of scholarship and other evidence of satisfactory achievement and advancement in the course pursued.

Your degree will be granted "with high distinction" if you attain a minimum honor point average of 2.5 for the entire curriculum. The same conditions for residence and recommendation apply as for the degree with distinction.

If you are completing the curriculum in Agricultural Education or Home Economics Education you will be checked for your standing in student teaching as well as for the requirements stated above.

THE STUDENT PERSONNEL PROGRAM

Faculty Advisers—In choosing your curriculum from the many different offerings in this college, you will be assisted by a member of the faculty who will become your adviser. Your adviser will interpret the program to you, will guide you in program planning, and will be concerned with your general progress. When you have problems and need special attention, your adviser may refer you to other faculty members, to one of the college administration, or to a specialized personnel agency.

Students' Work Committee—Almost every student has occasion from time to time to make use of the Students' Work Committee. This is a committee of the faculty which has authority to interpret and enforce faculty regulations. It also has the power to make exceptions to regulations when they work to the educational disadvantage of a particular student, provided the basic spirit of the regulation is maintained. If you have any questions concerning the interpretation of faculty regulations, you should consult with your adviser or with the dean of the college, who is chairman of the Stu-

dents' Work Committee. By means of petition, the forms for which are procured in the Office of Admissions and Records, you may request adjustments of your program where departure from normal procedures appears to be justified. These requests, after they have been approved by your adviser, are turned in to the college office.

Advanced Standing and Enrolment Committee—If you transfer to this college from another institution, your transfer credits are evaluated in the Office of Admissions and Records. You should see the assistant to the dean of Admissions and Records if you have any questions about the use of transfer credits. If necessary, you will be referred to members of the Advanced Standing and Enrolment Committee, which makes final decisions in evaluating transfer credits in terms of this college and the requirements of the various curricula.

Specialized Personnel Agencies—The personnel agencies listed below are available to you at any time. You may consult them with or without referral from your faculty adviser.

For professional help on a personal

problem or vocational choice, go to the Student Counseling Bureau, 101 Eddy Hall, Minneapolis Campus.

To learn about student activities, visit the Student Activities Bureau, 209 Eddy Hall, Minneapolis Campus, or to the St. Paul branch office in Room 125, Temporary Building South of Haecker Hall. The director of the University St. Paul Campus Union and the Student Union program consultants in 229 Coffman Union, Minneapolis Campus, are good sources of information.

If you need financial help, apply at the Bureau of Student Loans and Scholarships, 211 Eddy Hall, Minneapolis Campus.

For a part-time job on or off campus apply to the various division chiefs or to the Student Employment Office, 17 Administration Building, Minneapolis Campus.

For help in improving your reading or other study skills, consult the Rheto-

ric Division, Room 310 Agricultural Engineering Building, St. Paul Campus, or the Educational Skills Clinic, 101 Eddy Hall, Minneapolis Campus.

For aid with speech difficulties, consult the Rhetoric Division, or the Speech and Hearing Clinic, 20 Shevlin Hall, Minneapolis Campus.

If you have any questions about veterans' benefits, go to the Bureau of Veterans' Affairs, Room 135 Temporary South of Haecker.

Foreign students should keep in contact with the Adviser for Foreign Students, 302 Eddy Hall, Minneapolis Campus.

For help with health problems, go to the Students' Health Service on either the St. Paul or the Minneapolis Campus.

Textbooks and supplies can be purchased at the Agricultural Bookstore, 113 Coffey Hall.

STUDENT GOVERNMENT

Student Council—The council directs and coordinates student activities and encourages student leadership. Half of its members are chosen each year at spring elections conducted by the Board of Elections and Eligibility, a committee of the Student Council. Membership on the council is for a two-year term.

The council cooperates with the All-University Congress and the Senate

Committee on Student Affairs. It brings questions from the student body to the administration of the college and discusses and reaches decisions on matters of general interest.

Honor System—Under the provisions of the Student Self-Government Honor System, the students in this college, rather than the faculty, conduct examinations and quizzes. The honor system is operated on the assumption that



honesty prevails among a large majority of students. Students place themselves on their honor not to give or receive aid during examinations. The responsibility of honesty is between student and student; the faculty does not place the student on his honor. Under the honor system the faculty permits students to conduct the examinations.

If you should observe dishonesty during an examination period, you may take some appropriate step at the time to halt the dishonest act, or may report the incident later to the Honor Case Commission, a committee of the Student Council. The Honor Case Commission, comprised of students from the various divisions, considers confidentially the various aspects of the situation reported. If it is clear that scholastic dishonesty has occurred, the commission recommends to the Students' Work Committee of the faculty an appropriate penalty to be levied on the offending student.

The honor system is essentially a preventive, rather than a punitive, system and provides for great freedom of action on the part of students in this college. New students are urged to discuss the honor system with students previously registered in the college. The membership of the Honor Case Commission is posted in the post office, Coffey Hall, together with a notice as to how members may be contacted for information or assistance.

Student-Faculty Intermediary Board
—When you have questions or encounter situations with respect to your class work which in your opinion need attention or clarification, you are urged to bring your problem to the attention of the Student-Faculty Intermediary Board. This is a joint committee of students and faculty who are interested in maintaining helpful relationships between members of the student body and the faculty. The membership of this board is also posted in the St. Paul Campus post office.



STUDENT ACTIVITIES

The St. Paul Campus offers you a varied program of activities from which you may choose those that suit your individual interests and needs.

Social life centers largely in the Union, and numerous all-campus events are sponsored by the St. Paul Campus Union Board. This board, composed chiefly of students, also makes decisions about the use of the facilities of the Union.

Professional clubs and organizations will contribute to your knowledge of your special field and acquaint you with other students in your own and closely related fields.

Special interest groups enable you to improve in a skill or follow a hobby. Punchinello, a dramatics organization, the Toastmasters and Toastmistresses clubs, which give experience in public

speaking, and the Camera Club are typical of these organizations.

The churches near the campus have student programs with a part-time counselor or director. The YMCA and YWCA are interdenominational and open to all men and women on the campus. Each organization has a full-time director or secretary who assists students in planning and carrying out their program. The Student Council of Religions helps to coordinate the efforts of the various religious organizations on the campus.

St. Paul Campus students are entitled to use the facilities of the Coffman Memorial Union on the Minneapolis Campus. They may participate in activities on the Minneapolis Campus, if they wish, and of course they take part in all-university activities.

COLLEGE EXPENSES

Fees—For information about fees, see the Bulletin of General Information.

Housing—A limited number of women students are accommodated in the College Girls' Dormitory, St. Paul Campus. First priority is given to beginning freshmen, second priority to second- and third-quarter freshmen, and third priority to sophomores. Necessary bedding is provided and the bed linen is laundered. Residents may take their meals at the St. Paul Campus cafeteria. The preparation of food in dormitory rooms is prohibited. The dormitory is closed during vacations. Room rent must be paid by the quarter, in advance. For single rooms the charge per quarter is \$46; for double rooms, the charge is \$40 per occupant. A \$5 deposit is required at the time of signing a lease, and it is held during the period of residence. Inquiries about the dormitory should be directed to

the School of Agriculture, 205 Coffey Hall, University Farm, St. Paul 1, Minnesota.

A few men students are accommodated at the Old Home Dormitory. Inquiries about these accommodations should also be addressed to the School of Agriculture Office.

Rooming and boarding accommodations in approved houses are available near the campus. For information, write to the Housing Bureau, Temporary South of Haecker, University Farm, St. Paul 1, Minnesota.

Students from the St. Paul Campus may also apply for accommodations in the dormitories and cooperative houses on the Minneapolis Campus. For information about housing facilities there see the Bulletin of General Information and write to the Student Housing Bureau, 204 Eddy Hall, University of Minnesota, Minneapolis 14, Minnesota.

SCHOLARSHIPS AND AWARDS

Agricultural Faculty Women's Club Scholarships—Awarded to juniors or seniors in home economics on basis of character, scholarship, achievement, and financial need. Number and size of scholarships depend on funds and candidates available.

Alpha Zeta Scholarship—Annual scholarship of \$50 to male student on basis of scholarship, character, leadership, and promise of future service in agriculture or forestry. Recipient must have completed three quarters of work in this college and preferably not more than six.

Alpha Zeta Traveling Scholarship—Annual gift of \$150 to assist students of high scholarship and strong professional interests to attend a meeting of an appropriate professional, scientific, or technical society or association. Candidates must be upperclassmen and are nominated by chiefs of divisions. Awards are from \$25 to \$100.

Borden Agricultural Scholarship Award—Annual award of \$300 to student entering his senior year in agriculture who has achieved the highest average grade of all similarly classified students in agriculture

in all preceding college work. Recipient must have included in his curriculum two or more dairy subjects.

Borden Home Economics Scholarship Award—Similar award for senior student in home economics. The recipient must have included in her curriculum two or more courses in food and nutrition.

Mary L. Bull Scholarship—A fund of \$500 established by the Alpha Alumnae Chapter of Phi Upsilon Omicron, the interest to be used for special grants or scholarships to needy and worthy students enrolled in the courses in home economics.

Burpee Award in Horticulture—Annual award of \$100 to student, preferably a junior, in the regular four-year course in agriculture with a major in horticulture or its related fields. Award based on scholastic ability, practical experience, interest in flower and vegetable growing, promise of leadership, and character.

Caleb Dorr Scholarships and Medals—Awarded to students for the highest scholastic records, one for men and one for women, in each class—freshman, \$50; sophomore, \$100; junior, \$100; senior, gold medals.

Caleb Dorr Special Scholarships and Prizes—Books, pictures, and other suitable awards are presented to students who have had two or more quarters of work in the college and who have an honor point ratio of 2.5 or better.

Dean E. M. Freeman Scholarship Fund—Gift of the Alumni Association of the college, the income to be used for special achievement scholarships of not less than \$25 each to students who have made commendable progress in scholarship or student leadership and a significant achievement in self-support in the face of unusual financial or other obstacles.

Samuel B. Green Scholarship Medal—Awarded each year to the student in forestry having the best scholastic record at the end of the fall quarter of the senior year.

Home Economics Association Scholarship—Contribution of \$50 each year for a scholarship to a student in home economics to be awarded on the following basis: spirit of service, financial need, professional attitude, character, honor point ratio of 1.5 or above, and ideals and standards consistent with those set up by the School of Home Economics.

Oscar L. Mather Award—Interest from memorial fund is used to purchase a book each year to be awarded to the student in forestry displaying outstanding scholarship, leadership, and character.

Minneapolis Gas Light Company Service Scholarship—Gift of \$500 annually for a service scholarship to aid a qualified third quarter sophomore or junior in foods and business in home economics. Recipient must express willingness to consider employment later in the Home Service Department of the company for six months at a mutually agreed upon salary.

Minnesota Garden Flower Society Scholarship in Memory of Roger S. Mackintosh—Gift of \$100 annually as an aid to a qualified student in the regular four-year course in agriculture with a major or minor in horticulture, preferably floriculture. Award based on scholastic ability, interest in floriculture, promise of leadership, and character.

F. H. Peavey and Company, Van Dusen-Harrington Company Undergraduate Scholarship—Annual \$300 scholarship to aid a junior or senior qualified as follows: a graduate of a Minnesota high school, a major in college in agronomy, plant pathology, or soils, must have demonstrated a continuing interest in cereal crops in Minnesota, must have a satisfactory college record, and must be in need of financial aid to complete his college education.

Phi Upsilon Omicron Alumnae Scholarship—A \$50 scholarship annually from the Twin City Chapter to a student in home economics, preferably a freshman or sophomore. Awarded on basis of scholarship, personality, and public service.

Sears-Roebuck Agricultural Scholarships—(1) Freshman Scholarships: \$150 each to Minnesota farm boys who enroll as beginning freshmen in the agricultural course in this college. Basis of the award: promise of success in college, leadership, and financial need. (2) Sophomore Scholarship: \$200 to the outstanding student in the group of Sears-Roebuck freshman scholars of the previous year. (3) Junior Scholarship: A sophomore selected from the Sears-Roebuck scholars of the previous year will compete at the end of his sophomore year with candidates from other agricultural colleges of the United States for a junior scholarship.

Sears-Roebuck Home Economics Freshman Scholarships—Gift of \$600 yearly to provide three scholarships of \$200 each for rural girls in home economics. Basis of the award shall be need, scholastic aptitude, potentialities for leadership, and an expressed interest in home economics as a career, particularly in home economics education or home demonstration work.

Silver Anniversary Scholarship Fund—Contributions from the class of 1920 and the class of 1921 of this college made at their twenty-fifth anniversary reunion for scholarships or awards to students as recommended by the Scholarship Committee. Contributions from other classes will be added to this fund.

Florence Munson Wilson Fund—A trust fund has been established as a memorial to Mrs. Wilson by her husband, H. K. Wilson, formerly a professor of agronomy on this campus. The income is used to provide annual scholarships for men and women pursuing work in this college who have demonstrated a high quality of scholarship, personal character and integrity, and exceptional promise in his or her chosen field.

Gardner Cowles, Jr., WNAX Agricultural Scholarships—Scholarships of \$300 each awarded by the Cowles Broadcasting Company of Yankton, South Dakota, as an aid to a qualified farm boy and farm girl who have completed the freshman year in college creditably and intend to major in agriculture or home economics. Awards made on basis of scholarship, promise of leadership, character, and financial need.

Xi Sigma Pi Freshman Scholarship Recognition—The freshman in forestry with the highest scholastic rating has his name engraved on a permanent honor plaque in the Forestry Library.

All-University Scholarships—A number of scholarships open to all students of the University are administered by the Bureau of Student Loans and Scholarships, Minneapolis Campus.

Other Awards

Collegiate Crops Judging Team Fund—Contribution of \$1,000 from the F. H. Peavey and Company Agricultural Department, Minneapolis, for the purpose of supporting the Collegiate Crops Judging Team on their annual trip.

Caleb Dorr Special Achievement Awards—Extempore Speaking Contest, prizes of \$15, \$10, and \$5.

Dean E. M. Freeman Medal for Student Leadership—Award of a bronze medal to that senior student who has made the greatest contribution to student life during his or her period of residence on the campus.

Minnesota Dairy Technology Society—Contribution of \$565 from the Minnesota Dairy Technology Society for use by the Dairy Husbandry Division in financing the expenses of student judging teams (dairy cattle and dairy products) when competing in national contests.

Charles Lathrop Pack Prizes in Forestry—Prizes of \$30, \$20, and \$10 each year to

regularly enrolled undergraduate forestry students writing the best essays of a popular nature on forestry.

Ruedlinger Memorial Fund—Contribution from the Twin City Nurserymen's Association, the income to be used for a prize of \$25 (or less) to the undergraduate presenting the best paper on some horticultural subject.

O. A. Storvick Memorial Fund—Fund of \$2,000 from the National Creamery Butter-makers Association, the income and a stipulated fraction of the principal to be used: (1) for the presentation of medals to members of the Dairy Products Judging Team, and (2) for paying not to exceed one half the expense of sending a Dairy Products Judging Team to the Annual Dairy Products Judging Contest.

A. D. Wilson Prize—Income from memorial funds used for prizes in essay competition open to all regularly enrolled students on subjects usually in the field of agricultural cooperation.

II. Curricula

THIS SECTION of the bulletin describes the curricula offered in this college, lists required courses, and gives information about electives.

Course Listings—A listing for a course will appear as in the following example: Rhet. 22, Public Speaking, 3. Rhet. is an abbreviation for the name of the division offering the course; 22 is the number of the course among those offered in Rhetoric; Public Speaking is the title of the course; 3 indicates the number of credit hours. For more detailed information about the course, including the prerequisites for it, turn to Section III. Courses offered on the Minneapolis Campus are not described in this bulletin.

Numbering of Courses—Courses primarily for freshmen and sophomores are numbered 1 through 49; for juniors and seniors, 50 through 99; for juniors, seniors, and graduate students, 100 through 199.

Course Sequences—A course sequence separated by hyphens (51-52-53) must be taken in the order listed. Those separated by commas (51, 52, 53) need not be taken in that order.

CURRICULA IN AGRICULTURE

The curricula in agriculture provide collegiate training for a great variety of technical and professional positions. The requirements for each curriculum, the vocational possibilities offered by each, and the course of study are described in the material given below. The curricula are as follows: I. Technical Agriculture; II. Agricultural Education; III. Agricultural Education (Professional); IV. Agricultural Extension; V. Agricultural Business Administration; VI. Agricultural Journalism; VII. Agricultural Engineering; VIII. Agricultural Engineering Business Administration; IX. Food Technology; X. Fishery and Wildlife Management.

I. Technical Agriculture

The Technical Agriculture Curriculum offers general preparation leading to a variety of possible specializations. Normally more students are enrolled in this curriculum than in any of the other curricula in agriculture.

Students entering technical agriculture spend most of their first two years securing the background of information in science and agriculture and the skills in communication that are needed for advanced study.

After two years, though sometimes earlier, the student chooses a field in agriculture with which he wishes to become particularly well acquainted. He calls this field his major, and plans to earn at least 24 credits in courses offered by this division or in very closely related courses. He also selects

a minor field, which is usually related to the major or supplementary to it, and plans to earn at least 18 credits in this field. The greater part of his last two years is spent in completing the requirements for his major and minor specializations within the Technical Agriculture Curriculum.

A complete listing of the areas from which the student in technical agriculture may choose his major and minor fields is given on page 23. When a freshman entering the college knows the area in which he wishes to specialize at a future date, he may choose his faculty adviser from the faculty in the division concerned.

Vocational Opportunities—The vocational opportunities for graduates from this curriculum are too varied to per-

mit listing. They may differ from one area of specialization to another. 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. If a student wishes to enter graduate study or work in a highly specialized field, he may wish to consider other curricula in agriculture and should discuss his plans with the division concerned.

Among the vocations for which technical agriculture offers training are the following:

1. General farming and many kinds of specialized farming.

2. Industrial and commercial enterprises dealing with agricultural products such as creameries, meat packing plants, flour mills, canneries, feed products enterprises, and seed and plant nurseries.

3. Industrial and commercial enterprises dealing with products sold chiefly on farms, such as agricultural machinery, dairy and creamery supplies, feeds, insecticides, and seeds.

4. Business concerns that deal largely with rural people, such as cooperatives, banks, insurance companies, marketing organizations, and railroads.

5. A great variety of federal, state, and other governmental agencies and

bureaus, such as soil conservation, agricultural adjustment, inspection services, and extension programs.

6. A considerable variety of special jobs such as park and golf course supervisors, technicians in the manufacture and distribution of farm products, control of insect and plant pests, and seed production and improvement.

These are illustrative of the opportunities. Students interested in preparing to teach agriculture in the high schools should enroll in the Agricultural Education Curricula. The pretheological major in agriculture prepares for rural church work. Students interested in rural education are referred to the Bulletin of the College of Education.

Farm Experience—All students in technical agriculture should have at least six months' practical experience on a farm. When possible, this should be secured before a student enters the college program. If the farm experience of an entering student is not satisfactory, he will be required to obtain farm experience during his college course. Students who major in dairy husbandry must have at least three of the six months of approved farm experience on an accredited dairy farm or in a well organized dairy manufacturing plant.



GENERAL REQUIREMENTS

To graduate in technical agriculture the student must complete the all-college requirements for students in this college including the social science requirement of 18 credits. (See page 11.) In addition, the farm experience requirement must be satisfied, and 192 credit hours must be earned.

COURSE REQUIREMENTS

The courses listed below as required are considered fundamental and necessary to any training in technical agriculture and should, if possible, be completed before the end of the sophomore year. Some modification in the requirements may be permitted when the student has a definite objective for which substitutes for certain required courses appear desirable. To secure approval for substitutions, the student submits a petition to the Students' Work Committee accompanied by a recommendation from his adviser requesting the change.

If any of these courses are not completed in the first two years, they must be given precedence over other courses in the junior year. A student should plan his program well in advance so that time conflicts between courses will be eliminated. Since some courses are offered only one quarter each year, careful planning is necessary. In addition to the requirements listed, the student may be scheduled for the programs offered in the Army, Air, or Naval ROTC.

FRESHMAN YEAR—REQUIRED COURSES

In the courses starred below an exemption examination is possible for qualified students. (See page 7.)

- *Agro. 1, General Farm Crops, 3. (A student who expects to major in dairy products may substitute other cred. approved by adv.)
- *An.Hu. 1, Livestock Production, 4. (A student who expects to major in a special horticultural field may substitute elective cred. approved by the chief of the Division of Horticulture)
- Bot. 1-2, General Botany, 6.
- *Dy.Hu. 1, Elements of Dairying, 3. (A student who expects to major in a special horticultural field may substitute elective cred. approved by chief of the Division of Horticulture)
- *Hort. 1, General Horticulture, 3, or Hort. 6, Fruit Growing, 3, or Hort. 32, Vegetable Growing, 3. (A student who expects to major in dairy products may substitute other cred. approved by adv.)

- In.Ch. 1-2 or 4-5, General Inorganic Chemistry, 8
- Math. 1, Higher Algebra, 5, or Ag.En. 11, Applied Mathematics, 5 (See math. req., page 10. Credit permitted for only one of these courses)
- Orie 1, College Orientation Lectures, 1
- P.H. 3, Personal Health, 2 (See page 10)
- Rhet., Communications req.

SOPHOMORE YEAR—REQUIRED COURSES

1. Freshman courses not completed

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

- Ag.Bi. 1, Elementary Organic Chemistry, 5
- Ag.Bi. 3, Introduction to Biochemistry, 3
- Ag.Bi. 5, Plant Biochemistry, 3, or Ag.Bi. 6, Animal Biochemistry, 3
- Ag.Ec. 1-2, Principles of Economics I and II, 8
- Ag.En. 3 cred. selected from the following:
 - 3, Mechanical Drawing, 3; 6, Farm Buildings, 3; 12, Agricultural Machinery, 3; 13, Gas Engines and Tractors, 3; 31, Principles of Drainage, 3; 67, Rural Sanitation and Water Supply, 3. (Students with cred. in Ag.En. 54 are admitted to Ag.En. 12 or 13 by petition only. Those with cred. in Ag.En. 12 or 13 are admitted to Ag.En. 54 by petition only)
- Ag.En. 23, General Physics, 5. (Students with a year of high school physics may omit this course and substitute 5 cred. elective later in curriculum)
- Bact. 53, General Bacteriology, 5. (Not required of horticulture majors in landscape gardening)
- Ent. 5, Economic Entomology, 5
- For. 10, Farm Forestry, 3 (A student who expects to major in dairy products may substitute other cred. approved by adv.)
- Soil. 4, Soils, 3
- Zool. 14-15, General Zoology, 6

JUNIOR-SENIOR YEARS—REQUIRED COURSES

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

- Rhet. 22, Public Speaking, 3
- Rhet., 3 cred. selected from the following:
 - 12, Debate and Discussion, 3; 54, Advanced Public Speaking, 3; 31, English Literature I, 5; 32, English Literature II, 3; 33, American Life in American Literature, 3; 60, Contemporary Literature, 3
- Rhet. 51, Exposition, 3 (Cannot be taken earlier than the junior year)

ADDITIONAL REQUIREMENTS

Every student is required to file in the Office of Admissions and Records, by the end of his sophomore year, a specialization card on which he lists

the courses he proposes to take to complete his major and minor as well as limited electives. This card must be approved by his adviser. Changes from one curriculum to another after the sophomore year must be approved by the Students' Work Committee. Since the student is held responsible for all requirements of the curriculum he finally selects, late changes usually involve inconvenience and may perhaps add to the time required to achieve graduation. In the same way, changes in choice of major or minor or of courses listed in these fields on the specialization card which has been filed must be approved by the student's adviser and the Students' Work Committee.

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

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

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 in another field of work. Courses listed in limited electives may apply toward the second minor. Such a minor will be clearly outside the field of the major and the first minor and must be approved by the division of the second minor.

Courses from divisions or departments other than those offering the specialization or from other colleges of the University may be applied as major or minor credits if they are clearly related or fundamental to the major or minor specialization.

In addition to the major and minor specialization, the student must complete 18 credit hours of limited electives, which must be selected outside the groups from which the major or minor have been chosen in order to broaden the educational base. Those courses listed as specific requirements in the Technical Agriculture Curriculum may not be applied to the major or minor sequences or as limited electives.

SPECIALIZATIONS OFFERED

In the specializations starred below, majors in technical agriculture must secure approval of the division since a

major in these groups is usually selected under the Science Specialization Curriculum.

- *Agricultural Biochemistry
- Agricultural Economics (See also Agricultural Business Administration)
- Agricultural Education (minor only, on approval of the Department of Agricultural Education)
- Agronomy and Plant Genetics
 - a. Agronomy
 - b. *Plant Genetics
- Animal Husbandry
- Dairy Husbandry
 - a. Dairy Production
 - b. Dairy Products
- Entomology and Economic Zoology
 - a. *Entomology
 - b. Wildlife Management (minor only)
- Forestry (minor only)
- Horticulture
 - a. General Horticulture
 - b. Landscape Gardening
- Mechanized Farming (courses offered in the Division of Agricultural Engineering)
- *Plant Pathology and Botany
- Poultry Husbandry
- Soils

SPECIAL MAJORS AND MINORS

Agricultural Journalism (minor)—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 Husbandry, Dairy Husbandry, Poultry 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.

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

FRESHMAN-SOPHOMORE YEARS

With approval of adviser, certain General College courses 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: agricultural engineering, agronomy, animal husbandry, dairy husbandry, horticulture, poultry husbandry, soils, animal industry, plant industry. Students interested in a minor in home economics must secure approval of courses for such a minor from the director of the School of Home Economics.

Pretheological Major in Agriculture—This major, as defined by the Conference on Cooperation between Colleges of Agriculture and Theological Seminaries, must include at least one basic course in each of the following: agri-

cultural economics, English literature, history and government, philosophy, public speaking, psychology, rural sociology, and 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. Any student who desires to enroll in this major should consult the dean of the college and should plan carefully with his adviser in order to meet both the college and the pre-theological requirements.

II. Agricultural Education

This curriculum, offered jointly with the College of Education, is designed for students who plan to teach agriculture in the secondary schools and communities of Minnesota. It is also adapted to the needs of agricultural extension workers and others preparing to work in rural areas. It provides broad training in technical agriculture and permits emphasis upon such fields as dairying, agronomy, agricultural economics, horticulture, animal husbandry, or mechanized farming. In addition, it offers the special training in education needed to qualify students for certification as agriculture instructors in high schools.

During the first two years the student completes required work in the Agricultural Education Curriculum or the equivalent in other agricultural curricula. In his junior and senior years he completes a combined curriculum of the College of Education and the College of Agriculture, Forestry, Home Economics, and Veterinary Medicine, leading to a bachelor of science degree.

Students wishing to major in agricultural education must have lived on a farm until the age of sixteen or have had two full years of farm experience after that age.

For all-college requirements for students on this campus, see page 13.

An average honor point ratio of 1.5 is required in 18 courses out of those listed below:

Agricultural Economics 102, 103, and one elected course
 Agricultural Engineering 7, 41, 54, 55, 60, 67
 Agronomy 21, 23, 31
 Animal Husbandry 56, 57, 112, 113
 Dairy Husbandry 1, 103, and 5 elected credits

Entomology 5
 Horticulture 1 and one elected course or Forestry 10
 Plant Pathology 1, 3
 Poultry Husbandry 1 and one elected course
 Soils 4, 5
 Veterinary Medicine 52

FRESHMAN YEAR—REQUIRED COURSES

In the courses started below an exemption examination is possible for qualified students. (See page 7.)

Ag.Ed. 1, Introduction to Agricultural Education, 1
 Ag.En. 7, Farm Building Construction, 3
 Ag.En. 23, General Physics, 5 (not required of students with a year of high school physics)
 Ag.En. 41, Metal Work, 3
 *Agro. 1, General Farm Crops, 3
 *An.Hu. 1, Livestock Production, 4
 Bot. 1-2, General Botany, 6
 *Dy.Hu. 1, Elements of Dairying, 3
 Hort. 1, General Horticulture, 3
 In.Ch. 1-2 or 4-5, General Inorganic Chemistry, 8
 Math. 1, Higher Algebra, 5, or Ag.En. 11, Applied Mathematics, 5 (see math. requirement, page 10)
 Ori. 1, College Orientation Lectures, 1
 Rhet., Communications requirement

SOPHOMORE YEAR—REQUIRED COURSES

Ag.Bi. 1, Elementary Organic Chemistry, 5
 Ag.Ec. 1-2, Principles of Economics I and II, 8
 Ag.En. 67, Rural Sanitation and Water Supply, 3
 Agro. 31, Principles of Genetics, 4
 Bact. 53, General Bacteriology, 5
 Ed. 55B, Introduction to Secondary Training, 5
 Ent. 5, Economic Entomology, 5
 Po.Hu. 1, Poultry Production, 4
 P.H. 3, Personal Health, 2 (See page 10)
 Psy. A or 1-2, Psychology, 5 or 6
 Soil. 4, Soils, 3

Soil. 5, Soil Management, 3, or Soils 111, Field and Laboratory Studies of Soils, 3
Zoo'. 14-15, General Zoology, 6

JUNIOR YEAR—REQUIRED COURSES

1. **Fresh.-soph. courses not completed**
2. **Rhet. 51, Exposition, 3**
3. **Social Science requirements**
4. **Education courses**
Ag.Ed. 54, Rural Education and Community Leadership, 3
Ag.Ed. 56, Rural Education through Extension Methods, 3
Ag.Ed. 81, Teaching Agriculture, 3
Ag.Ed. 82, Methods in Teaching Agriculture, 3
5. **Agricultural courses**
Ag.Ec. 102, Farm Organization, 3
Ag.Ec. 103, Farm Operation, 3
Ag.En. 55, Electricity in Agriculture, 2
Agro. 21, Grain Crops, 4
An.Hu. 56, Livestock Feeding I, 3
An.Hu. 57, Livestock Feeding II, 3, or Dy.Hu. 103, Dairy Stock Feeding, 3
Pl.Pa. 1, Plant Pathology, 5
Pl.Pa. 3, Weeds, 3
Rhet. 22, Public Speaking, 3
Ve.Me. 52, Anatomy, Physiology, and Hygiene of Domestic Animals, 3

SENIOR YEAR—REQUIRED COURSES

1. **Education courses**
Ag.Ed. 91, Supervised Teaching Experience, 6
Ag.Ed. 101, Young Farmer Education in Agriculture, 2
Ag.Ed. 102, Adult Education in Agriculture, 2
Ag.Ed. 103, Methods of Instruction in Mechanized Farming, 3
Ag.Ed. 104, Planning Programs, 2

2. **Agricultural courses**
Ag.En. 54, Farm Power and Machinery, 4
Ag.En. 60, Introduction to Soil and Water Control, 4, or Soils 103, Principles of Soil Erosion, 3
Agro. 23, Forage Crops, 4
An.Hu. 112, Animal Breeding, 3, or An.Hu. 113, Livestock Management, 3
Rhet. 51, Exposition, 3
Soc. 14, Rural Sociology, 3

ELECTIVES RECOMMENDED TO MEET AREA REQUIREMENTS

- Agricultural Economics, 3 cred. Courses 8, 40, 50, 80, 144
Animal Husbandry, 3 cred. Courses 8, 9
Dairy Husbandry, 5 cred. Courses 3, 9, 52, 101
Horticulture, 3 cred. Courses 21, 22, 32, 40, 135, or Forestry 10
Poultry Husbandry, 3 cred. Course 52

ELECTIVE COURSES FOR STUDENTS IN ROTC

Ag.En. 7, Pl.Pa. 3, Soils 5, Ve.Me. 52

ADDITIONAL ELECTIVES RECOMMENDED

- Agronomy 22, 126, 133
Educational Psychology 120, 133
Agricultural Journalism 53
Rhetoric 12
Rural Sociology 161

RURAL EDUCATION

A curriculum in Rural Education designed to prepare students for teaching in rural schools is administered by the College of Education. For detailed information about this curriculum see the Bulletin of the College of Education.

III. Agricultural Education (Professional)

FIFTH YEAR LEADING TO PROFESSIONAL DEGREE

The College of Education and the College of Agriculture, Forestry, Home Economics, and Veterinary Medicine will award the master of education (M.Ed.) degree 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.

Undergraduates who expect to qual-

ify for the M.Ed. degree should confer with their advisers by the beginning of the junior year so that the work of the junior, senior, and fifth years may be coordinated to best advantage.

The requirements that must be completed for the professional degree are stated in the Bulletin of the College of Education.

IV. Agricultural Extension

This training prepares students to become agricultural county agents, extension specialists, boys' and girls' club leaders, or to enter other specialties in agricultural extension.

Because of the wide range of possible major and minor specializations, a formal curriculum for training in agricultural extension has not been outlined. The college does offer opportuni-

ties, however, for an adequate training in many branches of this field. Any student desiring such training may formulate a suitable program under the general curricular requirements of technical agriculture or agricultural education.

Students planning to enter agricultural extension can best prepare for it by selecting some major field and arranging for their extension training in the selection of their minor groups or of electives in consultation with advisers. For example, the major field may be agricultural education or one of the technical divisions of agriculture, such as animal husbandry, dairy husbandry, or agronomy. 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 he may have as to a continuation of his study and professional development after he has become engaged in extension work.

Agricultural extension involves the educational presentation and promotion of agricultural information and practices. It should be founded primarily on a thorough knowledge of some field of technical agriculture and a general knowledge of the total field. The methods used will vary with the different extension jobs.

A major adviser should be selected in the student's major field. It is advisable for each student to select a second adviser from the extension staff.

For the benefit of interested 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.

V. Agricultural Business Administration

This curriculum is offered jointly with the School of Business Administration. It is designed for those who wish to prepare for some branch of agricultural business such as the marketing of farm products, finance, implements, farm real estate, and country merchandising. More opportunity is offered for business and economics courses than in the Technical Agriculture curriculum, where greater stress is on the agricultural subjects. Students completing the curriculum will receive

SUGGESTED COURSES FOR AGRICULTURAL EXTENSION

- Ag.Ec. 40, Principles of Marketing Organization; 80, Farm Accounting; 102, Farm Organization; 103, Farm Operation
- Ag.Ed. 54, Rural Education and Community Leadership; 56, Rural Education through Extension Methods; 102, Adult Education in Agriculture
- Ag.En. 6, Farm Buildings; 7, Farm Building Construction; 60, Introduction to Soil and Water Control; 67, Rural Sanitation and Water Supply
- Ag.Jo. 53, Publicity
- Agro. and Pl.Ge. 1, General Farm Crops; 21, Grain Crops; 23, Forage Crops; 31, Principles of Genetics; 133, Pasture Crops and Management; 135, Weed Control
- An.Hu. 1, Livestock Production; 8, Breeds of Livestock; 56, Livestock Feeding I; 57, Livestock Feeding II; 112, Animal Breeding; 113, Livestock Management
- Dy.Hu. 1, Elements of Dairying; 101, Milk Production; 103, Dairy Stock Feeding; 104, Dairy Stock Selection; 52, Dairy Herd Management
- Ed. 55B, Introduction to Secondary School Teaching; Ed.C.I. 105, Audio-Visual Aids in Teaching
- En. and Ec.Zo. 5, Economic Entomology
- For. 10, Farm Forestry
- Hort. 1, General Horticulture; 40, Horticultural Laboratory
- Pl.Pa. and Bot. 1, Plant Pathology; 3, Weeds
- Po.Hu. 1, Poultry Production; 153, Poultry Nutrition and Feeding
- Rhet. 12, Debate and Discussion; 22, Public Speaking; 54, Advanced Public Speaking
- Soil. 5, Soil Management; 111, Field and Laboratory Studies of Soils

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

- Pol.Sci. 1-2-3, American Government and Politics; 9-10, Fundamentals of Government and Politics
- Psychology A, Elementary Psychology, or 1-2, General Psychology
- Sociology and Social Work 14, Rural Sociology; 160, Rural Community Organization; 161, Rural Community Analysis; 162, Rural Social Institutions

the degree of bachelor of agricultural business administration.

In the first two years students register and pay fees in this college. In the last two years they register in this college and in the School of Business Administration and pay the fees of the latter.

The first two years of the curriculum are prescribed and include introductory courses in agriculture, economics, and fundamental sciences. At least 90 credits and an honor point average of 1.0

are required for admission to the junior class. 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.

Students must meet the all-college requirements for graduation from this college. (See page 13.)

FRESHMAN YEAR

Students take the regular freshman courses outlined in the Technical Agriculture curriculum, except that they are advised to register for Math. 8 rather than Ag.En. 11; or Math. 1 if they do not have the prerequisites for Math. 8. If any course is deferred until the sophomore year it should be An. Hu. 1.

SOPHOMORE YEAR

1. Freshman courses not completed
2. General courses required
 - Ag.Ec. 1-2, Principles of Economics I and II, 8
 - Ag.Ec. 8, Rural Economics, 3
 - Ag.Ec. 50, Farm Finance, 5
 - Econ. 24-25-26, Principles of Accounting, 9
 - Ent. 5, Economic Entomology, 5
 - Psy. 1-2, General Psychology, 6
 - Rhet. 22, Public Speaking, 3
 - Zool. 14-15, General Zoology, 6
3. Electives—Enough elective cred. to bring the total to 101 cred. hrs.

JUNIOR YEAR

1. General requirements
 - B.A. 51, and 52 or 53, Business Law, 6
 - Econ. 64, Economics of Money and Banking, 3
2. Special requirements
 - Ag.Ec. 30, Agricultural Prices, 3
 - Ag.Ec. 40, Principles of Marketing Organization, 3
 - Ag.Ec. 90, Agricultural Statistics, 5
 - Ag.Ec. 110, Economics of Agricultural Production, 3
 - Ag.Ec. 131, Market Prices, 3
 - Ag.Ec. 140, Marketing Organization: Staples, 3; or Ag.Ec. 141, Marketing Organization: Dairy and Poultry Products, 3; or Ag.Ec. 143, Marketing Organization: Livestock and Meats, 3
 - Rhet. 51, Exposition, 3

SENIOR YEAR

1. General requirements
 - B.A. 58, Elements of Public Finance, 3
 - B.A. 71, Transportation: Services and Charges I, 3
 - Econ. 80-81, Intermediate Economic Analysis, 6
 - B.A. 65, Analysis of Financial Statements, 3
 - Econ. 149, Business Cycles, 3
2. Special requirements
 - Ag.Ec. 135, Methods of Price Analysis, 3
 - Ag.Ec. 150, Advanced Farm Finance, 3
 - Ag.Ec. 170, Land Economics, 3
 - Ag.Ec. 191, Advanced Agricultural Statistics, 3

VI. Agricultural Journalism

This curriculum is offered jointly by the College of Agriculture, Forestry, Home Economics, and Veterinary Medicine, the School of Journalism, and the College of Science, Literature, and the Arts. It is intended for those who wish to prepare for some branch of journalism that relates to agriculture, such as staff positions on agricultural magazines, editing country newspapers or special farm pages for newspapers, or editing bulletins for state and federal departments of agriculture and for experiment stations.

The student takes general courses in technical agriculture, but the emphasis is upon preparation for technical journalism. Stress is laid also upon economic and business courses related to agriculture.

Students majoring in agricultural journalism should register in the School of Journalism and have their programs of agricultural subjects approved in the office of the dean of this college.

The curriculum requires 180 credits for graduation and leads to the degree of bachelor of arts. Courses required in the curriculum are listed below.

Students must also meet the all-college requirements for graduation. (See page 13.)

FRESHMAN YEAR

- Comp. 4-5-6, Freshman Composition, 9
- Nat.Sci. 1-2-3, Orientation in the Natural Sciences, 15
- Electives, social sciences, 9-15, and natural sciences, 10

SOPHOMORE YEAR

- Ag.Ec. 1-2, Principles of Economics I and II, 8
- Comp. 27-28, Advanced Writing, 6
- Jour. 13, Introduction to Reporting, 3
- Jour. 14-15, Newspaper Reporting, 6
- Soc. 1, Introduction to Sociology, 5
- Soc. 14, Rural Sociology, 3
- Electives, 11-18

JUNIOR YEAR

Ag.Ec. 8, Rural Economics, 3
 Jour. 51-52, News Editing, 6
 Jour. 55, Advertising and Newspaper Typography, 3
 Jour. 69, Newspaper and Magazine Articles, 3
 Jour. 110, History of Journalism, 3
 Electives, 27

SENIOR YEAR

Jour. 93, Weekly Editorial Administration, 3
 Jour. 94, Newspaper Advertising, 3
 Jour. 112, Current Newspaper Problems, 3
 Jour. 140-141, Interpretation of Contemporary Affairs, 6
 Ag.Jo. 54, Editing Agricultural Bulletins, 3
 Electives, Jour. 3
 Electives, 24

SUGGESTED ELECTIVES

Journalism: 65, 68, 78, 95, 130-131
 Agriculture or Forestry:
 Agricultural Economics 104, 110-111, 170
 Agricultural Journalism 53
 Agronomy 1, 31
 Forestry 1, 10, 136

Horticulture 6, 10, 32, 60
 Animal Husbandry 1, 56-57
 Dairy Husbandry 1
 Poultry Husbandry 1

Other:

Social Science 1-2-3
 History 1-2-3, 20-21-22
 Humanities 1, 2, 3
 Political Science 1-2-3, 7, 25
 Psychology 1-2, 4-5, 56
 Sociology 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 be approved by the School of Journalism.

A minor in Journalism should include Jour. 11, 41, 69, and Ag.Jo. 53, and six additional credits selected from Jour. 78, 110, 111, 121, and 130, or from Ag.Jo. 54 and 55.

VII. Agricultural Engineering**PROFESSIONAL FIVE-YEAR CURRICULUM**

A professional curriculum in Agricultural Engineering is offered jointly with the Institute of Technology. It has the same requirements in basic mathematics, mechanics, and physics as all other engineering curricula. Work during the first year is entirely in the Institute of Technology, and the course requirements are the same as for all other engineering students. In subsequent years the work is in both colleges. It is a five-year curriculum leading to the degree of bachelor of agricultural engineering.

This curriculum is designed to train engineers for work in fields fundamental to agricultural practices and industries. Four specializations are provided: Rural Electrification, Farm Structures, Farm Power and Machinery, and Soil and Water Conservation.

For further information consult the Division of Agricultural Engineering, St. Paul Campus. Course and curriculum details are given in the Bulletin of the Institute of Technology.

VIII. Agricultural Engineering Business Administration**PROFESSIONAL FIVE-YEAR CURRICULUM**

This curriculum is offered jointly with the Institute of Technology and the School of Business Administration. It is a five-year engineering and business curriculum with emphasis in the field of agriculture. The course requirements in engineering and agriculture are the same as those for the professional curriculum in Agricultural Engineering. In addition, a sequence of

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

Students interested in this curriculum should see the Bulletin of the Institute of Technology or consult the Division of Agricultural Engineering, St. Paul Campus.

IX. Food Technology

Food technology embraces the application of science and engineering to the handling, processing, manufacture, storage, distribution, and utilization of foods. The various food industries require highly trained personnel to select raw materials; to control manufacturing operations; to solve technical problems related to the palatability, nutritive value, public health safety, and keeping quality of the foods; and to develop new methods and processes.

In addition to the various food industries concerned with the processing and distribution of cereals, fruits and vegetables, dairy products, meats, and other perishables, employment opportunities exist in the organic chemical industry, in state and federal control and research laboratories, in private research institutions, and in teaching.

The undergraduate curriculum is designed to provide students with an adequate foundation in the basic sciences of mathematics, physics, chemistry, biology, and in chemical engineering. Some opportunity is also provided through electives for a student to acquire additional training in chemical engineering; in microbiology, biochemistry, or other special biological fields in the technology of fruits and vegetables, meat and dairy products; or in economics and business. The electives chosen will depend on the professional goal of the student and must be selected in consultation with the special faculty advisory committee for this curriculum. Students who do not enter with credit in higher algebra will find it difficult to complete the required courses in chemical engineering in four years.

Since a thorough background is required in so many branches of pure and applied science, it is impossible for a student to acquire a sufficiently detailed and intensive training in a four-year curriculum for the more specialized positions in the various branches of food technology, and post-graduate work is strongly recommended.

Only those students who have a high school record considerably above the average, who are capable of maintaining a high scholastic record in college, and who have a keen interest in pure and applied science should attempt to follow this curriculum.

The Food Technology Curriculum requires 204 credit hours for completion.

Students must meet the all-college requirements for graduation from this college. (See page 13.)

In the freshman and sophomore years a grade of C or better must be earned in all courses except Orientation 1 and Public Health 3.

In the junior and senior years, a grade of C or better must be earned in all courses except the electives in social science; and the honor point ratio, exclusive of the courses in social science, must be 1.5 or better.

FRESHMAN-SOPHOMORE YEARS

(109 credits)

- Ag.Bi. 2, Quantitative Methods, 5
- Ag.En. 3, Mechanical Drawing, 3
- Ch.En. 80, Chemical Engineering Materials, 1
- Germ. 24-25-26, Chemical German, 12
- In.Ch. 1-2 or 4-5, General Inorganic Chemistry, 8
- In.Ch. 11, Semimicro Qualitative Analysis, 4
- Mathematics: (or M.&M. listed below)
- Math. 6, Trigonometry, 5 (See Math. req., page 10)
- Math. 7, College Algebra, 5
- Math. 30, Analytic Geometry, 5
- Math. 50-51, Calculus I and II, 10
- Mathematics and Mechanics (Inst. Tech.)
- M.&M. 11, College Algebra, 5
- M.&M. 12, Trigonometry, 5
- M.&M. 13, Analytic Geometry, 5
- M.&M. 24-25, Calculus I and II, 10
- Na.Sc. 7-8-9, General Biology, 10
- Or.Ch. 61-62-63, Elementary Organic Chemistry, 10
- Or.Ch. 64, Elementary Organic Chemistry Lab., 3
- Orie. 1, College Orientation Lectures, 1
- Phys. 7-8-9, General Physics, 15
- P.H. 3, Personal Health, 2 (See page 10)
- Rhet., Communications requirement

JUNIOR-SENIOR YEARS

(97-99 credits)

- Ag.Bi. 3, Introduction to Biochemistry, 3
- Ag.Bi. 5, Plant Biochemistry, 3
- Ag.Bi. 6, Animal Biochemistry, 3
- Bact. 53, General Bacteriology, 5
- Ch.En. 101-102-103, Unit Operations, 13
- Ch.En. 111-112, Unit Operations Lab., 2
- Ag.Ec. 1-2, Principles of Economics, 8, or Econ. 6-7, Principles of Economics, 10
- Food 51-52, Food Analysis, 4
- Food 101-102, Food Technology, 6
- Ph.Ch. 101-102-103, Physical Chemistry, 9
- Rhet. 22, Public Speaking, 3
- Rhet. 51, Exposition, 3
- Social Science electives, 8 cred.
- Electives, selected from list below, or from other courses and departments approved by Subcommittee on Food Technology, 27-29 cred.)

SUGGESTED ELECTIVE COURSES

Agricultural Biochemistry: 103, 108, 110, 116, 117, 119, 120, 121, 122, 123, 124, 129, 130, 131, 132, 133
 Agricultural Economics: 25, 40, 90, 141, 142, 143
 Agricultural Engineering: 70
 Agronomy and Plant Genetics: 21, 22, 31
 Animal Husbandry: 50, 52, 53
 Dairy Husbandry: 3, 4, 50, 110, 111, 112, 113, 114, 115
 Entomology and Economic Zoology: 5, 51, 128, 129, 177
 Food Technology: 104, 105
 Home Economics: 31, 33, 35, 40, 41, 45, 64, 142, 146, 170
 Horticulture: 138, 139
 Plant Pathology: 1, 105, 106, 107, 160, 161, 163
 Poultry Husbandry: 52, 153, 154

Other Colleges

Analytical Chemistry: 101, 102, 105, 127, 131, 132, 133, 140
 Bacteriology: 104, 113, 114, 121, 122, 123
 Chemical Engineering: 105, 117, 118, 121
 Economics: 3, 22, 28, 161
 Mechanical Engineering: 180, 189
 Organic Chemistry: 105, 106, 107, 110, 130, 142, 143
 Physical Chemistry: 104, 105, 106, 128, 129, 130, 131, 132, 133, 134
 Physics: 114, 116, 118, 131, 134, 144
 Physiology: 4, 100, 101
 Political Science: 1, 2, 3
 Psychology: 1, 2
 Public Health: 100, 102, 110, 111
 Zoology: 21, 51, 145, 146

X. Fishery and Wildlife Management

(See also Forestry-Wildlife Management Curriculum, page 37.)

This curriculum prepares students in basic biology and in related fields essential to the fishery and wildlife technician. Qualified students are advised to continue their training in the Graduate School where a wide variety of specializations, all dependent upon basic technical knowledge, is possible. Among them are fishery, bird, and mammal management in relation to other land uses on public and private lands, research in the ecological or economic phases of such management, teaching or extension programs in colleges or schools, and improvement of hunting or fishing on public or privately owned areas.

Fishery and Wildlife Management has important relations to the following government and private enterprises: U.S. Fish and Wildlife Service, State Conservation Departments, U.S. and State Forest Services, National and State Park Services, and soil conservation programs.

The curriculum requires 198 credit hours for graduation which include 8 credits at the Biological Station, Itasca State Park.

Students must meet the all-college requirements for graduation from this college. (See page 13.)

All students must complete certain basic courses. The order, listed below, may represent more than 17 credit hours per quarter in some years. In such cases courses not scheduled during the required year must be taken at the first opportunity available.

FRESHMAN YEAR

Ag.En. 3, Mechanical Drawing, 3
 Bot. 1-2, General Botany, 6
 In.Ch. 1-2 or 4-5, General Inorganic Chemistry, 8
 Math. 1, Higher Algebra, 5; Math. 6, Trigonometry, 5; Math. 7, College Algebra, 5 (See Math. req., page 10)
 Orie. 1, College Orientation Lectures, 1
 P.H. 3, Personal Health, 2 (See page 10)
 Rhet., Communications requirement
 Zool. 1-2-3, General Zoology, 10

SOPHOMORE YEAR

Ag.Bi. 2, Quantitative Methods, 5
 Ag.En. 19, Elementary Surveying, 3
 Ag.En. 24-25, Agricultural Physics, 8
 Bot. 52, Elementary Taxonomy, 3
 Math. 30, Analytical Geometry, 5
 Or.Ch. 61-62, Elementary Organic Chemistry, 8
 Soil. 4, Soils, 3

JUNIOR YEAR

1. Freshman and sophomore courses not completed
2. General courses
 - Bot. 50, General Plant Ecology, 3
 - Bot. 113, Flora of Minnesota, 3, or Bot. 115, Spring Flora of Minnesota, 3
 - Ent. 52, Introductory Entomology, 5
 - Po.Sc. 5, American Government and Politics, 5
 - Rhet. 22, Public Speaking, 3
 - Rhet. 51, Exposition, 3
 - Zool. 22, Comparative Anatomy, 5
 - Zool. 50, Introduction to General Physiology, 5
 - Zool. 83, Introduction to Genetics and Eugenics, 5

3. **Biological Station at Itasca State Park (Summer Session) is required. Two of the following courses must be taken.**

- Bot. 112, Aquatic Flowering Plants, 4
- Bot. 176, Freshwater Algae, 4
- Ent. 162, Ecology of Terrestrial Vertebrates, 4
- Zool. 119, Limnology, 4

SENIOR YEAR

1. General courses

- Ag.Ec. 1-2, Principles of Economics I and II, 8
- Biostatistics 110-111, Biometric Principles, 5
- Ent. 63, Mammalogy, 4

- Ent. 64, Introduction to Fishery and Wildlife Management, 5
- Geol. 8, Earth Features and Their Meaning, 5
- Zool. 53, Faunistic Zoology, 5
- Zool. 57, Introductory Ornithology, 3
- Zool. 58, Introductory Ornithology, 3, or Zool. 119, Animal Ecology, 3
- Zool. 121, Ichthyology, 3

2. Recommended electives

- Agricultural Engineering: 31
- Agricultural Journalism: 54
- Classics: 24
- Forestry: 1, 4, 20, 126, 131, 155
- German or Russian: 15 cred.
- Plant Pathology: 53
- Rhetoric: 54

XI. Science Specialization

This curriculum provides for intense specialization 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.

The 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 divisions and with the dean of the college.

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

Attention is called to the modern language requirement for graduate students. In most divisions one foreign language is required for the Master's degree and two foreign languages for the degree of doctor of philosophy.

Proficiency in at least one language, preferably German, should be acquired during the undergraduate years. The modern language requirement is interpreted to mean either German or French unless some other language is recommended by the student's major adviser.

The 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) major, minor, and electives in the junior and senior years in accordance with the schedule given below.

Students who have not earned an honor point ratio of 1.5 in the freshman and sophomore years should not plan to continue in Science Specialization and will be permitted to do so only upon the written recommendation of the adviser and with the approval of the faculty committee on Science Specialization.

For the all-college requirements for graduation from this college, see page 13.

FRESHMAN YEAR

A student should register for either botany or zoology in the freshman year, the other in the sophomore year. Either mathematics or a modern language should be taken in the freshman year, the other in the sophomore year.

- Bot. 1-2-3 or 4-5, General Botany, 10
- In.Ch. 1-2 or 4-5, General Inorganic Chemistry, 8
- Math. 1, Higher Algebra, 5; Math. 6, Trigonometry, 5; and Math. 7, College Algebra, 5 (See Math. req., page 10)
- Modern language, 15 cred. or special sequence of 12

Orie. 1, College Orientation Lectures, 1
 P.H. 3, Personal Health, 2 (See page 10)
 Rhet., Communications requirement
 Zool. 1-2-3, General Zoology, 10, or Zool.
 14-15, General Zoology, 6, and 3 additional
 cred. of zoology or physiology, or economic
 entomology and zoology (Ent. 5, 5 cred.
 suggested)

SOPHOMORE YEAR

Ag.Bi. 1, Elementary Organic Chemistry, 5
 Ag.Bi. 3, Introduction to Biochemistry, 3
 Ag.Bi. 5, Plant Biochemistry, 5, or Ag.Bi. 6,
 Animal Biochemistry, 3
 Ag.Ec. 1-2, Principles of Economics I and
 II, 8
 Bact. 53, General Bacteriology, 5
 Bot., if not taken in the fr. yr.
 Math., if not taken in the fr. yr.
 Mod. Lang., if not taken in the fr. yr.
 Rhet. 22, Public Speaking, 3
 Soil. 4, Soils, 3
 Zool., if not taken in the fr. yr.

JUNIOR AND SENIOR YEARS

1. Rhet. 51, Exposition, 3
2. A major sequence of 24 to 36 credits in one of the following fields:

Agricultural Biochemistry
 Agricultural Economics
 Agronomy and Plant Genetics
 Animal Husbandry
 Animal Nutrition
 Dairy Husbandry
 Entomology and Economic Zoology
 Forestry
 Home Economics
 Horticulture
 Plant Pathology
 Poultry Husbandry
 Soils

3. A minor sequence of 12 credits is chosen in some division, department, or field work outside of the major.
4. Those courses listed as specific requirements in this curriculum may not be applied toward a major or a minor.
5. 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.



SCHOOL OF FORESTRY

Forestry courses were given by the University of Minnesota as early as 1886, but professional work leading to the bachelor of science degree was not offered until 1903 when the present School of Forestry had its formal beginning. Since that time more than 1,000 foresters have been granted undergraduate and graduate degrees.

The bachelor of science degree is granted upon completion of 204 quarter credits of required and elective courses in one of the following fields of specialization: I, Forest Management, II, Forestry-Wildlife Management, III, Building Products Merchandising and Light-Construction, IV, Wood Technology, and V, Wood Technology—Furniture.

Graduate work leading to the professional degree of master of forestry (M.F.) is offered selected students holding the B.S. degree who wish to further prepare themselves for professional work in forestry. (See page 39.)

Graduate work leading to the master of science (M.S.) and doctor of philosophy (Ph.D.) degrees is offered in cooperation with the Graduate School to those qualified students desiring to prepare themselves for research in some field of forestry and forest products industries. (See page 39.)

The School of Forestry is fully accredited by the Society of American Foresters, the national accrediting agency for U.S. forestry schools.

FACILITIES

The School of Forestry possesses excellent facilities for training foresters. Located on the St. Paul Campus of the University and housed in a modern building, Green Hall, it draws on many departments on both the St. Paul and the Minneapolis Campuses for in-

struction in courses basic to the training of foresters. Also housed in Green Hall is the Lake States Forest Experiment Station of the U.S. Forest Service, and a branch office of the U.S. Fish and Wildlife Service.

For students interested in forest management and forestry-wildlife management, the Lake Vadnais Plan-

tations of over 300 acres, located within 10 miles of the campus, are available for field laboratory work during the regular school year. However, most of the field training for students specializing in these fields is concentrated at the Itasca Forestry and Biological Station and the Cloquet Experimental Forest.

The Itasca Forestry and Biological Station is located on Lake Itasca, the source of the Mississippi River, in Itasca State Park. It provides an excellent field laboratory for forest management and forestry-wildlife management majors. Here in a six-week Summer Session, from about June 15 to July 25, students have an opportunity to study forest botany, field zoology, field silvics, and forest measurements on a 30,000 acre tract of virgin- and second-growth forest, including practically all forest types found in Minnesota. Good housing, dining hall, and laboratory facilities are available. Students operate their own mess at cost.

The Cloquet Experimental Forest is located near the forest products manufacturing center of Cloquet in northeastern Minnesota and comprises a tract of over 3,700 acres of virgin- and second-growth timber. The entire spring quarter of the senior year is spent at Cloquet. Training in all phases of field forestry, nursery operations, planting, thinning, preparation of management plans, utilization, forest surveys, and aerial photographic interpretation is included. Housing, dining hall facilities, and laboratories are available.

Available in Green Hall for training students interested in employment in the forest-products industries and for building-products merchandising are several well-equipped laboratories: woodworking, wood chemistry, timber testing, and wood preservation. Local furniture plants and building-products merchandising concerns provide added opportunity for training students in the several wood utilization fields.

THE WORK OF FORESTERS

The work of foresters is diverse. Forest management and forestry-wildlife management graduates are concerned primarily with the scientific management and protection of the forest, wildlife, recreation, grazing, and water resources on the approximately one third of the land area of the United States which is classified as

forest land. The majority of these graduates work largely with the management of forest lands for production of timber crops. Until recently public forest land managing agencies—federal, state, county, and municipal—employed most of the graduates in these fields. Within the past ten years, however, there has been increasing employment of Forestry School graduates by private owners of forest lands—lumber, pulp and paper, plywood, and other wood-processing companies.

Graduates training in the several utilization fields—building products and merchandising, wood technology, and wood technology-furniture—find employment in the development, production, and merchandising of forest products.

Prospective students interested in obtaining further information on the various fields of forestry employment, employment opportunities, salaries of graduate foresters, etc., are urged to obtain copies of Handbook of Information on Entering Positions in Forestry which may be obtained from the Society of American Foresters, 825 Mills Building, 17th Street and Pennsylvania Ave. N.W., Washington 6, D.C. (cost 25 cents) and Careers in Forestry, U.S. Dept. of Agr. Misc. Pub. No. 249 which may be obtained from the Government Printing Office, Washington, D.C. (free).

GENERAL INFORMATION

The first two years of work in all forestry curricula are devoted primarily to basic courses such as chemistry, botany, mathematics, rhetoric, geology, economics, sociology, government, and surveying. In addition to these basic courses common to most curricula, usually one 3-credit professional forestry course per quarter is included. Because the first two years of basic work is somewhat similar in all curricula, students may transfer between curricula at the completion of their sophomore year with little loss of credit.

The six-week Summer Session at the Itasca Forestry and Biological Station is required of all Forest Management and Forestry-Wildlife Management majors, including transfer students. This requirement must be completed prior to the junior year unless special permission for postponement is given.

The spring quarter of the senior year of Forest Management and For-

estry-Wildlife Management is spent at the Cloquet Experimental Forest and is required of all majors in these fields.

The growing complexity of the duties performed by foresters in the management of natural resources affecting practically every phase of our society, demands that they have knowledge and training in economics, sociology, government, and other fields of social science. This need is the basis of the college requirement for 18 credits in social sciences.

Students registered in preforestry curricula at junior colleges, teachers' colleges, and other schools should complete the basic course requirements included in the School of Forestry Curricula if they are to receive full credit on transfer for work completed. In addition, students registered in preforestry curricula at other institutions should plan to transfer at least by the end of their second year if they expect to complete the professional course requirements of the School of Forestry in two years.

Preforestry students at other institutions may complete the six-week Summer Session requirement at the Itasca Forestry and Biological Station at the end of their freshman year and return to their school for sophomore work if they choose. However, completion of this Summer Session requirement should not be delayed beyond the sophomore year.

Students are encouraged to obtain practical experience in forestry or the forest products industries during the summer vacation period. Although work experience is not required for graduation, students find that the possession of such experience is an excellent recommendation when seeking employment. The School of Forestry assists students in obtaining summer employment with such federal agencies as the U.S. Forest Service, various state agencies, and with private companies.

With one exception, the all-college entrance requirements apply to high school graduates planning to register for forestry. For entrance to the School of Forestry, students must have had at least two units of mathematics, including elementary algebra and plane geometry.

FORESTRY CURRICULA

Work leading to the bachelor of science degree on the completion of four years of satisfactory work is offered in the following specializations:

I. Forest Management—Preparation for technical work in forest management on public and private forest lands; for work in state and federal forest experiment stations; for work with soil conservation, extension, and farm forestry organizations, and for timber procurement and logging.

FEES FOR FIELD TRAINING SESSIONS

(Not listed in the *Bulletin of General Information* of the University)

The following fees and expenses are paid during the field training sessions at Cloquet and Itasca.

Cloquet Session (Seniors in Forestry Curricula—spring quarter)

Tuition: Residents of Minnesota	\$ 33.00
Nonresidents	100.00
Health fee	3.25

In addition, \$10 is charged each student for the use of the dormitory and dining hall and will be collected by the student treasurer and paid to the professor in charge of the Cloquet Experimental Forest during the first week of the spring quarter.

Lake Itasca Forestry and Biological Station (Freshmen in Forestry Curricula—Summer Session)

Tuition (prorated on basis of regular quarter tuition per quarter of 12 weeks)	
Residents of Minnesota	\$ 16.50
Nonresidents	50.00
Health fee	3.25

A fee of \$5 is charged each student for the use of the dormitory and dining hall and will be collected by the student treasurer and paid to the director of the Itasca Forestry and Biological Station during the first week of the session.

In addition, a deposit of \$2 is charged new students.

II. Forestry-Wildlife Management—

Preparation for work in the same fields as covered by forest management but with added emphasis on wildlife, and intended for those forest management students with a special interest in forest wildlife. Students interested primarily in fishery and wildlife management should register in the Fishery and Wildlife Management Curriculum given under Agriculture.

III. Building Products Merchandising and Light - Construction—Preparation for work in lumber-yard management, building-products merchandising, and light-construction.

IV. Wood Technology — Preparation for technical work in the fields of pulp and paper, wood preservation, plywood manufacture, wood seasoning, and other wood processing industries.

V. Wood Technology — Furniture — Preparation for work in the manufacture and merchandising of furniture.

Although no organized curriculum is offered in range management, students with a special interest in this

field may obtain the equivalent of major work by selection of added botany, soils, agronomy, and animal husbandry courses under the elective group of either the Forest Management or Forestry-Wildlife Management Curricula.

VI. Graduate Study in Forestry.**CURRICULA REQUIREMENTS**

During the first two years, the work in all forestry curricula is similar and is devoted largely to a study of general courses. Required course work for the four years has been held to approximately 160 credits in most curricula. In addition to completion of the required courses, students must complete sufficient elective courses to make a total of at least 204 credits.

Credit earned in military science can be applied towards graduation in the elective group.

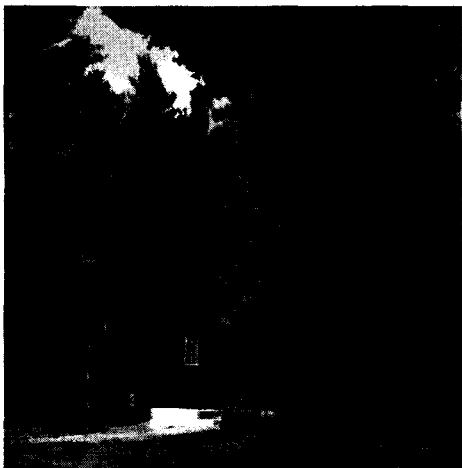
The attention of all students is called to the Social Science requirement, page 11.

I. Forest Management**FRESHMAN YEAR**

Ag.En. 3, Mechanical Drawing, 3
 Bot. 1-2, General Botany, 6
 In.Ch. 1-2 or 4-5, General Inorganic Chemistry, 8
 Math. 6, Trigonometry, 5 (See Math. req., page 10)
 Rhet., Communications req., 9
 Ori. 1, College Orientation Lectures, 1

For. 1A, Conservation of Natural Resources, 3
 For. 1, Introduction to Forestry, 3
 For. 4, Dendrology, 4
 Total required credits, 42

*Itasca Forestry and Biological Station
 Summer Session for Foresters (6 weeks)*
 Required of all Forest Management and Forestry-Wildlife Management students
 For. 2, Important Forest Plants, 1½



(Left) Cabin for Students at Itasca Forestry and Biological Station, and
 (Right) Virginia Red Pine at Cloquet Experimental Forest

For. 5, Field Forest Ecology, 2
 For. 6, Field Measurements, 2
 Ent. 13, Field Zoology, 1½
 Total credits, 7

SOPHOMORE YEAR

Ag.Bi. 1, Elementary Organic Chemistry, 5
 Ag.Ec. 1-2, Principles of Economics I and II, 8
 Ag.En. 19, Elementary Surveying, 3
 Ag.En. 50, Advanced Surveying, 3
 Geol. 1, General Geology, 3. (Students are encouraged to take Geol. A, Geology Laboratory, 2, as an elective. Geol. 3, Earth Features and Their Meaning, 5, may be taken in place of 1 and A.)
 P.H. 3, Personal Health, 2 (See page 10)
 Rhet. 22, Public Speaking, 3
 Pl.Pa. 10, Forest Pathology, 5
 Soil. 4, Introduction to Soils, 3
 For. 7-8, Forest Measurements, 6
 For. 9, Introduction to Forest Surveys and Aerial Photography, 3
 Total required credits, 44

JUNIOR YEAR

Ag.En. 24-25, Agricultural Physics, 8
 Zool. 14-15, General Zoology, 6
 For. 51, Logging, 3
 For. 53-54, Wood Structure and Identification, 6
 For. 55, Forest Protection, 3
 For. 56, Forest Products, 3
 For. 126, Forest Ecology, 3
 For. 127, Introduction to Silviculture, 3
 Total required credits, 35

II. Forestry-Wildlife Management

FRESHMAN YEAR

Same as freshman year in Forest Management
 Total required credits, 42
 Itasca Summer Session required credits, 7

SOPHOMORE YEAR

With the exception of the following, the requirements are the same as those in Forest Management
 Zool. 14-15 should be taken in the sophomore year
 For. 7-8-9 should be taken in the junior year
 Total required credits, 41

JUNIOR YEAR

Ag.En. 24-25, Agricultural Physics, 8
 For. 7-8, Forest Measurements, 6
 For. 9, Introduction to Forest Surveys and Aerial Photography, 3
 For. 53, Wood Structure, 3
 For. 55, Forest Protection, 3
 For. 56, Forest Products, 3
 For. 126, Forest Ecology, 3
 For. 127, Introduction to Silviculture, 3

SENIOR YEAR

Ent. 64, Introduction to Fishery and Wildlife Management, 5
 Ent. 56, Forest Entomology, 5
 Rhet. 51, Exposition, 3
 For. 123, Introduction to Forest Economics and Valuation, 3
 For. 124, Introduction to Forest Management, 3

Cloquet Experimental Forest

(Requirements: An accumulative honor point ratio of at least 1.0 at the end of the fall quarter of the senior year, which must be maintained through the winter quarter; also completion of the majority of required courses 100 or over.)
 Ent. 167, Technical Wildlife Management, 3
 For. 128-129, Field Silviculture I-II, 6
 For. 133, Forest Management and Utilization, 4
 For. 134, Forest Inventory and Aerial Photographic Interpretation, 4
 Total required credits, 36

SUGGESTED ELECTIVES

Military Science and Tactics
 Social Science courses
 Forestry: 20, 137, 143
 Agricultural Economics: 25
 Plant Pathology: 53
 Economics: 28
 Botany: 50, 51, 113, 115
 Soils: 103
 Agricultural Engineering: 104

Zool. 22, Comparative Anatomy, 5
 Total required credits, 37

SENIOR YEAR

Ent. 56, Forest Entomology, 5
 Ent. 63, Mammalogy, 4
 Ent. 64, Introduction to Fishery and Wildlife Management, 5
 Rhet. 51, Exposition, 3
 For. 123, Introduction to Forest Economics and Valuation, 3
 For. 124, Introduction to Forest Management, 3
 Spring session at Cloquet Experimental Forest. (See courses listed under Forest Management Curriculum.)
 Total required credits, 40

SUGGESTED ELECTIVES

Military Science and Tactics
 Social science courses
 Forestry: 20, 51, 54, 137, 143
 Agricultural Economics: 25
 Plant Pathology: 53
 Economics: 28
 Botany: 50, 51, 113, 115
 Soils: 103
 Agricultural Engineering: 104

III. Building Products Merchandising and Light-Construction

This curriculum is suggested for those who wish to enter the lumber and other building-products merchandising and construction fields. It includes fundamental courses in business, economics, light-building construction, and training in the structure, properties, and uses of wood.

FRESHMAN YEAR

Ag.En. 3, Mechanical Drawing, 3. (Students are encouraged to take Eng. Drawing 1-2 as a substitute for this course.)
 Bot. 1-2, General Botany, 6
 In.Ch. 1-2 or 4-5, General Inorganic Chemistry, 8
 Math. 6, Trigonometry, 5, and Math. 7, College Algebra, 5. (See Math. req., page 10)
 Math. 8, Commerce Algebra, 5, may be taken as a substitute for Math. 7
 Ori. 1, College Orientation Lectures, 1
 Rhet., Communications req., 9
 For. 1A, Conservation of Natural Resources, 3
 For. 1, Introduction to Forestry, 3
 For. 4, Dendrology, 4
 Total required credits, 47

SOPHOMORE YEAR

Ag.Bi. 1, Elementary Organic Chemistry, 5
 Ag.En. 24-25, Agricultural Physics, 8
 Ag.Ec. 1-2, Principles of Economics I and II, 8

IV. Wood Technology

This curriculum is suggested for those who wish to enter the field of pulp and paper manufacture, wood preservation, plywood, wood fiber products, or other industries using wood as a raw material.

FRESHMAN YEAR

Bot. 1-2, General Botany, 6
 In.Ch. 1-2 or 4-5, General Inorganic Chemistry, 8
 In.Ch. 11, Semimicro Qualitative Analysis, 4
 Math. 6, Trigonometry, 5, and Math. 7, College Algebra, 5. (See Math. req., page 10)
 Ori. 1, College Orientation Lectures, 1
 Rhet., Communications req., 9
 For. 1A, Conservation of Natural Resources, 3
 For. 1, Introduction to Forestry, 3
 For. 4, Dendrology, 4
 Total required credits, 48

SOPHOMORE YEAR

Ag.Bi. 2, Quantitative Methods, 5
 Ag.Ec. 90, Agricultural Statistics, 5

Econ. 28, Business Law, 3
 Rhet. 22, Public Speaking, 3
 P.H. 3, Personal Health, 2 (See page 10)
 Soc. 1, Introduction to Sociology, 3
 Zool. 14-15, General Zoology, 6
 For. 7, Forest Measurements, 3
 Total required credits, 41

JUNIOR YEAR

Arch. 57-58, Building Materials and Methods, 8
 B.A. 54-55, Elementary Accounting, 8
 B.A. 77, Survey in Marketing, 3
 B.A. 89, Production Management, 3
 Econ. 3, Elements of Money and Banking, 5
 Econ. 5, Elements of Statistics, 5
 For. 53-54, Wood Structure and Identification, 6
 For. 121, Wood Finishing, 3
 Total required credits, 41

SENIOR YEAR

B.A. 113, Sales Management, 3
 Rhet. 51, Exposition, 3
 For. 52, Wood Seasoning, 3
 For. 56, Forest Products, 3
 For. 57, Wood Utilization, 3
 For. 58, Lumber Merchandising, 3
 For. 114-115, Mechanical and Physical Properties of Wood, 6
 For. 116, Fabrication and Properties of Wood Assemblies, 3
 For. 120, Building-Cost Estimating, 3
 For. 125, Wood Preservation, 3
 Total required credits, 33

Ag.En. 3, Mechanical Drawing, 3
 Math. 39, Analytical Geometry, 5
 Math. 50-51, Calculus I and II, 10
 Pl.Pa. 10, Forest Pathology, 5
 Rhet. 22, Public Speaking, 3
 Soc. 1, Introduction to Sociology, 3
 Total required credits, 39

JUNIOR YEAR

Ag.Ec. 1-2, Principles of Economics I and II, 8
 Or.Ch. 61-62, Elementary Organic Chemistry, 8
 Ag.En. 24-25, Agricultural Physics, 8
 Po.Sc. 25, World Politics, 3
 P.H. 3, Personal Health, 2 (See page 10)
 For. 53-54, Wood Structure and Identification, 6
 Total required credits, 35

SENIOR YEAR

Ag.Bi. 119, Colloids, 3
 Ag.Bi. 121, Carbohydrates, 3
 Bact. 53, General Bacteriology, 5
 Rhet. 51, Exposition, 3
 For. 52, Wood Seasoning, 3
 For. 56, Forest Products, 3

For. 57, Wood Utilization, 3
 For. 113, Wood Pulp and Paper, 3
 For. 114-115, Mechanical and Physical Properties of Wood, 6
 For. 116, Fabrication and Properties of Wood Assemblies, 3

For. 119, Advanced Wood Structure, 4
 For. 125, Wood Preservation, 3
 For. 142, Wood Chemistry, 3
 Total required credits, 45

V. Wood Technology—Furniture

Suggested for those wishing to enter technical or administrative work in wood-using industries, with special emphasis on the manufacture and marketing of furniture. Includes fundamental courses in business, production management, structure, properties, uses, and finishing of wood and wood products.

FRESHMAN YEAR

Bot. 1-2, General Botany, 6
 In.Ch. 1-2 or 4-5, General Inorganic Chemistry, 8
 Math. 6, Trigonometry, 5, and Math. 7, College Algebra, 5, or Math. 8, Commerce Algebra, 5. (See Math. req., page 10)
 Orie. 1, Freshman Orientation Lectures, 1
 Rhet., Communications requirement, 9
 For. 1A, Conservation of Natural Resources, 3
 For. 1, Introduction to Forestry, 3
 For. 4, Dendrology, 4
 Total required credits, 44

SOPHOMORE YEAR

Ag.Ec. 1-2, Principles of Economics I and II, 8
 Ag.En. 24-25, Agricultural Physics, 3
 Draw. 1-2, Engineering Drawing, 6
 Draw. 3, Descriptive Geometry, 3
 B.A. 54-55, Principles of Accounting, 3
 Econ. 28, Business Law, 3
 Me.En. 4, Machine Woodworking, 2
 P.H. 3, Personal Health, 2 (See page 10)

Rhet. 22, Public Speaking, 3
 Soc. 1, Introduction to Sociology, 3
 Total required credits, 46

JUNIOR YEAR

B.A. 66, Cost Accounting Survey, 3
 B.A. 89, Production Management, 3, or
 In.En. 150, Elements of Industrial Engineering and Management, 3
 Ag.Bi. 1, Elementary Organic Chemistry, 5
 For. 53-54, Wood Structure and Identification, 6
 For. 56, Forest Products, 3
 For. 57, Wood Utilization, 3
 For. 119, Advanced Wood Structure, 4
 For. 142, Wood Chemistry, 3
 Rhet. 51, Exposition, 3
 Total required credits, 33

SENIOR YEAR

In.En. 153, Method Analysis and Work, 3
 In.En. 165, Industrial Plants, 3
 In.En. 180, Elements of Supervision, 3
 In.En. 181, Industrial Relations, 3, or Econ. 161, Manpower Economics, 3
 For. 52, Wood Seasoning, 3
 For. 58, Lumber Merchandising and Grading, 3
 For. 114-115, Mechanical and Physical Properties of Wood, 6
 For. 121, Wood Finishing, 3
 For. 125, Wood Preservation, 3
 Me.En. 60, Woodworking Machinery, 3
 Me.En. 118, Glues, Plywood, and Laminated Assemblies, 3
 Total required credits, 36

VI. Graduate Study in Forestry

Graduate study leading to the master of science (M.S.), doctor of philosophy (Ph.D.), and the professional degree, master of forestry (M.F.), is offered through the Graduate School in cooperation with the School of Forestry.

MASTER OF SCIENCE AND PH.D. PROGRAMS

Graduate study leading to these degrees is intended for qualified students interested primarily in training for research and teaching in the several recognized forestry specializations: silviculture, management, measurements, and wood technology. Forestry graduates

interested in these programs should consult the Bulletin of the Graduate School for details, and requests for information and admission should be directed to the Graduate School, University of Minnesota, Minneapolis 14, Minnesota.

Master of science work in forestry is limited to Plan A of the Graduate School.

MASTER OF FORESTRY PROGRAM

The master of forestry program is designed to meet the need for added professional study by qualified forestry school graduates primarily interested

in administrative and technical work in forest management.

Students registered for master of forestry work will fulfill the requirements listed under the master of science (Plan B) program of the Graduate School. Reading knowledge of a foreign language is not required for the master of forestry degree.

Graduates of forestry schools interested in the master of forestry program should consult the Bulletin of the Graduate School (master of science—Plan B) for details of requirements and should make application for admission with the Graduate School, University of Minnesota, Minneapolis 14, Minnesota.



SCHOOL OF HOME ECONOMICS

The School of Home Economics provides opportunities for the student to prepare for homemaking and a variety of professions such as teaching, dietetics, research, business, and extension work.

The bachelor of science degree is granted upon the satisfactory completion of 185 credits of required and elective course work in a chosen curriculum. The average student completes work for this degree in four years. Upon the completion of a fifth year students in home economics education may obtain a master of education degree.

Opportunities are provided for advanced study in cooperation with the Graduate School leading to the Master's and Doctor's degrees.

FOUR-YEAR CURRICULA

I. General Home Economics—Home economics courses, and courses that contribute to general education designed for those who are chiefly interested in preparation for homemaking. This curriculum does not prepare for any other specific profession. (See page 43.)

II. Dietetics—For students who wish to become dietitians in hospitals or nutritionists in institutions or community agencies. (See page 43.)

III. Home Economics Education—Offered jointly with the College of

Education for those who wish to obtain a state teacher's certificate to teach home economics in high schools. (See page 44.)

IV. Home Economics in Business—For students who wish to work in business establishments dealing with foods, clothing, textiles, and art materials. (See page 47.)

V. Institution Management—For students who are interested in preparing for the management of food enterprises such as restaurants, cafeterias, dormitories, school lunchrooms, and tea-rooms. (See page 49.)

VI. Home Economics and Nursery School Education—Offered jointly with the Institute of Child Welfare for selected individuals. Opportunities for placement are limited for those with only the Bachelor's degree. (See page 51.)

VII. Home Economics Extension—Offered jointly with the College of Education for students interested in preparation for positions in the Agricultural Extension Service, such as home agent, 4-H Club agent, or home economics specialist. A six-week period is spent in supervised field work in the Extension Service. (See page 51.)

VIII. Preparation for Research in (a) Experimental Foods, (b) Nutrition, and (c) Textiles and Clothing. For students who plan a scientific research career in home economics. This curriculum prepares for graduate work as a basis for more intense specialization in fields of home economics research. Graduate work to at least the Master's degree is assumed. Students should have a high school record or a college freshman record considerably above the average to enter this curriculum. (See page 52.)

IX. Journalism - Home Economics (major) — This is a joint curriculum with the School of Journalism for students who wish to enter fields of journalism requiring a knowledge of home economics. (See requirements for Journalism in the Bulletin of the College of Science, Literature, and the Arts.)

FIVE-YEAR CURRICULUM

I. Home Economics Education—A joint curriculum between the College of Education and the College of Agriculture, Forestry, Home Economics, and Veterinary Medicine leading to the degree of master of education. This 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 Bulletin of the the College of Education.

GENERAL INFORMATION

Each student entering the School of Home Economics works with a faculty adviser who explains the requirements of the curriculum in which the student is interested and the opportunities pro-

vided by the University for counseling, orientation, and general education. The student plans her program with the help of the adviser.

Before the junior year the student must decide upon the field in which she wishes to specialize and must file a specialization card in the Office of Admissions and Records. This card must be approved and signed by the student's adviser and the head of the section in which the student expects to major.

Specialization in any of the fields of home economics involves two types of preparation for each student: (a) a core of courses to prepare for homemaking, and (b) the courses required to prepare for a chosen profession.

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

All students are also required to meet the all-college requirement of 18 credits in social science.

New opportunities for persons with home economics training are opening up, so that careful attention should be given to the choice of electives. Home economists are needed with more training in economics, accounting, statistics, psychology, and sociology than are included in the curricula listed. Those interested in such courses should consult their advisers to find the fields where such training is wanted. Electives of general interest, or those which seem particularly suitable for the major sequence, should be chosen to complete the student's program.

The School of Home Economics will give assistance to graduates in placement in hospital internships, teaching positions, and other positions whenever possible.

The prospective transfer student should study the course requirements as given for the curriculum in which she is especially interested and should plan her courses in the Junior College insofar as possible so as to be equivalent to those in the freshman and sophomore years at the University.

Transfer credit will be applied on required work for English, physical, biological and social sciences, psychology, and certain home economics courses. Credits for courses in other areas and for work beyond the requirements in the areas will be given elective credit.

I. General Home Economics

This curriculum is designed for those who expect to enter homemaking promptly. It provides for more free electives than any other curriculum since it is not planned to meet payroll requirements.

The following courses, with the options indicated, are required of all students in the curriculum. Students must also meet the all-college requirements for graduation. (See page 13.)

FRESHMAN YEAR

- Orie. 1, College Orientation Lectures, 1
 H.E. 1, Choice and Care of Clothing, 4 (not open to H.E. srs.)
 H.E. 3, Clothing Construction A, 3
 H.E. 17, Personal and Family Living, 3 (not open to H.E. srs.)
 H.E. 20, Introduction to Related Art, 4 (not open to H.E. srs.)
 H.E. 31, Introduction to Nutrition, 3 (not open to H.E. srs.)
 H.E. 40, Food Preparation, 5
 Rhet., Communications req., 9
 Soc. 1, Introduction to Sociology, 3
 P.E., Physical Education, 3 (May be completed any time during 4 yrs.)
 Psy. A, Elementary Psychology, 5, or Psy. 1-2. (See soph. list)
 One of the following: Hum. 21, American Life I, 3; Hum. 22, American Life II, 3; Hum. 23, American Life III, 3; Pol.Sci. 25, World Politics, 3; Pol.Sci. 1-2, American Government and Politics, 6

Take Group I or II

Group I

- G.C. 10A-B, Human Biology, 6
 Dy.Hu. 20, Household Microbiology, 4, or Bact. 53 (See soph. list)

Group II

- Zool. 14-15, General Zoology, 6
 Physiol. 4, Human Physiology, 4
 Dy.Hu. 20, Household Microbiology, 4, or Bact. 53 (See soph. list)

Take Group I or II

Group I

- G.C. 7C, Elements of Chemistry, 5
 G.C. 7A, Elements of Physics, 5, or Ag.En. 35, Household Physics, 5 (Students with one year of high school physics may be exempt from this requirement)

Group II

- One of the following: Chem. 1-2, 4-5, 6-7, 9-10, General Inorganic Chemistry, 8 or 10 cred.

- G.C. 7A, Elements of Physics, 5, or Ag.En. 35, Household Physics, 5 (Students with one year of high school physics may be exempt from this requirement)

SOPHOMORE YEAR

- H.E. 4, Clothing Construction B, 3
 H.E. 24, Problems in Home Planning and Furnishing, 5; or the following sequence: H.E. 21-22, Color and Design I and II, 6, H.E. 27, Related Art Problems, 3, and H.E. 180. (See jr.-sr. list)
 H.E. 34, Nutrition Problems, 4, or H.E. 76 (See jr.-sr. list) or H.E. 170-171 (See jr.-sr. list)
 H.E. 41, Food Management and Marketing, 5
 H.E. 49, Household Equipment, 3
 Rhet. 22, Public Speaking, 3
 One of the following: Rhet. 31, English Literature I, 5; Rhet. 32, English Literature II, 3; Rhet. 33, American Life in American Literature, 3; Rhet. 60. (See jr.-sr. list)
 Bact. 53, General Bacteriology, 5, or Dy.Hu. 20 (See fr. list)
 Ag.Bi. 1, Introduction to Organic Chemistry, 5
 Ag.Ec. 3, Principles of Economics, 5
 One of the following: Soc. 2, Intermediate Sociology, 5; Soc. 14, Rural Sociology, 3; Soc. 49, Social Problems, 3; Soc. 120, 140, 141, 161 (See jr.-sr. list)
 Psy. 1-2, General Psychology, 6, or Psy. A (See fr. list)

JUNIOR AND SENIOR YEARS

- P.H. 52a-b, Health Care of the Family, 3
 H.E. 50, Textiles, 3
 H.E. 76, Nutrition, 4; or H.E. 170, Nutrition of the Family, 3, and H.E. 171, Child Nutrition, 3; or H.E. 34 (See soph. list)
 H.E. 85, Home Management Principles, 3
 H.E. 86, Home Management Laboratory, 4
 H.E. 120, Art History, 3; or the following sequence: H.E. 21-22, 27, 180.
 H.E. 180, Home Planning and Furnishing, 5; or H.E. 24 (See soph. list) and H.E. 120 (See jr.-sr. list)
 Rhet. 51, Exposition, 3
 Rhet. 60, Contemporary Literature, 3, or Rhet. 31, 32, 33 (See soph. list)
 One of the following: Soc. 141, The Family, 3; Soc. 2, 14, 49 (See soph. list); Soc. 120, Social Psychology, 3; Soc. 140, Social Organization, 3; Soc. 161, Rural Community Analysis, 3
 H.E.Ed. 90, Child Training, 3
 Additional social science to total 18 cred. (See page 11)

II. Dietetics

This curriculum is planned for those particularly interested in becoming hospital dietitians. Following graduation the student should plan to com-

plete a dietetic internship in a hospital after which she can expect employment in a hospital as administrative or therapeutic dietitian. Other employment pos-

sible is nutritionist in a public health agency or dietitian in a food clinic.

The courses listed below are required in the curriculum. A grade of at least a C is required in the following courses: Ag.Bi. 1; H.E. 40, 41, 45, 46, 65, 170, 171; Physiol. 4. Also, a C average is required for the following group of courses: H.E. 33, 35, 79, 173, 178.

Students must meet the all-college requirements for graduation. (See page 13.)

FRESHMAN YEAR

Orie. 1, College Orientation Lectures, 1
 H.E. 1, Choice and Care of Clothing, 4 (not open to H.E. srs.)
 H.E. 17, Personal and Family Living, 3 (not open to H.E. srs.)
 H.E. 20, Introduction to Related Art, 4 (not open to H.E. srs.)
 H.E. 31, Introduction to Nutrition, 3 (not open to H.E. srs.)
 H.E. 40, Food Preparation, 5
 Rhet., Communications requirement, 9
 Zool. 14-15, General Zoology, 6
 Chem. 1-2, 4-5, 6-7, or 9-10, General Inorganic Chemistry, 8 or 10 cred.
 Physiol. 4, Human Physiology, 4
 Ag.En. 35, Household Physics, 5 (Students with one year of high school physics may be exempt from this requirement)
 Soc. 1, Introduction to Sociology, 3
 P.E., Physical Education, 3 (may be completed any time during 4 yrs.)
 Psy. A, Elementary Psychology, 5, or Psy. 1-2 (See soph. list)

SOPHOMORE YEAR

H.E. 24, Problems in Home Planning and Furnishing, 5
 H.E. 33, Nutrition I, 4

H.E. 35, Nutrition II, 4
 H.E. 41, Food Management and Marketing, 5
 H.E. 45, Quantity Cookery, 6
 H.E. 46, Cafeteria Experience, 3
 H.E. 49, Household Equipment, 3
 Rhet. 22, Public Speaking, 3

One of the following: Rhet. 31, English Literature I, 5; Rhet. 32, English Literature II, 3; Rhet. 33, American Life in American Literature, 3; Rhet. 60 (See jr. list)

Bact. 53, General Bacteriology, 5
 Ag.Bi. 1, Introduction to Organic Chemistry, 5
 Ag.Bi. 2, Quantitative Methods, 5
 Ag.Ec. 3, Principles of Economics, 5
 Ag.Ec. 25, Principles of Accounting, 4, or Econ. 24-25, Principles of Accounting, 6
 Psy. 1-2, General Psychology, 6, or Psy. A (See fr. list)

JUNIOR AND SENIOR YEARS

P.H. 52a-b, Health Care of the Family, 3
 H.E. 50, Textiles, 3
 H.E. 64, Institution Buying, 4
 H.E. 65, Institution Management Problems, 3
 H.E. 79, Selected Problems for Dietitians, 3
 H.E. 85, Home Management Principles, 3
 H.E. 86, Home Management Laboratory, 4
 H.E. 142, Experimental Cookery, 3
 H.E. 170, Nutrition of the Family, 3
 H.E. 171, Child Nutrition, 3
 H.E. 173, Nutrition in Disease, 4
 H.E. 176, Advanced Nutrition, 4, or H.E. 177, Digestion and Metabolism, 3
 H.E. 178, Clinical Problems in Nutrition, 2
 H.E. 179, Readings in Nutrition, 2
 Rhet. 51, Exposition, 3
 Rhet. 60, Contemporary Literature, 3, or Rhet. 31, 32, 33 (See soph. list)
 H.E.Ed. 90, Child Training, 3
 Additional social science to total 18 credits (See page 11)

III. Home Economics Education

This college and the College of Education cooperate 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 has 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, she 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. (See curriculum)
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 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 the public schools are often expected to teach another subject in addition to home economics.

GENERAL HOME ECONOMICS TEACHING

Courses required in the curriculum are listed below. A grade of at least C is required for the following courses: 3, 4, 21, 22, 27, 34 (or 170), 40, 41.

Students must meet the all-college requirements for graduation from this college. (See page 13.)

FRESHMAN YEAR

Orie. 1, College Orientation Lectures, 1
H.E. 1, Choice and Care of Clothing, 4 (not open to H.E. srs.)
H.E. 3, Clothing Construction A, 3
H.E. 17, Personal and Family Living, 3 (not open to H.E. srs.)
H.E. 20, Introduction to Related Art, 4 (not open to H.E. srs.)
H.E. 21-22, Color and Design I and II, 6
H.E. 31, Introduction to Nutrition, 3 (not open to H.E. srs.)
H.E. 40, Food Preparation, 5
Rhet., Communications requirement, 9
Soc. 1, Introduction to Sociology, 3
P.E., Physical Education, 3 (may be completed any time during 4 yrs.)

Take Group I or II

Group I

Zool. 14-15, General Zoology, 6
Physiol. 4, Human Physiology, 4
Dy.Hu. 20, Household Microbiology, 4, or
Bact. 53 (See soph. list)

Group II

G.C. 10A-B, Human Biology, 6
Dy.Hu. 20, Household Microbiology, 4, or
Bact. 53 (See soph. list)



Home Management Class

Take Group I or II**Group I**

- One of the following: Chem. 1-2, 4-5, 6-7, 9-10, General Inorganic Chemistry, 8 or 10 cred.
G.C. 7A, Elements of Physics, 5, or Ag.En. 35, Household Physics, 5

Group II

- G.C. 7C, Elements of Chemistry, 5
G.C. 7A, Elements of Physics, 5, or Ag.En. 35, Household Physics, 5

SOPHOMORE YEAR

- H.E. 4, Clothing Construction B, 3
H.E. 27, Related Art Problems, 3
H.E. 34, Nutrition Problems, 4; or H.E. 76 (See jr.-sr. list. Not open to students having cred. for H.E. 34); or 170-171 (See jr.-sr. list)
H.E. 41, Food Management and Marketing, 5
H.E. 49, Household Equipment, 3
Rhet. 22, Public Speaking, 3
One of the following: Rhet. 31, English Literature I, 5; Rhet. 32, English Literature II, 3; Rhet. 33, American Life in American Literature, 3; Rhet. 60 (See jr.-sr. list)
Bact. 53, General Bacteriology, 5, or Dy.Hu. 20, Household Microbiology, 4
Ag.Bi. 1, Introduction to Organic Chemistry, 5
Ag.Ec. 3, Principles of Economics, 5, or Econ. 6-7, Principles of Economics, 10
Psy. 1-2, General Psychology, 6

JUNIOR AND SENIOR YEARS

- P.H. 52a-b, Health Care of the Family, 3
H.E. 50, Textiles, 3
H.E. 53, Advanced Clothing, 3
H.E. 76, Nutrition, 4
H.E. 85, Home Management Principles, 3
H.E. 86, Home Management Laboratory, 4
H.E. 170, Nutrition of the Family, 3, and 171, Child Nutrition, 3, or H.E. 34 (See soph. list), or H.E. 76
H.E. 180, Home Planning and Furnishing, 5
P.H. 59, Health of the School Child, 3
Rhet. 51, Exposition, 3
Rhet. 60, Contemporary Literature, 3, or Rhet. 31, 32, 33 (See soph. list)
Ed. 55A-B, Introduction to Secondary School Teaching, 10
Ag.Ec. 126, Economics of Consumption, 3
H.Ed. 180, The School and the Social Order, 3
H.E.Ed. 90, Child Training, 3
H.E.Ed. 91, Observation, Materials, Teaching in Home Economics, 5. (Plans for home experience prerequisite for H.E.Ed. 91 and 93 should be made early in the junior year with an adviser in home economics education. Take this course parallel with H.E.Ed. 93)
H.E.Ed. 92, Teaching Problems in Home Economics, 2 (Take parallel with H.E.Ed. 94)
H.E.Ed. 93-94, Supervised Teaching in Home Economics, 9 (Students must sign up in the Office of Admissions and Records, St. Paul Campus, at least 2 qtrs. prior to registration in this course. Plans for home experience prerequisite should be made with adviser)

- H.E.Ed. 192, Evaluation in Home Economics, 2 (Take parallel with H.E.Ed. 94)
H.E.Ed. 194A, Adult Education in Home Economics, 3 (Take parallel with H.E.Ed. 94)
Additional social science to total 18 cred. (See page 11)

Those whose interests lead them into further specialization in the teaching field may choose one of the following groups. The students 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:

- H.E. 54, Problems in Clothing Construction, 3
H.E. 102, Advanced Textiles, 3
H.E. 115, Economic and Social Aspects of Clothing, 3
H.E. 120, Art History, 3
Bot. 1, General Botany, 4

TEACHING FOODS

To the requirements in general teaching add:

- H.E. 45, Quantity Cookery, 6
H.E. 70, Advanced Food Preparation, 3
H.E. 142, Experimental Cookery, 3
Ag.Bi. 2, Quantitative Methods, 5

TEACHING NUTRITION

Omit from the requirements in general home economics teaching the following courses:

- H.E. 3, 4, 21, 22, 27, 34, 53, 180, G.C. 7A-C, 10A-B, and Ag.Ec. 126

To the requirements in general teaching add:

- H.E. 24, Problems in Home Planning and Furnishing, 5
H.E. 142, Experimental Cookery, 3
H.E. 173, Nutrition in Disease, 3
H.E. 179, Readings in Nutrition, 2

TEACHING RELATED ART

Those interested in teaching related art should: (a) select the minimum requirement in science when there is an option; (b) omit Ag.Ec. 126; (c) add the following courses:

- H.E. 23, Advanced Design, 3
H.E. 25, Design Applied to Crafts, 3
H.E. 120, Art History, 3
H.E. 122, Advanced Interior Design, 3, or H.E. 125, Advanced Costume Design, 3
H.E.Ed. 197, Organization and Methods for Related Art Teaching, 1-3
Six cred. from the following: Art 1, Introduction to Art, 4, Art 20, 21, Drawing and Painting I and II, 2 cred. per qtr.

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 School 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.

The courses required in the curriculum are listed below. For this specialization a grade of at least C is required for the following courses: H.E. 40, 41, 142, 170, Rhet. 22.

Students must meet the all-college requirements for graduation. (See page 13.)

FRESHMAN YEAR

- Orie. 1, College Orientation Lectures, 1
- Rhet., Communications requirement, 9
- H.E. 1, Choice and Care of Clothing, 4 (not open to H.E. srs.)
- H.E. 17, Personal and Family Living, 3 (not open to H.E. srs.)
- H.E. 20, Introduction to Related Art, 4 (not open to H.E. srs.)
- H.E. 31, Introduction to Nutrition, 3 (not open to H.E. srs.)
- H.E. 40, Food Preparation, 5
- Zool. 14-15, General Zoology, 6
- Physiol. 4, Human Physiology, 4

One of the following: In.Ch. 1-2, 4-5, 6-7, 9-10, General Inorganic Chemistry, 8 or 10 cred.

- Ag.En. 35, Household Physics, 5 (Students with one year of high school physics may be exempt from this requirement)
- Soc. 1, Introduction to Sociology, 3
- P.E., Physical Education, 3 (may be completed at any time during 4 yrs.)
- Psy. A, Elementary Psychology, 5, or Psy. 1-2 (See soph. list)

SOPHOMORE YEAR

- H.E. 24, Problems in Home Planning and Furnishing, 5
- H.E. 41, Food Management and Marketing, 5
- H.E. 45, Quantity Cookery, 6

- H.E. 46, Cafeteria Experience, 3
- H.E. 49, Household Equipment, 3
- Psy. 1-2, General Psychology, 6, or Psy. A (See fr. list)
- Rhet. 22, Public Speaking, 3
- One of the following: Rhet. 31, English Literature I, 5; Rhet. 32, English Literature II, 3; Rhet. 33, American Life in American Literature, 3; or Rhet. 60 (See jr.-sr. list)
- Ag.Bi. 1, Introduction to Organic Chemistry, 5
- Ag.Ec. 3, Principles of Economics, 5
- Bact. 53, General Bacteriology, 5
- Jour. 11, Introduction to Reporting, 3
- Jour. 18, Principles of Advertising, 3, or B.A. 188 (See jr.-sr. list)

JUNIOR AND SENIOR YEARS

- P.H. 52a-b, Health Care of the Family, 3
- H.E. 50, Textiles, 3
- H.E. 70, Advanced Food Preparation, 3
- H.E. 71, Demonstrations, 1
- H.E. 85, Home Management Principles, 3
- H.E. 86, Home Management Laboratory, 4
- H.E. 120, Art History, 3
- H.E. 140, New Developments in Food Preparation, 3
- H.E. 142, Experimental Cookery, 3
- H.E. 146, Special Food Problems, 3
- H.E. 170, Nutrition of the Family, 3
- H.E. 171, Child Nutrition, 3
- H.E. 179, Readings in Nutrition, 2
- H.E.Ed. 90, Child Training, 3
- Psy. 56, Psychology of Advertising, 3
- B.A. 188, Advertising, 3, or Jour. 18 (See soph. list)
- One of the following: Ag.Ec. 126, Economics of Consumption, 3; Econ. 185, Economics of Marketing, 3; B.A. 167, Personnel Administration, 3; Econ. 161, Labor Problems and Trade Unions, 3
- Rhet. 51, Exposition, 3
- Rhet. 60, Contemporary Literature, 3, or Rhet. 31, 32, 33 (See soph. list)
- Any two of the following: G.C. 26a, Photography, 3, or Jour. 10, Photography, 3; Jour. 41, Editing for nonmajors, 3; Jour. 69, Newspaper and Magazine Articles, 3; An.Hu. 50, Meat Selection and Utilization, 3; Rhet. 54, Advanced Public Speaking, 3

RELATED ART

The curriculum in Related Art and Business is planned to give students a background in the applications of color and design leading primarily to work in department stores, interior furnishing studios, and dress and specialty shops. In addition to the required basic courses listed below, it is highly desirable to have practical retailing experience before graduation. This may be obtained through vacation-time work as well as elective retailing courses.

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.

For this 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 student learn to use a typewriter.

Students must meet the all-college requirements for graduation. (See page 13.)

FRESHMAN YEAR

- Orie. 1, College Orientation Lectures, 1
 H.E. 1, Choice and Care of Clothing, 4 (not open to H.E. srs.)
 H.E. 17, Personal and Family Living, 3 (not open to H.E. srs.)
 H.E. 20, Introduction to Related Art, 4 (not open to H.E. srs.)
 H.E. 21-22, Color and Design I and II, 6
 H.E. 31, Introduction to Nutrition, 3 (not open to H.E. srs.)
 H.E. 40, Food Preparation, 5
 Rhet., Communications requirement, 9
 G.C. 10A, B, Human Biology I and II, 6
 P.H. 3, Personal Health, 2, and P.H. 4, Health Problems of Adult Life, 2 (These courses are not accepted for teaching. Take instead G.C. 10A, B, Dy.Hu. 20, and P.H. 52a-b)
 Ag.En. 35, Household Physics, 5, or G.C. 7A, Elements of Physics, 5 (Those with one yr. of high school physics may be exempt from this requirement)
 G.C. 7C, Elements of Chemistry, 5
 Soc. 1, Introduction to Sociology, 3
 Hist. 1-2, Civilization of the Modern World, 6, or Hist. 17, Modern Economics and Social Problems, 5
 Psy. A, Elementary Psychology, 5, or Psy. 1-2 (See soph. list)
 P.E., Physical Education, 3 (may be completed any time during 4 yrs.)
 Art 1, Introduction to Art, 4
 Art 20, 21, Drawing and Painting I, 2 cred. per qtr.

SOPHOMORE YEAR

- H.E. 23, Advanced Design, 3
 H.E. 25, Design Applied to Crafts, 3
 H.E. 27, Related Art Problems, 3
 H.E. 34, Nutrition Problems, 4, or H.E. 76 (See jr.-sr. list)
 H.E. 41, Food Management and Marketing, 5
 H.E. 49, Household Equipment, 3
 Rhet. 22, Public Speaking, 3
 One of the following: Rhet. 31, English Literature I, 5, Rhet. 32, English Literature II, 3, Rhet. 33, American Life in American Literature, 3, or Rhet. 60 (See jr.-sr. list)
 One of the following: Comp. 27-28, Advanced Writing, 6; Comp. 7, Composition Review, 3; Rhet. 26, Original Writing, 3; Jour. 11, Introduction to Reporting, 3; Jour. 41, Editing for Nonmajors, 3; or 5 or 6 additional cred. in English Literature
 Ag.Ec. 3, Principles of Economics, 5, or Econ. 6-7, Principles of Economics, 10

- Psy. 1-2, General Psychology, 6, or Psy. A (See fr. list)
 Jour. 18, Principles of Advertising, 3, or Psy. 56 or B.A. 188 (See jr.-sr. list)

JUNIOR AND SENIOR YEARS

- H.E. 50, Textiles, 3
 H.E. 76, Nutrition, 4
 H.E. 85, Home Management Principles, 3
 H.E. 86, Home Management Laboratory, 4
 H.E. 120, Art History, 3
 H.E. 121, Textile Design, 3
 H.E. 122, Advanced Interior Design, 3
 H.E. 125, Advanced Costume Design, 3 (This course may be omitted for those who are specializing in Interior Furnishing)
 H.E. 180, Home Planning and Furnishing, 5
 Rhet. 51, Exposition, 3
 Rhet. 60, Contemporary Literature, 3, or Rhet. 31, 32, 33 (See soph. list)
 Ag.Ec. 126, Economics of Consumption, 3
 Psy. 56, Psychology of Advertising, 3, or B.A. 188, Advertising, 3, or Jour. 18 (See soph. list)
 One of the following: Jour. 41, Editing for Nonmajors, 3; Comp. 27-28, Jour. 11, Rhet. 26 (See soph. list); or 5 or 6 additional cred. in English Literature
 H.E.Ed. 90, Child Training, 3
 B.A. 114, Retail Store Management, 3
 Additional social science to total 18 cred. (See page 11)

Costume Design

To the general courses listed under Related Art add:

- H.E. 3-4, Clothing Construction A and B, 6
 H.E. 115, Social and Economic Aspects of Clothing, 3

Omit:

- H.E. 122, Advanced Interior Design, 3

Journalism

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. A total of 18 credits is required in Composition 27-28 and Journalism courses.

To the required courses listed under Related Art add:

- Comp. 27-28, Advanced Writing, 6
 Jour. 11, Introduction to Reporting, 3
 Jour. 41, Editing for Nonmajors, 3
 Jour. 65, Graphic Arts: Processes, 3
 Jour. 69, Newspaper and Magazine Articles, 3

Omit:

- Art 20, 21, Drawing and Painting I and II, 2 cred. per qtr.

TEXTILES AND CLOTHING

For those who wish to specialize in Textiles and Clothing in Business the courses listed below are required. It

is recommended also that a student learn to use a typewriter.

A grade of at least C is required in the following courses: H.E. 3, 4, 21, 22, 50, 102, 107, 115.

Students must meet the all-college requirements for graduation. (See page 13.)

FRESHMAN YEAR

- Orie. 1, College Orientation Lectures, 1
 H.E. 1, Choice and Care of Clothing, 4 (not open to H.E. srs.)
 H.E. 3, Clothing Construction A, 3
 H.E. 17, Personal and Family Living, 3 (not open to H.E. srs.)
 H.E. 20, Introduction to Related Art, 4 (not open to H.E. srs.)
 H.E. 21-22, Color and Design I and II, 6
 H.E. 31, Introduction to Nutrition, 3 (not open to H.E. srs.)
 H.E. 40, Food Preparation, 5
 Rhet., Communications requirement, 9
 Ag.En. 35, Household Physics, 5 or G.C. 7A, Elements of Physics, 5 (Students with one year of high school physics may be exempt from this requirement)
 P.E., Physical Education, 3 (May be taken at any time during four yrs.)
 Soc. 1, Introduction to Sociology, 3
 Psy. A, Elementary Psychology, 5, or Psy. 1-2 (See soph. list)
 Bot. 1, General Botany, 3

Take Group I or II

Group I

- Zool. 14-15, General Zoology, 6
 Physiol. 4, Human Physiology, 4
 Dy.Hu. 20, Household Microbiology, 4, or Bact. 53 (See soph. list)

Group II

- G.C. 10A-B, Human Biology, 6
 Dy.Hu. 20, Household Microbiology, 4, or Bact. 53 (See soph. list)
 One of the following: Chem. 1-2, 4-5, 6-7, 9-10, General Inorganic Chemistry, 8 or 10 cred.; or G.C. 7C, Elements of Chemistry, 5 (Omit G.C. chem. for textile testing)

SOPHOMORE YEAR

- H.E. 4, Clothing Construction B, 3
 H.E. 27, Related Art Problems, 3
 H.E. 34, Nutrition Problems, 4, or H.E. 76, or H.E. 170-171 (See jr.-sr. list)
 H.E. 49, Household Equipment, 3
 Rhet. 22, Public Speaking, 3
 One of the following: Rhet. 31, English Literature I, 5; Rhet. 32, English Literature II, 3; Rhet. 33, American Life in American Literature, 3; Rhet. 60 (See jr.-sr. list)

- Bact. 53, General Bacteriology, 5, or Dy.Hu. 20 (See fr. list)
 Ag.Bi. 1, Introduction to Organic Chemistry, 5
 Ag.Ec. 3, Principles of Economics, 5, or Econ. 6-7, Principles of Economics, 10
 Ag.Ec. 25, Principles of Accounting, 4, or Econ. 24-25, Principles of Accounting, 6
 Psy. 1-2, General Psychology, 6, or Psy. A (See fr. list)

JUNIOR AND SENIOR YEARS

- P.H. 52a-b, Health Care of the Family, 3
 H.E. 50, Textiles, 3
 H.E. 76, Nutrition, 4, or H.E. 34, or H.E. 170-171
 H.E. 85, Home Management Principles, 3
 H.E. 86, Home Management Laboratory, 4
 H.E. 102, Advanced Textiles, 3
 H.E. 115, Economic and Social Aspects of Clothing, 3
 H.E. 120, Art History, 3
 H.E. 170, Nutrition of the Family, 3, and H.E. 171, Child Nutrition, 3; or H.E. 34 (See soph. list), or H.E. 76
 H.E. 180, Home Planning and Furnishing, 5
 Rhet. 51, Exposition, 3
 Rhet. 60, Contemporary Literature, 3, or Rhet. 31, 32, 33 (See soph. list)
 Ag.Ec. 126, Economics of Consumption, 3
 B.A. 77, Survey of Marketing, 3
 B.A. 114, Retail Store Management, 3
 B.A. 188, Advertising, 3
 H.E.Ed. 90, Child Training, 3
 Psy. 56, Psychology of Advertising, 3

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

Store and Other Commercial

Enterprises

- H.E. 53, Advanced Clothing, 3
 French 1, Beginning French, 5 (or one yr. of high school French)

Journalism

- Comp. 27-28, Advanced Writing, 6
 H.E. 53, Advanced Clothing, 3
 Jour. 11, Introduction to Reporting, 3
 Jour. 41, Editing for Nonmajors, 3
 Jour. 69, Newspaper and Magazine Articles, 3

Textiles Testing

- H.E. 107, Textile Analysis, 3
 P.H. 110, Biometric Principles, 3, and P.H. 111, Biostatistics Laboratory, 2, or Ag.Ec. 90, Agricultural Statistics, 5
 Ag.Bi. 2, Quantitative Methods, 5
 Additional social science to total 18 cred. (See page 11)

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 in camps, hotels, restaurants, or tearooms where food is prepared and served in large quantities.

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.

It is recommended 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.

Courses required in the curriculum are listed below. A grade of at least C is required in the following courses: H.E. 40, 41, 45, 46, 64, 65, 170.

Students must meet the all-college requirements for graduation. (See page 13.)

FRESHMAN YEAR

- Orie. 1, College Orientation Lectures, 1
- H.E. 1, Choice and Care of Clothing, 4 (not open to H.E. srs.)
- H.E. 6, Institution Experience, 3 (not open to nonmajors)
- H.E. 17, Personal and Family Living, 3 (not open to H.E. srs.)
- H.E. 20, Introduction to Related Art, 4 (not open to H.E. srs.)
- H.E. 31, Introduction to Nutrition, 3 (not open to H.E. srs.)
- H.E. 40, Food Preparation, 5
- Rhet., Communications requirement, 9
- One of the following: Chem. 1-2, 4-5, 6-7, 9-10, General Inorganic Chemistry, 8 or 10 cred.
- Ag.En. 35, Household Physics, 5, or G.C. 7A, Elements of Physics, 5 (Students who have had one yr. of high school physics are exempt from this req.)
- Soc. 1, Introduction to Sociology, 3
- P.E., Physical Education, 3 (may be taken any time during the 4 yrs.)
- Psy. A, Elementary Psychology, 5, or Psy. 1-2 (See soph. list)

Take Group I or II

Group I

- Zool. 14-15, General Zoology, 6
- Physiol. 4, Human Physiology, 4

- Dy.Hu. 20, Household Microbiology, 4, or Bact. 53 (See soph. list)

Group II

- G.C. 10A-B, Human Biology, 6
- Dy.Hu. 20, Household Microbiology, 4, or Bact. 53 (See soph. list)

SOPHOMORE YEAR

- H.E. 24, Problems in Home Planning and Furnishing, 5
- H.E. 41, Food Management and Marketing, 5
- H.E. 45, Quantity Cookery, 6 (open only to home economics students registered in this college)
- H.E. 46, Cafeteria Experience, 3 (Open only to home economics students registered in this college)
- H.E. 49, Household Equipment, 3
- Rhet. 22, Public Speaking, 3
- One of the following: Rhet. 31, English Literature I, 5; Rhet. 32, English Literature II, 3; Rhet. 33, American Life in American Literature, 3; or Rhet. 60 (See jr.-sr. list)
- Bact. 53, General Bacteriology, 5, or Dy.Hu. 20 (See fr. list)
- Ag.Bi. 1, Introduction to Organic Chemistry, 5
- Ag.Ec. 3, Principles of Economics, 5, or Econ. 6-7, Principles of Economics, 10
- Ag.Ec. 25, Principles of Accounting, 4, or Econ. 24-25, Principles of Accounting, 6
- Soc. 2, Intermediate Sociology, 5, or Soc. 14, Rural Sociology, 3
- Psy. 1-2, General Psychology, 6, or Psy. A (See fr. list)

JUNIOR AND SENIOR YEARS

- P.H. 52a-b, Health Care of the Family, 3
- H.E. 50, Textiles, 3
- H.E. 64, Institution Buying, 4
- H.E. 65, Institution Management Problems, 3
- H.E. 70, Advanced Food Preparation, 3
- H.E. 85, Home Management Principles, 3
- H.E. 86, Home Management Laboratory, 4
- H.E. 142, Experimental Cookery, 3
- H.E. 170, Nutrition of the Family, 3
- H.E. 171, Child Nutrition, 3
- H.E. 173, Nutrition in Disease, 4
- H.E.Ed. 90, Child Training, 3
- Rhet. 51, Exposition, 3
- Rhet. 60, Contemporary Literature, 3, or Rhet. 31, 32, 33 (See soph. list)
- P.H. 100, Elements of Preventive Medicine and Public Health, 5, or P.H. 102, Environmental Sanitation I, 3
- Ag.Ec. 126, Economics of Consumption, 3
- B.A. 77, Survey of Marketing, 3, or Ag.Ec. 40, Principles of Marketing Organization, 3
- One of the following: B.A. 167, Introduction to Industrial Relations, 3; Econ. 161, Labor Problems, 3; Psy. 160, Psychology in Personnel Work, 3; or Psy. 56, Psychology of Advertising, 3
- An.Hu. 50, Meat Selection and Utilization, 3
- Recommend H.E. 146, Special Food Problems, as an elective
- Additional social science to total 18 credits (See page 11)

VI. Home Economics and Nursery School Education

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 director of the School 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 listed under Methods and Directed Teaching in the Bulletin of the College of Education.

Students must meet the all-college

requirements for graduation. (See page 13.)

JUNIOR-SENIOR COURSES

- Ed.T. 55, Principles of Early Childhood Education, 3
 - C.W. 80, Child Psychology, 3
 - Ed.T. 57, Nursery School-Kindergarten Laboratory in Art, Literature, and Social Studies, 5
 - Ed.T. 58, Nursery School-Kindergarten Laboratory in Permanent Play Materials, Music, and Science, 5
 - Ed.T. 77, Directed Teaching in the Nursery School, 4
- Additional social science to total 18 credits (See page 11)

VII. Home Economics Extension

A combined curriculum with the College of Education. See all-college requirements for students in this college, page 13.

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

The student following this curriculum should have a real interest in rural life and rural people and the ability to get along with them. A sense of humor, good health, a high degree of initiative, good standards of personal appearance, good judgment, and ideals for rural family living are important qualities for the extension worker. The ability to organize ideas and to express them clearly in oral or written form is necessary. The extension worker should be a person alert to social situations and the need 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 will 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 to organize and administer adult and youth programs, and 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 a 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 preparing for home extension should modify the General Home Economics curriculum as follows:

Omit the following from the required courses:

- H.E. 53, Ag.Bi. 1, Rhet. 51, H.E.Ed. 92, 94, 192, Ag.Ec. 126

Add the following to the required courses:

- Pub. 53, Publicity, 3
- One of the following: Soc. 2, Individual and Group Adjustment, 3; Soc. 14, Rural Sociology, 3; Soc. 91, Case Methods Applied to the Study of Human Problems, 3; Soc. 95, Introduction to Public Welfare, 3; Soc. 140, Social Organization, 3
- H.E.Ed. 95, Field Experience for Home Demonstration Agents, 6
- H.E.Ed. 194A, Adult Education in Home Economics, 3
- Ag.Ec. 8, Rural Economics, 3, or Ag.Ec. 126, Economics of Consumption, 3

The required 3 credits in physical education are to be chosen from the dance (country, folk, modern, or social) and recreational games.

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 or 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 courses listed below are required for all students taking these curricula.

Students must also meet the all-college requirements for graduation. (See page 13.)

FRESHMAN YEAR

- Orie. 1, College Orientation Lectures, 1
- H.E. 1, Choice and Care of Clothing, 4 (not open to H.E. srs.)
- H.E. 17, Personal and Family Living, 3 (not open to H.E. srs.)
- H.E. 20, Introduction to Related Art, 4 (not open to H.E. srs.)
- H.E. 31, Introduction to Nutrition, 3 (not open to H.E. srs.)
- H.E. 40, Food Preparation, 5
- Rhet., Communications requirement, 9
- Zool. 14-15, General Zoology, 6
- Dy.Hu. 20, Household Microbiology, 4, or Bact. 53 (See soph. list)
- Physiol. 4, Human Physiology, 4
- One of the following: Chem. 1-2, 4-5, 6-7, 9-10, General Inorganic Chemistry, 8 or 10 cred.
- One of the following: Ag.En. 35, Household Physics, 5; Phys. 1-2-3, Introduction to Physical Science, 9; Phys. 1a-2a-3a, Introduction to Physical Science, 12; Phys. 4-5-6, General Physics, 15; Phys. 7-8-9, General Physics, 15
- Soc. 1, Introduction to Sociology, 3
- P.E., Physical Education, 3 (may be taken at any time during 4 yrs.)
- Math., Mathematics, 10
- Psy. A, Elementary Psychology, 5, or Psy. 1-2 (See soph. list)

SOPHOMORE YEAR

- H.E. 24, Problems in Home Economics Planning and Furnishing, 5, or H.E. 180 (See jr.-sr. list)
- H.E. 49, Household Equipment, 3
- Rhet. 22, Public Speaking, 3
- One of the following: Rhet. 31, English Literature I, 5; Rhet. 32, English Literature II, 3; Rhet. 33, American Life in American Literature, 3; or Rhet. 60 (See jr.-sr. list)
- Bact. 53, General Bacteriology, 5, or Dy.Hu. 20 (See fr. list)

- Ag.Bi. 1, Introduction to Organic Chemistry, 5, or Or.Ch. 61-62, Elementary Organic Chemistry, 8
- Ag.Bi. 2, Quantitative Methods, 5, or An.Ch. 1-2, Quantitative Analysis, 10, or An.Ch. 7, Quantitative Analysis, 4
- Ag.Ec. 3, Principles of Economics, 5, or Econ. 6-7, Principles of Economics, 10
- Psy. 1-2, General Psychology, 6, or Psy. A (See fr. list)

JUNIOR AND SENIOR YEARS

- P.H. 52a-b, Health Care of the Family, 3
- H.E. 50, Textiles, 3
- H.E. 85, Home Management Principles, 3
- H.E. 86, Home Management Laboratory, 4
- H.E. 170, Nutrition of the Family, 3
- H.E. 180, Home Planning and Furnishing, 5, or H.E. 24 (See soph. list)
- Rhet. 51, Exposition, 3
- Rhet. 60, Contemporary Literature, 3, or Rhet. 31, 32, 33 (See soph. list)
- H.E.Ed. 90, Child Training, 3
- Additional social science to total 18 cred. (See page 11)

A. MAJOR IN EXPERIMENTAL FOODS

In addition to the foregoing courses, a major sequence in experimental foods must include the following: H.E. 41, Food Management and Marketing, 5, and H.E. 70, Advanced Food Preparation, 3.

B. MAJOR IN NUTRITION

A major sequence in nutrition, which may include courses clearly related or fundamental thereto, requires a total of 24 to 36 credits which must include, in addition to the required courses listed above, the following courses:

- H.E. 41, Food Management and Marketing, 5, H.E. 142, Experimental Cookery, 3
- H.E. 33, Nutrition I, 4, and H.E. 171, Child Nutrition, 3.

A minor sequence requires 10 to 12 credits to be chosen outside the field of nutrition, e.g., bacteriology, biochemistry, economics, physics, physiology, sociology, or statistics. It must not include any of the courses that are required of all students in the curriculum.

Modern language, 9 credits

C. MAJOR IN TEXTILES AND CLOTHING

A major sequence in textiles and clothing, which may include courses clearly related or fundamental thereto,

requires a total of 24 to 36 credits which must include, in addition to the required courses listed above, the following courses:

H.E. 3, Clothing Construction A, 3, and H.E. 102, Advanced Textiles, 3.

A minor sequence requires 10 to 12

credits to be chosen outside the field of textiles and clothing, e.g., biochemistry, botany, economics, physics, or statistics. It must not include any of the courses that are required of all students in the curriculum.

Modern language, 9 credits

IX. Journalism-Home Economics (Major)

This curriculum prepares students for professional work in areas of newspaper, magazine, advertising, radio, public relations, and other journalistic activity in which proficiency in home economics subject matter is necessary. The curriculum offers a major journalism sequence combined with general home economics background and specialization in selected home economics

fields. Its flexibility makes it possible to suit requirements to the individual needs of each student. Students electing the curriculum register in the College of Science, Literature, and the Arts. They design their programs in consultation with major advisers in both the School of Journalism and the School of Home Economics.

X. Home Economics Education

PROFESSIONAL FIVE-YEAR CURRICULUM

This is a joint curriculum between the College of Education and the College of Agriculture, Forestry, Home Economics, and Veterinary Medicine leading to the degree of master of education (M.Ed.).

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 credits in academic fields
- b. A teaching minor or concentration in an academic field (18 cred.)
- c. Broad major field specialization (approximately 90 cred.)
- d. 35 cred. in education including one quarter internship (optional)—8 cred. allowed for 1 qtr.)

The best results may be anticipated when plans for the extended training are made during the student's junior year 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 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—

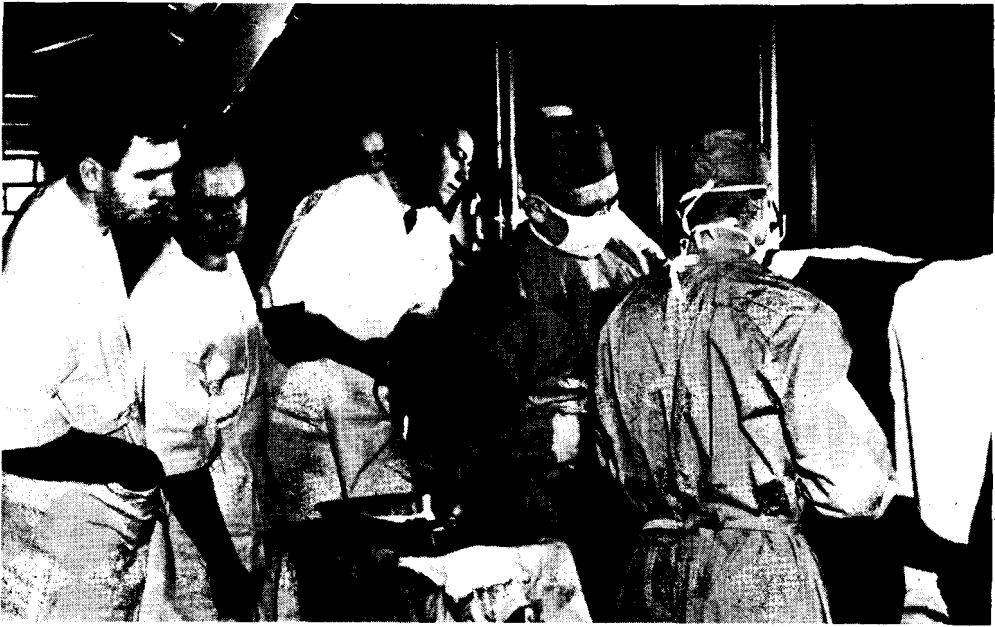
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|--------------------------------|------------------|
| 1. Additional academic courses | 8 to 24 credits |
| 2. Home Economics | 17 to 25 credits |
| 3. General Education | 4 to 9 credits |
| 4. Home Economics Education | 5 to 9 credits |

45

Satisfactory completion of the fifth year of 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 major field
4. An oral examination by the graduate committee of the College of Education and a representative of the School 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.



Veterinary Students Observing Operating Techniques

SCHOOL OF VETERINARY MEDICINE

The School of Veterinary Medicine provides a four-year professional curriculum leading to the degree of doctor of veterinary medicine.

The various fields open to graduate veterinarians include: (1) practice; (2) veterinarian and junior veterinarian in the United States Department of Agriculture, Bureau of Animal Industry; (3) research and teaching 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.

I. Preveterinary Curriculum

Farm Experience—Every prospective student in this curriculum is urged to obtain, before entering college, at least six months' practical experience on a farm. Entering students whose farm 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.

Requirements for Admission to the Preveterinary Curriculum—The student must fulfill the general requirements for admission to the under-

graduate colleges of the University and, specifically, the requirements for admission to the curricula in Agriculture. The only exception to the latter is that admission to the Preveterinary Curriculum requires the presentation of a major in Group A, English, and a minor in Group D, mathematics. A minor is recommended in either Group B, foreign languages, or Group E, natural sciences. (See Bulletin of General Information.)

Preveterinary Requirements—A minimum of 90 quarter credit hours of work on the college level is required of all

students prior to entrance upon the four years' professional veterinary curriculum. These must include the following:

- English or Rhetoric (Communications) and Public Speaking—12 credits
- Chemistry—25 credits including general inorganic chemistry, qualitative and quantitative analysis and organic chemistry
- Mathematics—minimum of 5 credits and minimum of college trigonometry
- Biology—10 credits
- Animal, Poultry, and Dairy Husbandry—15 credits
- Physics—8 credits including laboratory
- Electives (social sciences)—15 to 18 credits

It is recommended that elective credits over and above the required courses be taken in the social sciences such as agricultural economics, political science, psychology, sociology, and humanities. Those who desire to be eligible for the B.S. degree at the completion of the first two years of professional training should plan to complete 18 credits in social sciences. (See page 11.)

SUGGESTED PREVETERINARY CURRICULUM

FIRST YEAR

- An.Hu. 1, Livestock Production, 4
- An.Hu. 8, Breeds of Livestock, 4
- In.Chem. 1-2 or 4-5, General Inorganic Chemistry, 8; In.Chem. 11, Qualitative Analysis, 4
- Dy.Hu. 1, Elements of Dairying, 3
- Math. 6, Trigonometry, 5
- Orie. 1, College Orientation, 1
- Rhet., Communications requirement, 9
- Electives, 7-9
- Total, 45-47 credits

SECOND YEAR

- Ag.Bi. 2, Quantitative Methods, 5
- Ag.En. 24, 25, Agricultural Physics, 8
- Po.Hu. 1, Poultry Production, 4
- Or.Ch. 61, 62, Elementary Organic Chemistry, 8
- Rhet. 22, Public Speaking, 3
- Zool. 1-2-3, General Zoology, 10
- Electives, 7-10
- Total, 45-48 credits

VETERINARY MEDICINE

Training in veterinary medicine includes the two years of college level preveterinary studies just described and four years of professional work, or a total of six years.

The satisfactory completion of the required courses listed below under Professional Curriculum with not less

than a total of 232 credits is required for the degree of doctor of veterinary medicine.

Registration—Application for admission should be filed near completion of the preveterinary studies and not later than February 10. Students who have taken their preveterinary work at schools other than the University of Minnesota must submit to the Office of Admissions and Records, St. Paul Campus, at the time at which application is made, a transcript of all work taken up to that time.

To receive consideration a candidate's record must show a total number of honor points equal to 1.5 times the total number of credits in all subjects taken collectively in veterinary subjects. This is equivalent to midway between a "C" and a "B" average in the usual marking systems.

The selection of veterinary students in the professional curriculum is based upon scholastic standing in preveterinary studies, interest, character, and personal fitness for the practice of veterinary medicine as disclosed by personal interviews and letters of recommendation, and upon scores in any preliminary tests prepared by the University Testing Bureau.

Selections for admission will be made as early as possible, and the applicants will be notified promptly thereafter.

Accepted applicants will receive a statement for a preliminary fee of \$10 to be applied on the tuition for the first quarter. This must be paid within ten days and will not be returned if the applicant fails to matriculate.

Scholarship Requirements in the Professional Curriculum—1. A student shall obtain an honor point average of 0.50 or higher for any one quarter and an honor point average of 1.0 or higher, accumulative as well as for each one of the four years of work.

2. A student receiving a grade of "failure" shall automatically be dropped from the professional Curriculum in Veterinary Medicine.

3. Permission for repeating one to three quarters of work will not be given for more than one year in the four-year curriculum. An honor point average of 1.5 or higher is required for one or more quarters of work repeated.

Requirements for Bachelor's Degree—Students in veterinary medicine will be recommended for the bachelor of science degree, without designation, if they complete the following requirements:

1. Admission to the School of Veterinary Medicine.

2. Completion of the first two years of veterinary studies with an honor point average of 1.0 or above and a minimum of 192 credit hours of work.

3. Fulfillment of the all-college requirement of 18 hours of social science.

4. Completion of a minimum of nine credit hours in rhetoric, including Rhet. 22, Public Speaking.

II. Professional Curriculum

The courses listed below are required in the professional curriculum of the School of Veterinary Medicine:

FIRST YEAR

Agro. 31, Principles of Genetics, 4
 V.M. 101-102-103, Animal Anatomy, 16
 V.M. 111-112-113, Animal Histology and Embryology, 15
 V.M. 121, Animal Bacteriology, 5
 Ph.Ch. 102-103, Physiological Chemistry, 12

SECOND YEAR

V.M. 122-123, Animal Bacteriology, 10
 V.M. 135-136, Animal Physiology, 15
 V.M. 151-152-153, Animal Pathology, 15
 V.M. 161-162, Animal Parasitology, 10
 V.M. 170, Veterinary Clinical Diagnosis, 3
 Pharmacol. 101, Introduction to Pharmacology, 2
 Po.Hu. 153, Poultry Nutrition and Feeding, 3

THIRD YEAR

V.M. 106, Veterinary Surgical Anatomy, 1
 V.M. 143, Veterinary Clinical Pharmacology, 3
 V.M. 154, Veterinary Clinical Pathology, 2
 V.M. 171a, 171b, 171c, Clinical Conference, 3
 V.M. 172, Animal Surgery, 6
 V.M. 173, Special Animal Surgery, 5

V.M. 174, Advanced Animal Surgery, 3
 V.M. 177-178-179, Large Animal Medicine, 15
 V.M. 185, Small Animal Medicine, 4
 V.M. 188, 189, 190, Clinical and Laboratory Practice, 15
 V.M. 194, Veterinary Obstetrics and Problems of Animal Reproduction, 3
 Pharmacol. 105, General Experimental Pharmacology, 6
 An.Hu. 57, Livestock Feeding, 3

FOURTH YEAR

V.M. 125, Poultry Diseases, 3
 V.M. 126, Dairy Hygiene, 4
 V.M. 127, Veterinary Public Health 2
 V.M. 155, Meat Hygiene, 3
 V.M. 168, Diseases of Fur-Bearing Animals, 2
 V.M. 169, Veterinary Jurisprudence and Business Methods, 2
 V.M. 171d, 171e, 171f, Clinical Conference, 3
 V.M. 180-181, Infectious Diseases of Domestic Animals, 10
 V.M. 186, Small Animal Medicine, 4
 V.M. 191-192-193, Clinical and Laboratory Practice, 15
 V.M. 195, Veterinary Obstetrics and Problems of Animal Reproduction, 5
 V.M. 196, Veterinary Radiology, 3
 V.M. 197, Animal Diseases and Poisonous Plants, 3
 Dy.Hu. 118, Milk Production and Secretion, 3

III. Description of Courses

AGRICULTURAL BIOCHEMISTRY

This division offers two types of training: (1) courses designed to train students for research or instruction in biochemistry, and (2) courses for students whose main studies are in those other divisions which require some training in biochemistry.

Students planning to specialize in agricultural biochemistry in the Science Specialization Curriculum should secure in their junior-senior years a broad 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 61, 62, 63, 64 (14 cred.); Physics 4-5-6 or 7-8-9 (15 cred.); Mathematics through Integral Calculus; Physical Chemistry 101-102-103 (9 cred.); Agronomy and Plant Genetics 31 (4 cred.); Agricultural Biochemistry 2, 119, 120, 121, 122, 123, 129, 130, 131, 132, 133, 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.

Freshman and Sophomore Courses

1. Introduction to Organic Chemistry. An introduction to the chemistry of carbon compounds. The principles underlying the classification, structure, uses, and general properties of the various types of compounds with emphasis on those that are of biological importance. (5 cred.; soph., jr., sr.; prereq. 8 cred. in inorg. chem.) (By special cons. of adviser, General College Courses 7A and 7C will be acceptable as prereq. for H.E. students)
2. Quantitative Methods. Principles of quantitative analysis, including stoichiometric problems, practice in use of the balance and in typical gravimetric and volumetric manipulation. (5 cred.; soph., jr., sr.; prereq. 8 cred. in inorg. chem.)
3. Introduction to Biochemistry. A discussion of the fundamentals of biochemistry, chemistry of carbohydrates, proteins and fats, enzymes, colloids, hydrogen ion concentration, and other essential subject matter. (3 cred.; soph., jr., sr.; prereq. 1 or equiv.; familiarity with use of logarithms recommended)
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. (3 cred.; soph., jr., sr.; prereq. Org.Chem. 3 or equiv.)
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. (3 cred.; soph., jr., sr.; prereq. Org.Chem. 3 or equiv.)

Junior and Senior Courses

52. Biochemistry and Microbiology of Cereal Grains. Physical properties and chemical composition of cereal grains and their mill products; microorganisms associated with cereal grains and their products; the biochemistry and microbiology of grain storage, milling, malt production, and breadmaking. (3 cred.; jr., sr.; open only to students registered in the Mechanical Engineering Curriculum [Milling Option]; prereq. elem. org. chem. 5 cred. and general biology 9 cred. or equiv.) (Same as Pl.Pa. 52)

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. (6 cred.; jr., sr., grad.; prereq. 2, 6, or equiv.)
105. Same as 5 except that a term paper is required.
106. Same as 6 except that a term paper is required.
108. Chemistry of Wheat and Wheat Products. Lecture course, with collateral library reference work, on the chemical technology of the production and milling of wheat and its conversion into food. (3 cred.; jr., sr., grad.; prereq. 5)
110. Flour Laboratory Methods. A laboratory course. Analysis of wheat and its products. Designed to train students for research in the cereal industry. (3 to 5 cred.; jr., sr., grad.; prereq. 2 and parallel 108, or equiv.)
116. Advanced Animal Nutrition. Lectures and reading on the biochemistry of animal nutrition. (3 cred.; jr., sr., grad.; prereq. 6 or equiv.)
117. Laboratory Problems in Animal Nutrition. A laboratory course on methods used in nutrition studies. (3 cred.; jr., sr., grad.; prereq. 116. cons. of instr.)
118. Laboratory Problems in Biochemistry. Laboratory work in preparation and isolation of pure compounds, and special methods of identification or determination of biochemical products. (3 to 5 cred.; jr., sr., grad.; cons. of instr.)
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.; jr., sr., grad.; prereq. 3, or 3 cred. in org. chem., Phys. 9 advised)
120. Proteins. Lectures and assigned readings on composition, structure, chemical and physical properties, and the functions of proteins and amino acids. (3 cred.; jr., sr., grad.; prereq. 119 or cons. of instr.)
121. Carbohydrates. Lectures and assigned readings on the composition, structure, chemical and physical properties, and the functions of the carbohydrates. (3 cred.; jr., sr., grad.; prereq. 119 or cons. of instr.)
122. Lipides. Lectures and assigned readings on the composition, structure, chemical and physical properties, and the functions of the fats and fat-like compounds. (3 cred.; jr., sr., grad.; prereq. 119 or cons. of instr.)
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.; jr., sr., grad.; prereq. 119 or cons. of instr.)
124. Vitamins. Lectures and reading on the biochemistry of vitamins and their physiological action. (3 cred.; jr., sr., grad.; prereq. 6 or equiv.)
129. Colloids Laboratory. Methods for the preparation, purification, and study of the physico-chemical properties of inorganic and biocolloid systems. (2 cred.; jr., sr., grad.; prereq. 2 or equiv., parallel 119)
130. Proteins Laboratory. Preparation, identification, and analysis of proteins and their hydrolytic products. (2 cred.; jr., sr., grad.; prereq. 2 or equiv., parallel 120)
131. Carbohydrate Laboratory. Preparation, identification, and analysis of sugars and polysaccharides. (2 cred.; jr., sr., grad.; prereq. 2 or equiv., parallel 121)
132. Lipides Laboratory. Preparation, identification, and analysis of the lipides. (2 cred.; jr., sr., grad.; prereq. 2 or equiv., parallel 122)
133. Enzymes Laboratory. Preparation and measurement of enzymes and study of their properties. (2 cred.; jr., sr., grad.; prereq. 2 or equiv.; parallel 123)

AGRICULTURAL ECONOMICS

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

Freshman and Sophomore Courses

1. Principles of Economics I. For students in agriculture, forestry, and veterinary medicine. (3 cred.; soph., jr., sr.; no prereq.) (To receive credit for this course the student must complete both Ag.Ec. 1 and 2)

2. Principles of Economics II. For students in agriculture, forestry, and veterinary medicine. (5 cred.; soph., jr., sr.; prereq. 1)
3. Principles of Economics. For students in home economics. (5 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 this college 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. Principles of the organization of the market and of marketing enterprises, both proprietary and cooperative. (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 cooperative 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 financing the production and marketing of farm products. (5 cred.; jr., sr. in Ag. and For. only; open to soph. on petition; 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., soph. on petition)
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., soph. on petition. Graduate students may take Ag.Ec. 190, listed in Bulletin of the Graduate School)
102. Farm Organization. Characteristics of farming as a business; factors determining type of farming; tenure and selection; layout and improvements; factors affecting the selection of crops and livestock for a particular farm. (3 cred.; jr., sr., grad.; prereq. 2)
103. Farm Operation. Farm budgeting; personal and business factors affecting financial success; utilization of labor, power, and equipment; management research methods and management services. Special problem in farm planning. Field visit to well-managed farms. (3 cred.; jr., sr., grad.; 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., grad.; prereq. 2)
107. Farm Work Simplification. A study of principles and methods of accomplishing farm work in less time and with less effort. Methods of analyzing jobs, principles of motion economy, efficient working methods for different farm enterprises. Practice in planning improved working methods. (3 cred.; jr., sr., grad.; prereq. 2)
110. Economics of Agricultural Production. 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. (3 cred.; jr., sr., grad.; 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., grad.; 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., grad.; prereq. 30, 40)
135. Methods of Price Analysis. Statistical methods for study of forces determining prices, forecasting price changes, and determining "established prices." Survey of research in field. (3 cred.; sr., grad.; prereq. 131, 191)

140. Marketing Organization: Staples. Principles of production economics applied to the organization of markets and marketing organizations for the grains, tobacco, cotton, and wool. Special attention to grain marketing. (3 cred.; jr., sr., grad.; prereq. 40)
141. Marketing Organization: Dairy and Poultry Products. (3 cred.; jr., sr., grad.; prereq. 40)
142. Marketing Organization: Fruits and Vegetables. (2 cred.; jr., sr., grad.; prereq. 40)
143. Marketing Organization: Livestock and Meats. (3 cred.; jr., sr., grad.; prereq. 40)
144. Cooperative Organization. Development of cooperation in agriculture in the United States and foreign countries. Analysis of economic problems peculiar to cooperative organizations, especially of marketing agencies. (3 cred.; jr., sr., grad.; prereq. 40)
150. Advanced Farm Finance. Consideration of credit problems of farmers with special attention to institutions financing farmers. (3 cred.; jr., sr., grad.; 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., grad.; prereq. 110)
172. Economics of World Agriculture. Distribution, quality, and utilization of agricultural resources; variations in population densities and characteristics; internal organization and techniques; comparative advantage; world trade in agricultural products; national and international policies relating to agriculture; future trends and prospects. (3 cred., jr., sr., grad.; prereq. 110 or cons. of instr.)
191. Advanced Agricultural Statistics. Analysis of agricultural data by methods of correlation, partial and multiple correlation, analysis of variance and significance of results. (3 cred.; jr., sr., grad.; prereq. 90)

AGRICULTURAL EDUCATION

Courses for Undergraduate Students

1. Introduction to Agricultural Education. Orientation to employment and service in agricultural education. Qualifications of teachers, survey of preparatory offerings, and an overview of the program of agricultural education in Minnesota. (1 cred.; fr.)
54. Rural Education and Community Leadership. An appraisal of community educational agencies; the process of and responsibilities for community leadership; the role of the school in the rural community; coordination of the school with nonschool educational agencies. (3 cred.; soph., jr., sr.)
56. Rural Education through Extension Methods. Role of the Extension Service in rural education; methods and techniques of instruction in nonschool educational programs. (3 cred.; soph., jr., sr.)
81. Teaching Agriculture. Laws of learning applied to vocational agriculture. Use of the home, farm, and community in teaching agriculture. Guidance for rural youth. The Minnesota plan for vocational agriculture. Observation of learning-teaching situations. (3 cred.; jr., sr.; prereq. Ed. 55B)
82. Methods in Teaching Agriculture. Fundamentals of teaching vocational agriculture to high school students. The Future Farmers of America and use of Minnesota Vo-Ag Planning and Record Book. Observation and participation in learning-teaching situations. (3 cred.; jr., sr.; prereq. 81)
91. Supervised Teaching Experience. Supervised experience in work of agriculture instructor. Includes instruction in development of individual farming programs, contacting parents, program analysis of community needs, conducting classes, community activities, Future Farmers, and case studies. (6 cred.; sr.; prereq. 82 and C plus average in major)
101. Young Farmer Education in Agriculture. Organizing a continuing program of educational activities for farm youth not in school and not established in an occupation. Methods and techniques of instruction. Observation of young farmer programs. (2 cred.; jr., sr., grad.; prereq. 81 or cons. of instr.)

102. **Adult Education in Agriculture.** Systematic instruction for established farmers. Analysis of the farming situation with special emphasis on improved farm management. Methods and techniques of instruction, and observation of adult education program. (2 cred.; jr., sr., grad.; prereq. 81 or cons. of instr.)
103. **Methods of Instruction in Mechanized Farming.** Methods of teaching mechanized farming including organization of shop program, equipment, and management of farm shop. Preparation and use of job sheets, instruction units, and demonstrations in presenting materials and problems. Building facilities and arrangement. (3 cred.; jr., sr., grad.; prereq. 91 or cons. of instr.)
104. **Planning Program.** Developing a program of agricultural education in a community school. Integration with total school program. Administrative relationships and professional improvement. (2 cred.; sr., grad.; prereq. last qtr. undergraduate registration or cons. of instr.)
121. **Enterprise Analysis.** Analyzing the farm business as a basis for identifying problems. Planning learning experiences to improve farm management at the high school, young farmer, and adult levels. (3 cred.; prereq. sr., grad., or cons. of instr.)
141. **Supervised Farm Practice in Vocational Agriculture.** The selection, planning, supervising, and summarizing of the individual farming programs. Adaptation to meet needs of high school F.F.A. students, young farmers, and adults. (3-9 cred. per qtr.; prereq. 10 cred. in education; grad. or cons. of instr.)
145. **The Integrated Course of Study in Agriculture.** The philosophy, organization, and administration of instruction in agriculture departments in the secondary schools. (2 cred.; sr., grad.; prereq. 10 cred. in education)

AGRICULTURAL ENGINEERING

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

A professional five-year course in agricultural engineering is offered jointly with the Institute of Technology. Information about the professional curriculum is given on page 28.

Mechanized Farming

Freshman and Sophomore Courses

3. **Mechanical Drawing.** Drafting instruments and their uses. Lettering, scale reading, conventional symbols, tracings, and reproductions. Multiple view drawings, pictorial drawing, plats of surveys and contour maps. (3 cred.; no prereq.)
6. **Farm Buildings.** Arrangement, planning, and economics of farm buildings. Requirements of animal shelters, crop and machine storage buildings, and farm homes. (3 cred.; no prereq.)
7. **Farm Building Construction.** Use of carpentry tools and machines in the construction of farm buildings and farmstead equipment. Building materials and construction details. (3 cred.; no prereq.)
11. **Applied Mathematics.** Combination of 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 use. (3 cred.; prereq. 23 or equiv.) (Students with cred. in Ag.En. 54 admitted by petition only)
13. **Engines and Tractors.** Elementary principles of internal combustion engines and tractors. (3 cred.; prereq. 23 or equiv.) (Students with cred. in Ag.En. 54 admitted by petition only)

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)
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.; prereq. 11 or equiv.)
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 farm drainage in relation to plant growth, crop and land values, and farm operation and development. (3 cred.; prereq. Soils 4)
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.; prereq. Soils 4)
35. Household Physics. Lectures, laboratory, and experimental demonstrations of selected principles in physics, with special attention to those involved in household appliances and processes. (5 cred.; no prereq.)
40. Mechanical Training. Instruction and laboratory practice in rope work, belts, and lacings, cement work, soldering, tools, electric wiring. (3 cred.; no prereq.)
41. Metal Work. Instruction and laboratory practice in 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.)

Junior and Senior Courses

50. Advanced Surveying. Topographic surveys by stadia and other methods, running simple curves, cross sectioning, plotting the survey, profile buildings, grade determination, and figuring of quantities in earthwork. (3 cred.; soph., jr., sr.; prereq. 19)
54. Farm Power and Machinery. Machinery and power in agricultural production. Elementary principles, management, and preventive maintenance. (4 cred.; prereq. 41 and 23 or equiv.) (Primarily for Ag. Ed. students; students with cred. in Ag.En. 12 or 13 admitted by petition only)
55. Electricity in Agriculture. Elementary theory of electrical circuits and instruments. Study of the application of electrical energy to agriculture. Selection and maintenance of equipment. Electrical safety. (2 cred.; prereq. 11 or equiv., and 23 or equiv.) (Primarily for Ag. Ed. students)
60. Soil and Water Control. Use of engineer's level and tape. Subdivision of land. General principles and practices of farm drainage and soil erosion control. (3 cred.; prereq. 11 or equiv., and 23 or equiv., and Soils 4) (Primarily for Ag. Ed. students)
67. Rural Sanitation and Water Supply. Wells, pumps, and water supply. Sanitary water supply and sewage disposal systems for the farmstead. (3 cred.; soph., jr., sr.; prereq. 11 or equiv., and 23 or equiv., and Soils 4) (Primarily for Ag. Ed. students)
70. Dairy Engineering. A study of refrigeration equipment, steam boilers, heat transfer, insulating materials, and fluid flow as applied to the dairy processing plant. (3 cred.; jr., sr.; prereq. 23 or equiv.)
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. (4 cred.; prereq. Soils 4)
114. Buildings, Equipment, Materials, and Methods of Construction. The relation of structures and building equipment to agriculture. Lectures and special problems. (3 cred.; prereq. 6 and 7, and 3 or equiv.)
124. Agricultural Machinery and Mechanical Power Management. Machinery and power management and use and its cost as a factor in agricultural production. Lectures and special problems. (3 cred.; prereq. 9 cred. in Ag. En. including 12 and physics)

125. Topics in Agricultural Physics. Advanced study of the essential physical principles involved in the utilization of electricity in agriculture. (3 cred.; prereq. 72 or calculus and 24 and 25 or equiv.)

Engineering

The following courses are offered in the Institute of Technology and are open only to students in the Professional Five-Year Curriculum. For descriptions of courses see the Bulletin of the Institute of Technology.

18. Agricultural Automotives. (3 cred.; prereq. M.E. 131; 2 lect. and 3 lab. hrs. per week)
21. Elements of Surveying. (5 cred.; prereq. Draw. 3, M.&M. 12; 1 lect. and 12 lab. hrs. per week)
36. Rural Sanitation and Water Supply. (3 cred.; prereq. M.&M. 129; 3 lect. hrs. per week)
43. Mechanical Laboratory. (3 cred.; no prereq.; 1 lect. and 5 lab. hrs. per week)
51. Soil and Water Conservation. (3 cred.; prereq. 21, Soils 4, M.&M. 129, or reg. in M.&M. 129; 3 lect. hrs. per week)
52. Elements of Farm Machinery. (3 cred.; prereq. M.E. 24; 1 lect., 1 rec., and 3 lab. hrs. per week)
53. Farm Structures. (3 cred.; prereq. C.E. 37, or reg. in C.E. 37, M.&M. 128, Econ. 9; 1 lect., 1 rec., and 3 lab. hrs. per week)
61. Irrigation. (3 cred.; prereq. 51; 3 lect. hrs. per week)
63. Farm Structures Laboratory. (3 cred.; prereq. 53 or reg. in 53, M.&M. 141; 6 lab. hrs. per week)
73. Steam Boilers and Heat Engines. (3 cred.; prereq. 18 and M.E. 131; 2 lect. and 3 lab. hrs. per week)
106. Agricultural Hydrology. (3 cred.; prereq. 51 or special arrangement; 3 lect. hrs. per week)
107. Drainage, Irrigation, and Soil Erosion Control Design. (4 cred.; prereq. 61 and 106 or special arrangement; 2 lect. and 6 lab. hrs. per week)
- 111-112-113. Problems in Agricultural Engineering. (2 to 6 cred. per qtr.; prereq. cons. of instr.)
125. Topics in Agricultural Physics. (3 cred.; sr., grad.; prereq. 72 or calculus and 24 and 25 or equiv.)
126. Management of Agricultural Machinery. (3 cred.; prereq. 171, Ag.Ec. 102; 2 lect. and 3 lab. hrs. per week)
150. Inspection Trip. (1 cred.; no prereq.; required of senior agricultural engineers)
167. Advanced Farm Structures. (3 cred.; prereq. 53, 63, M.E. 160, C.E. 146; 1 lect., 1 rec., and 3 lab. hrs. per week)
171. Design of Agricultural Machinery. (3 cred.; prereq. 52 and M.E. 121; 1 lect. and 6 lab. hrs. per week)
172. Applied Electricity. (3 cred.; prereq. E.E. 38 or reg. in E.E. 38; 2 lect. and 4 lab. hrs. per week)

AGRICULTURAL JOURNALISM

53. Publicity. For students planning careers in agriculture or some allied industry in which the cooperation of the press and radio will be needed. (3 cred.; jr., sr.; prereq. Rhet. Comm. req.)
54. Editing Agricultural Bulletins. Intended for those who may wish to enter agricultural journalism as a profession. (3 cred.; jr., sr.; prereq. Jour. 13-14-15; 51-52, 69 or 73, or cons. of instr.)
55. Agricultural Journalism Outlets. For students who may wish to enter agricultural journalism as a profession. (3 cred.; jr., sr.; prereq. Jour. 13-14-15; 51-52, 69 or 73, or cons. of instr.)

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

AGRONOMY AND PLANT GENETICS

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

Major in Technical Agriculture—Recommended courses for a major in Technical Agriculture are the following: 21, 22, 23, 31, 132, 133, 134, 135; Pl.Pa. 1, 3, 4; Soils 5. From 3 to 6 credits in other plant science courses may be added with the approval of the adviser.

Major in 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 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 their interests.

Freshman and Sophomore Courses

1. General Farm Crops. Adaptation, distribution, production, and uses of the important field crops in the United States. (3 cred.; no prereq.)
21. Grain Crops. Production, improvement, and uses of corn, small grains, and flax. Lect. and lab. (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. Lect. and lab. (3 cred.; soph., jr., sr.; prereq. 1)
23. Forage Crops. Distribution, characteristics, production, preservation, and uses of forage crops. Lect. and lab. (4 cred.; soph., jr., sr.; prereq. 1)
24. Identification and Judging. Laboratory practice in judging crops and identification of crops, weeds, and diseases. (1 cred.; soph., jr., sr.; prereq. 1; 22 must be taken the same qtr. as a prereq.)
31. Principles of Genetics. Fundamental principles of breeding, heredity, variation, biometry, and evolution. Lect. and lab. (4 cred.; soph., jr., sr.)
52. Production and Grading of Cereal Crops. Production, harvesting, and grading of varieties and cultural methods; factors affecting quality and methods of harvesting; laboratory practice in grading small grains. (4 cred.; jr., sr.; open only to students registered in the Mechanical Engineering Curriculum [Milling Option]; prereq. 9 cred. in gen. biol. or equiv.) (Same as Soils 52.) (Offered in alternate years; not offered in 1951-52)

Junior and Senior Courses

126. Crop Judging. Laboratory practice in identification of crops, weeds, and diseases in relation to judging and grading farm crops. (4 cred.; jr., sr., grad.; prereq. 22)
132. Farm Crops Plant Breeding. Applied genetics. Methods of breeding each of the important agricultural crops. Lect. and lab. problems. (4 cred.; jr., sr., grad.; prereq. 31)
133. Pasture Crops and Management. Characteristics, distribution, establishment, renovation, and management of crops for temporary and permanent pastures. Lect., lab., and field work. (4 cred.; jr., sr., grad.; prereq. 23)
134. Seminar in Agronomy. Critical studies of problems in agronomy. (2 cred.; sr., grad.; prereq. 9 cred. in agron.)
135. Weed Control. Cultural and chemical methods of weed control; weed and seed laws pertaining to dissemination and control. Lect., lab., and field work. (3 cred.; jr., sr., grad.; prereq. 1 and Pl.Pa. 3) (Same as Pl.Pa. 135)

136. Introduction to Applied Statistics. Probability, mean, normal distribution, variance, standard error, "t" test, X^2 test, correlation, and analysis of variance. Emphasis on how to do the required computing and interpretation of results in terms of biology rather than of the mathematical background. (3 cred.; jr., sr., grad.; no prereq.)

ANIMAL HUSBANDRY

Major specialization in this division is elected by students who are chiefly interested in the production, processing, or distribution of livestock and livestock products. Vocational opportunities are offered also in the various aspects of the industry from the raising of livestock on farms to the distribution of products through retail channels. Graduates will find opportunities for positions as county agent, teacher and research worker in colleges and experiment stations, and with business firms.

Recommended courses for majors:

1. **Technical Agriculture**—An.Hu. 8, 9, 51, 52, 53, 56, 57, 58, 101, 112, 113, 116; Vet. 50, 51, 52; Agro. 23, 31, 133; Ag.Bi. 6; Ag.Ec. 40, 143.
2. **Science Specialization**—Consult adviser.

Freshman and Sophomore Courses

1. **Livestock Production.** Opportunities and problems in livestock production. Survey of methods followed in the raising of livestock. Lectures and laboratory practice in selecting, classifying, and appraising beef and dual-purpose cattle, sheep, and swine. (4 cred.; no prereq.)
8. **Breeds of Livestock.** Origin, development, characteristics, adaptations, and economic importance of the common breeds of beef and dual-purpose cattle, sheep, and swine. Judging practice in selection of breeding animals. (4 cred.; soph., jr., sr.; prereq. 1)
9. **Livestock Judging.** Lectures and practice in judging beef and dual-purpose cattle, sheep, and hogs. (3 cred.; soph., jr., sr.; prereq. 8)

Junior and Senior Courses

50. **Meat Selection and Utilization.** 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. (3 cred.; jr., sr.; Ag. and H.E. students; no prereq.)
51. **Meats and Meat Products.** Wholesale and retail meat cuts and meat products with special reference to physical and chemical properties and preservation during storage. Prices and relative economy of the various cuts. (3 cred.; jr., sr. Ag. students. Not open to students having cred. in 50)
52. **Meats. Slaughter of animals and cutting of carcasses.** Lectures, demonstrations, and laboratory; meat judging practice. (3 cred.; jr., sr.; prereq. 1, and 50 or 51)
53. **Advanced Meats.** Relation of animal form to carcass yield. Commercial wholesale and retail meat cuts. Factors affecting the quality of meat. Meat products. (3 cred.; jr., sr.; prereq. 52)
54. **Meat on the Farm.** Origin and characteristics of wholesale and retail cuts of meat. Factors affecting quality, palatability and table use of meat. Curing and lard rendering. Meat identification, carcass grading, and meat by-products. (Specifically for majors in Ag. Ed.) (3 cred.; jr., sr.; prereq. 1. Not open to students having cred. in 50 or 51)
56. **Livestock Feeding I.** Nutritional requirements of farm animals and composition and characteristics of livestock feeds. Differences in utilization of feeds by ruminants and nonruminants. (3 cred.; jr., sr.; prereq. 1)
57. **Livestock Feeding II.** Values of individual feeds and of combinations of feeds for beef cattle, sheep, swine, and horses. Feeding of farm livestock for most economical production of livestock products. (3 cred.; jr., sr.; prereq. 56)
58. **Market Classes and Grades of Livestock.** Marketing methods; stockyards operation; government standards; market reporting; sanitary regulations; transportation problems. Practice in classifying, grading, and evaluating market cattle, sheep, and swine. Visits to the South St. Paul livestock market. (3 cred.; jr., sr.; prereq. 1)

101. Livestock Selection. Competitive selection of several types and breeds of livestock. Evaluation of ancestry, performance records, and other factors as aids to observation in selecting breeding animals. Visits to stock farms. (3 cred.; jr., sr., grad.; prereq. 9)
107. Meat Problems. The wholesale cuts and grades of meat; the processing industry and utilization of by-products. Special problems, and visits to processing and merchandising establishments. (3 cred.; jr., sr., grad.; prereq. 53)
112. Animal Breeding. Applications of the physiology of reproduction and of genetics to breeding of farm animals. (3 cred.; jr., sr., grad.; prereq. Agro. 31)
113. Livestock Management. Management principles involved and problems of care in the several types of specialization in livestock production. A general course covering beef cattle, sheep, and swine. (3 cred.; jr., sr., grad.; prereq. 56-57, 112)
114. Artificial Insemination. Lectures and laboratory on the fundamentals and the techniques involved. Problems and procedures in managing artificial breeding associations. (4 cred.; jr., sr., grad.; prereq. 112 and cons. of instr.)
116. Prenatal Development of Farm Animals. Lectures and demonstrations. (4 cred.; jr., sr., grad.; prereq. cons. of instr.)

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, or (2) in technical or extension work, and (3) for graduate study in some phase relating to the dairy industry.

1. Technical Agriculture—Recommended for majors in:

- Dairy Production: Ag.Bi. 116; Ag.Ec. 40, 80, 102, 103, 104; Agro. 21, 23, 31; An.Hu. 56, 112, 113, 114; Dy.Hu. 2, 9, 51, 52, 101, 103, 104, 105, 106, 116, 117; Pl.Pa. 1; Po.Hu. 1; Soc. 114; Vet. 50-51-52
- Dairy Products: Ag.Bi. 2, 103, 119, 120, 121, 122, 123, 129; Ag.Ec. 25, 30, 40, 90, 131, 141, 144; Ag.En. 24, 25, 40, 41, 70; Dy.Hu. 3, 4, 10, 50, 51, 101, 105, 106, 110, 111, 112, 113, 114, 115; B.A. 51, 52, 53; Po.Hu. 1, 51, 154

2. Science Specialization—Consult adviser

Freshman and Sophomore Courses

1. Elements of Dairying. Lectures and demonstrations with opportunity for laboratory practice. History and development of the dairy industry. Origin, classification, and characteristics of the dairy breeds of cattle. Milk, its composition, food value, chemical and physical properties with relation to handling, sanitary milk production, and the manufacture of milk products. Dairy arithmetic. (3 cred.; prereq. entrance cred. in chem. or In.Ch. 1 or 4)
3. Testing Dairy Products. 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 two months' practical experience in a plant handling dairy products in a factory way. Reports and records of work done required. (3 cred.; soph., jr., sr.; no prereq.)
9. Dairy Cattle Judging. An analysis of the anatomy, physiology, and genetics of dairy animals on the basis of score card interpretations. Trips made to one or more dairy herds in the area. (1 cred.; soph., jr., sr.; no prereq.)
10. Dairy Products Judging. Laboratory practice in grading of milk and milk products including cream, ice cream, cheese, and butter. (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 microorganisms, 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 community. (4 cred.; 3rd. qtr. fr., soph., jr., sr.; prereq. approval of adviser and cons. of instr.)

Junior and Senior Courses

50. Dairy Bacteriology. Lectures and laboratory. Types of milk organisms; contamination of milk and how prevented; relation of milk to public health; bacteriology of dairy products. (3 or 5 cred.; 3 cred. for lect., 2 cred. for lab.; soph., jr., sr.; prereq. Bact. 53) (Lect. taken separately only with cons. of instr.)
51. Market Milk. Lectures and laboratory. 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)
52. Dairy Herd Management. Demonstration of management practices with dairy cattle. One or more trips to specialized dairy farms. (2 cred.; jr., sr.; prereq. 101, 103)
101. Milk Production. Problems of the dairy farmer, such as adaptation of dairy breeds; selection and management of dairy herd and sires; calf raising, dairy barns. (3 cred.; jr., sr., grad.; prereq. 1)
103. Dairy Stock Feeding. Application of principles of nutrition to feeding dairy animals. Feeding standards; characteristics of various feeding stuffs; formulation of rations. (3 cred.; sr., grad.; prereq. 101, An.Hu. 56)
104. Dairy Stock Selection. An evaluation of inherited characters in dairy cattle from an economic standpoint. (3 cred.; jr., sr., grad.; 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 scientific investigations in dairy husbandry. (1 cred.; sr., grad.; prereq. 3 courses in dairy husbandry)
106. Seminar II. Continuation of 105. (1 cred.; sr., grad.; prereq. 105)
110. Dairy Products: Ice Cream and Frozen Desserts. Manufacture of ice cream with special reference to chemical and physical processes involved. Organization, construction, equipment, and operation of such factories. Lect. and lab. exercises. (3 cred.; jr., sr., grad.; prereq. 1, 3)
111. Dairy Products: Butter. Manufacture of butter with special reference to chemical and bacteriological processes involved. Organization, construction, equipment, and operation of such factories. Lab. exercises. (3 cred.; jr., sr., grad.; prereq. 1, 3, 50)
112. Dairy Products: Cheese. Manufacture of cheese, with special reference to the chemical, bacteriological, and physical processes involved. Organization, construction, equipment, operation of such factories. Lect. and lab. exercises. (3 cred.; jr., sr., grad.; prereq. 1, 3, 50)
113. Technical Control. Chemical and bacteriological laboratory methods used in technical control of milk and its products. Use of Monjonnier tester, cryoscope, and bacteriological control methods. Lect. and lab. (3 cred.; sr., grad.; prereq. 50, 111, or 112)
114. Milk By-products. Manufacture of condensed milk, dry milk, and other by-products with special reference to the physical processes involved. Lect. and lab. exercises. (3 cred.; jr., sr., grad.; prereq. 1, 3)
115. Advanced Dairy Bacteriology. Investigations of specific problems on the bacteriology and mycology of milk and dairy products. (3 cred.; sr., grad.; prereq. 50, 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., grad.; prereq. 9 cred. in physiol. and Ag.Bi. 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., grad.; prereq. 101, 104, Agro. 31)
118. Milk Production and Secretion. Lectures dealing with management and nutritional problems of interest to veterinary students with special emphasis on the physiology and biochemistry of lactation. (3 cred.; sr. Vet. Med.)

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, 21, 51, 52, 55, 64; Pl.Pa. 1; Zool. 21, 50, 53, 82, 83.

Recommended minors—Agronomy, biochemistry, horticulture, plant pathology.

Whether the chosen curriculum is that of Technical Agriculture or of Science Specialization, students majoring 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 Fishery and Wildlife Management.

Freshman and Sophomore Courses

5. Economic Entomology. The life histories, habits, and methods of control of the insect pests of livestock, orchard, fields, 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. (1½ cred.; no prereq.)
21. Principles of Beekeeping. Life history, morphology, and physiology of the honeybee. Colony development. History of beekeeping. Equipment and apiary management. Chemistry and food value of honey. Pollination. Diseases of bees and their control. Economics of beekeeping. Practical laboratory and apiary work. (3 to 5 cred.; no prereq.)

Junior and Senior Courses

51. Introductory Parasitology. Elementary course dealing with parasitic protozoa, worms, and arthropods and their relation to diseases of man and animals. (5 cred.; soph. on petition, jr., sr.; prereq. Zool. 14-15 or equiv.)
52. Introductory Entomology. General morphology, life histories, habits, and classification of insects. (5 cred.; soph. on petition, 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 dealing with the principles of controlling insects that attack trees and forest products; life history and habits of important representative species. (5 cred.; jr., sr.; prereq. Zool. 14-15 or equiv.)
57. Mill Pests and Their Control. Life histories, habits, and methods of control of the insect and rodent pests of elevators, flour mills, and warehouses. Laboratory work in determination of the more important forms. (5 cred.; jr., sr.; open only to students in the Mechanical Engineering Curriculum [Milling Option]; prereq. 9 cred. in general biol. or equiv.)
63. Mammalogy. Distinguishing characteristics and life histories of the various mammal groups, particularly those represented in the state. Consideration of possibilities of fur farming in case of certain species. (4 cred.; jr., sr.; prereq. Zool. 22)
64. Introduction to Fishery and Wildlife Management. Survey of management of fishery and wildlife resources with discussion of principles and administration. Lect. and library work. (5 cred.; jr., sr.; prereq. Zool. 1-2-3 or equiv., Bot. 50, or For. 20)
114. Apiculture. Problems of bee management, disease control, wintering, bee breeding, processing, and marketing of bee products. Lect., lab., and field practice. (3 cred.; jr., sr., grad.; prereq. 9 cred. in ent.)
117. Animal Ecology. General ecology stressing ecological principles and land communities. (3 cred.; jr., sr., grad.; prereq. 15 cred. in zool. or ent.)
118. Animal Ecology. Experimental approach to study of environmental factors affecting animal populations. (3 cred.; jr., sr., grad.; prereq. 15 cred. in zool. or ent.; cons. of instr.)
119. Animal Ecology. Conditions for life in the water and distribution of aquatic animals. (3 cred.; jr., sr., grad.; prereq. 15 cred. in zool. or ent.)
120. General Ecology of Insects. Dispersal, distribution, abundance, natural control, and related problems. Lect., lab., and field work. (3 cred.; jr., sr., grad.; alternative to 119 or both may be taken; prereq. 117-118)
121. Ichthyology. Taxonomy and habits of North American fishes with special reference to those of upper Mississippi drainage. (3 cred.; jr., sr., grad.; prereq. 15 cred. in zool. or ent.)

- 125-126-127. Advanced General Entomology. Morphology, biology, and classification of insects. Lectures and laboratory. Frequent field trips in 127. (9 cred.; jr., sr., grad.; prereq. 15 cred. in zool. or ent.)
- 128-129. Insect Physiology. General and comparative physiology. Survey of the organ systems and their functioning. Emphasis on research methods and evaluation of data. Lect., lab., and reading. (8 cred.; sr., grad.; prereq. 15 cred. in zool. or ent. and cons. of instr. Zool. 50 or equiv. recommended)
140. Biological Microscopy. Necessary elements of optics, and limitations of the various types of microscopes; interpretation of microscopical data. Laboratory: demonstration plus project in field of student's interest. (4 cred.; sr., grad.; prereq. 15 cred. in zool., ent., or bot. and cons. of instr.) (Offered in alternate yrs.; not offered in 1952-53)
- 141-142. Insects in Relation to Plant Diseases. 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.; grad.; prereq. 8 cred. in ent. or pl. pa.) (Same as Pl.Pa. 141-142)
144. Medical Entomology. Principal arthropods noxious to man and animals. Emphasis on those that serve as vectors or pathogenic organisms of man and animals. Lect. and lab. (3 cred.; jr., sr., grad.; prereq. 15 cred. in zool. or ent. including 52 or equiv. and cons. of instr.)
145. Parasitic Protozoa. Structure, life histories, and economic relations of protozoal parasites of man and animals. Lect., lab. diagnosis. (3 cred.; jr., sr., grad.; prereq. 15 cred. in zool. and cons. of instr.)
146. Helminthology. Worm parasites of man and animals, their structure, life histories, and biological relationships. Lect. and lab. (3 cred.; jr., sr., grad.; prereq. 15 cred. in zool. and cons. of instr.)
150. Introduction to Aphidology. Biology and taxonomy of Aphididae. (3 cred.; jr., sr., grad.; prereq. 52 or equiv. or cons. of instr.)
- 164-165-166. Wildlife Management. Life histories, ecology, and management of North American game animals including field studies of research and management techniques at appropriate times during the year. Lect., lab., library, and field work. (9 cred.; jr., sr., grad.; prereq. 63, 64, Zool. 57-58, Bot. 50, and Pl.Pa. 53)
167. Techniques of Forest Wildlife Management. Largely field work; use of censuses applicable to major local forms of forest wildlife; preparation of a wildlife management plan for a small forested area. (3 cred.; grad.; prereq. 64. Given at Cloquet)
- 168-169. Fishery Biology and Management. Methods and theory of fishery biology; age and rate of growth, condition factor, populations, mortality and harvest, indices of productivity, lake and stream survey methods, planning, and improvement, fish pond management. Lect. and lab. (10 cred.; jr., sr., grad.; prereq. 53, 118, 119, 121, Bot. 121 or equiv., Biostat. 110, 111, or equiv., or cons. of instr.)
170. Fisheries Resources. Fisheries resources of the U.S.; fisheries products; methods and description of commercial fisheries; state, federal, and international administration of fisheries; significant laws and current legislation controlling U.S. fisheries. Organization of fishery programs. (3 cred.; jr., sr., grad.; prereq. Ent. 168, 169, or cons. of instr.)
175. Principles of Economic Entomology. Methods and principles of insect control. Lect. and lab. demonstration. (4 cred.; jr., sr., grad.; prereq. 15 cred. in ent. including Ent. 5 or equiv., or cons. of instr.)
176. Legal and Regulatory Aspects of Pest Control. Principles of quarantine and administration of control campaigns. Lect., discussions, and demonstrations. (3 cred.; jr., sr., grad.; prereq. 15 cred. in ent. including Ent. 5 or equiv., or cons. of instr.)
177. Insecticides and Their Action. Chemistry, physiological action, toxicology, and laboratory testing of insecticides. Lect. and lab. (5 cred.; sr., grad.; prereq. 15 cred. in ent. including Ent. 5 or equiv. or cons. of instr.; inorg. and org. chem.) (Offered in alternate yrs.; not offered in 1952-53)
179. Recent Advances in Entomology. Lectures in special fields of entomological research given by visiting professor. (Cred. and hrs. ar.; sr., grad.; no prereq.)

197. Introduction to Research. Preparation for investigational work in entomology, parasitology, ecology, economic zoology, or beekeeping. Advanced lab., 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., grad.; prereq. work as prescribed by the division)

FOOD TECHNOLOGY

- 51-52. Food Analysis. Chemical and physical methods of analysis of foods and food products. (2 cred. per qtr.; jr., sr.; prereq. Ag.Bi. 2 and 3) (Offered in alternate years)
- 101-102. Food Technology. Application of biochemistry and biology to food manufacturing, including effect of processing on chemical composition and nutritive value, methods of food preservation, food bacteriology, molds and fungi, insect and rodent control, food acceptance, chemical engineering operations in the food industries, food packaging. Lectures supplemented by visits to local food processing industries. (3 cred. per qtr.; jr., sr., grad.; prereq. Ag.Bi. 3 and 52, Bact. 53, and a course in physics) (Offered in alternate years)
104. Frozen Food Processing and Storage. A comprehensive study of all types of frozen foods. History and development of the industry, standards, laws, and regulations; quality in relation to temperature, rate and method of freezing; control of quality from time of harvest to packaging; packaging and wrapping; processing methods; storage, transportation, and handling. (3 cred.; jr., sr., grad.; prereq. Ag.Bi. 5 or 6, Bact. 53 or cons. of instr.)
105. Frozen Food Problems. Special problems based upon work given in Course 104. (2-4 cred. per qtr. with 6-12 cred. total; jr., sr., grad.; prereq. 104)

FORESTRY

For information about the School of Forestry see Section II of this bulletin and consult with advisers in forestry.

Freshman and Sophomore Courses

- 1A. Conservation of Natural Resources. The natural resources of the U.S. and the world; their utilization, interrelationship and management treated from an economic standpoint and related to their importance to society and our responsibility for their conservation. Lect., reports, and assigned reading. (3 cred.; no prereq.)
1. Introduction to Forestry. Brief survey of the various fields of forestry and the forest situation in the U.S. and the world. Lect., reports, and reading. (3 cred.; no prereq.)
2. Important Forest Plants. Identification and classification of the important forest plants of Itasca State Park with emphasis on forest site and type plant indicators. (1½ cred.; no prereq. Given at Itasca Park)
4. Dendrology. Forest trees of the U.S.; their classification, characteristics, and range. Lect., lab. and assigned reading. (4 cred.; no prereq.)
5. Field Forest Ecology. Forest laboratory exercises designed to give the student basic information on forest types, ecological succession, tolerance, reproduction factors, and relative growth and longevity of the important native forest tree species. (2 cred.; no prereq. Given at Itasca Park)
6. Field Measurements. Largely field work. Includes use of compass, pacing and mapping; and elementary work in tree measurements, timber cruising including the elementary use of aerial photographs, and growth determination. (2 cred.; no prereq. Given at Itasca Park)
- 7-8. Forest Measurements. Principles underlying the determination of the volume of forest products. Measurement of heights; construction of volume tables; and elementary methods of compiling and analyzing numerical data. (6 cred.; prereq. Math. 1 and 6)
9. Introduction to Forest Surveys and Aerial Photography. Principles and methods of determining the volume and growth of stands; use of aerial photographs; and application of elementary statistical methods. (3 cred.; prereq. 7 and 8)

10. Farm Forestry. Place of forestry in land-use planning. Economic status of farm woodlots. Establishment and care of woodlots and windbreaks. Forest influences with special reference to soil erosion control. Use of wood on the farm. Lect. and lab. (3 cred.; not open to students majoring in forestry; no prereq.)
20. Introduction to Range Management. History of grazing in the West. Kind of stock used. Forage plants. Regulations and methods of handling stock on national forests. Range management and protection. Lect. and reading. (3 cred.; soph., jr., sr.; no prereq.)
49. Identification of Commercial Woods. Structure, classification, and identification of domestic woods important to the woodworking industries. Lect. and lab. (2 cred.; soph., jr., sr.; not open to forestry students; no prereq.)

Junior and Senior Courses

51. Logging. (Formerly Course 151) 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.)
52. Wood Seasoning. (Formerly Course 152) Theory and practice of air seasoning, kiln drying, and new developments in the drying of wood. (3 cred.; jr., sr.; prereq. 53-54)
- 53-54. Wood Structure and Identification. Structure, classification, and identification of domestic commercial woods. Lect., lab., and reading. (6 cred.; jr., sr.; prereq. 3-4)
55. Forest Protection. (Formerly Course 155) Prevention, presuppression and suppression phases of protecting forests from wildfire, and the use of controlled burns for beneficial purposes. (3 cred.; jr., sr.; no prereq.)
56. Forest Products. Introductory survey of forest products; lumber, naval stores, tannins, wood pulp, paper, etc. Lect., reading, reports. (3 cred.; jr., sr.; no prereq.)
57. Wood Utilization. Production, distribution, qualities, amounts, manufacture and prices of wood products. Lect., reading, and reports. (3 cred.; jr., 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.; jr., sr.; prereq. 53-54)
101. Advanced Dendrology. Continuation of Course 3-4 with special studies in classification and distribution of some important timber species of the world. (3 cred.; jr., sr., grad.; prereq. 3-4)
- 111-112. Advanced Forest Measurements. Continuation of Course 9 with special emphasis on the application of statistical methods in forest measurements. (6 cred.; sr., grad.; prereq. 9 or cons. of instr.)
113. Wood Pulp and Paper. Detailed study of production of wood pulp and paper products. Lect., reading, and reports. (3 cred.; jr., sr., grad.; prereq. 53-54)
- 114-115. Mechanical and Physical Properties of Wood. Derivation and application of formulas used in determining stresses in wood. Laboratory methods in timber physics. Lect., lab., reading, class problems, and reports. (6 cred.; jr., sr., grad.; prereq. 53-54, Math. 7)
116. Fabrication and Properties of Wood Products. Use of timber connectors in heavy construction. Physical and mechanical properties of plywood and various fiber boards. Principles of glued-wood construction. Lect., lab., and reports. (3 cred.; jr., sr., grad.; prereq. 114)
119. Advanced Wood Structure. The microtechnic of wood tissue and structure, identification and classification of tropical woods. Lect., lab., and reading. (4 cred.; sr., grad.; prereq. 53-54)
120. Building Cost Estimating. A general course in building cost estimating. (3 cred.; jr., sr., grad.; no prereq.)
121. Wood Finishing. Painting and natural finishing of wood including chemical and physical principles involved in the formulation and application of finishes, preparation of surfaces, etc. (3 cred.; jr., sr., grad.; prereq. org. chem.)
123. Introduction to Forest Economics and Valuation. The economic approach to forestry; supply and demand for forest products; economic problems in private forestry practice; principles underlying the appraisal of forest values. (3 cred.; jr., sr., grad.; prereq. Ag.Ec. 2)

124. Introduction to Forest Management. Organization and administration of forest lands, both privately and publicly owned. Determination and allocation of cut. Forest management plans. (3 cred.; jr., sr., grad.; prereq. 123)
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., grad.; prereq. 53-54)
126. Forest Ecology. Study of the life history and environmental relationships of forest trees and stands, with special emphasis on the effect of such ecological factors as soil, water, temperature and light on the growth of trees. (3 cred.; jr., sr., grad.; prereq. 3 and 4 or equiv.)
127. Introduction to Silviculture. Study of the different methods of making intermediate and final cuttings in the forest. Analysis of European methods as they apply to American forest types and conditions. (3 cred.; jr., sr., grad.; prereq. 126)
- 128-129. Field Silviculture I and II. Laboratory and field work in seeding and planting, plantation surveys and maintenance, cutover-area studies, thinning and partial cutting, phenological observations, applied forest pathology and entomology. Study of established experiments on Cloquet Experimental Forest. (6 cred.; jr., sr., grad.; prereq. 126 and 127. Given at Cloquet)
130. Forest Valuation. Business and financial aspects of forest management. A study of the different factors entering into the valuation of forest property. (3 cred.; sr., grad.)
131. Forest Policy. 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. (3 cred.; sr., grad.)
133. Forest Management and Utilization. Collection of data necessary for a forest management plan, making of growth studies and preparation of maps required for such plans; study of utilization plants and production of forest products. (4 cred.; jr., sr., grad.; prereq. 124. Given at Cloquet)
134. Forest Inventory and Photographic Interpretation. Planning and conducting forest surveys; use of aerial photographs in timber estimating; forest type and contour mapping. (4 cred.; jr., sr., grad.; prereq. 9. Given at Cloquet)
136. Forest Economics. Use of economic analysis in the solution of forestry problems; analysis of cyclical and other variations in timber prices; critical analyses of suggested solutions to private forestry problems as taxation, finance, insurance, and development of markets. (3 cred.; sr., grad.; prereq. 123)
137. Seeding and Planting. Principles of seeding and planting in the establishment of forest-tree plantations. Forest nursery practices. Storage, pretreatment, and germination of forest tree seeds. Lect. and lab. (3 cred.; jr., sr., grad.; no prereq.)
140. Forest Management. Biologic, economic, and policy considerations in forest management. Problems concerned with the organization and administration of forest land under present-day conditions. Lect. and reports. (5 cred.; sr., grad.; prereq. 124, 127)
141. Principles of Silvics. Principles underlying the silvical characteristics of trees and reactions of trees to their environments. A review of silvical literature of special significance. (3 cred.; sr., grad.; prereq. 126, 127, or cons. of instr.)
142. Wood Chemistry. Clinical composition, reaction, and analyses of wood components and derivatives. Chemical technology of wood and wood products. (3 cred.; jr., sr., grad.; prereq. org. chem., For. 53-54)
143. Forest Recreation. Recreational use of the forest from an economic, sociological, and technical point of view. Administrative and technical problems arising from recreational use. (3 cred.; sr., grad.; no prereq.)
145. Advanced Silviculture. Recommended American silvicultural practices as determined by recent research studies. Recent published information on advances in silvicultural practices. (3 cred.; sr., grad.; prereq. 127, 129)
146. Forest Aerial Photogrammetry. Aerial photographs, aerial surveying, photo interpretation, and forestry applications. (3 cred.; sr., grad.; prereq. 9, 134, or cons. of instr.)

156-157. Major Report. Independent study and the preparation of a comprehensive report on some phase of general forestry, range management, or wildlife management. (2 cred. per qtr.; sr., grad.)

HOME ECONOMICS

For information about the School of Home Economics see Section II of this bulletin and consult with advisers in home economics.

Freshman and Sophomore Courses

1. Choice and Care of Clothing. Guidance in planning, selecting, and caring for the wardrobe. Principles of design and color as they relate to dress and personal appearance, and basic textile knowledge of help to the consumer. (4 cred.; fr.; not open to srs. in H.E., men, or students who have had G.C. 15; no prereq.)
3. Clothing Construction A. Cutting, fitting, pressing, and constructing dresses of rayon fabrics; commercial pattern interpretation and fitting, garment alteration, and sewing machine maintenance. (3 cred.; 3rd qtr. fr., soph.; prereq. 1)
4. Clothing Construction B. Fitting dress and sleeve forms; applying various techniques of pattern fitting or redesigning and of garment fitting, pressing and construction of wool dresses; methods of fabric renovation and repair; designing, cutting, and reconstructing garment. (3 cred.; soph., jr.; prereq. 3 or 20)
6. Institution Experience. Practical work in the cafeteria. Each student works independently under supervision of instructor. Intended to help student decide upon her specialization. (3 cred.; fr.; no prereq. Limited to 3 each qtr. For Institution Management majors, cons. of instr. Open only to H.E. students registered in this college)
17. Personal and Family Living. Democratic family living; characteristics of different age-levels; the development of personality and of family unity; the conditioning effects of family living. Discussion of problem-situations of the individual and the family. (3 cred.; fr., soph.; no prereq. Not open to srs. in H.E.)
20. Introduction to Related Art. The development of an appreciation of the art involved in the everyday life of the student, and the cultivation of a discriminating taste in varied fields such as dress and house furnishings. Arts and crafts of various countries studied briefly for their contribution to the student's breadth of view, enjoyment, and understanding of other cultures. (4 cred.; fr.; no prereq. Not open to srs. in H.E. or those who have had 56)
21. Color and Design I. Experience in applying principles of design and color to specific problems in the selection and arrangement of home furnishings; selection and framing of pictures; lettering; block printing and stenciling. (3 cred.; prereq. 20)
22. Color and Design II. Opportunity to plan suitable and becoming wardrobes for different personality and figure types. Craft problems related to costume. (3 cred.; prereq. 1 and 20)
23. Advanced Design. Experience in creative designing with emphasis on the relation of the design to the materials; techniques and their use. Aim: facility in designing. (3 cred.; soph., jr.; prereq. 21)
24. Problems in Home Planning and Furnishing. Exteriors and interiors of houses studied for their design and suitability to family and locality. Problems in planning and furnishing a home worked out on the basis of family living. Class work in combining fabrics, furniture, and accessories in rooms. Field trips. (5 cred.; soph.; prereq. 20, 49 recommended. Not open to students who have had G.C. 16, F.L. 15, H.E. 57, or H.E. 180. Not open to majors in Textiles and Clothing in Business, Related Art, and Home Economics Education)
25. Design Applied to Crafts. Emphasis upon well designed and suitable articles for use in dress and in the home which can be made with the equipment available in the typical home, such as needlework, weaving, simple metal work, leather tooling, etc. (3 cred.; prereq. 21 and 22)

27. Related Art Problems. Emphasis on home furnishings. Using house furnishing materials, the student learns good treatment and combinations of colors, forms, and textures; studies the relationship of design to materials, techniques; the needs of people and suitability to use. Some craft problems included. (3 cred.; jr., sr.; prereq. 21)
30. Introduction to Nutrition. For students wishing a discussion of the application of the principles of nutrition to the selection of food. (2 cred.; no prereq. Intended for students in S.L.A. Offered on Minneapolis Campus. Open to students in H.E. only by special cons. of director)
31. Introduction to Nutrition. Application of nutrition principles to the food selection of college students. Includes information on the relation of food to the promotion and maintenance of health. (3 cred.; fr.; no prereq. Not open to srs. in H.E. or to students having cred. for H.E. 30.)
33. Nutrition I. (1) The nature and properties of groups of compounds occurring in the body and in food, including a study of proteins, carbohydrates, lipids, and enzymes; (2) digestion; and (3) absorption. (4 cred.; soph., jr., sr.; prereq. Ag.Bi. 1, Physiol. 4 or parallel)
34. Nutrition Problems. A consideration of the problems commonly met by adults and children in typical families. (4 cred.; 3rd qtr. soph., jr., sr.; prereq. 31, 40, physiol., or hum. biol. Not open to students having cred. for H.E. 76)
35. Nutrition II. 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. Establishment of good standards for food products. (8 cred.; fr.; prereq. 2 qtrs. chem.)
41. Food Management and Marketing. Determination and study of the management factors in the food problems of the homemaker and consumer. Quality, cost, and conservation of foods. Meal planning, preparation, and service. (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; study of standardized formulas and production costs. (6 cred.; jr., sr.; prereq. 40, 41. Open only to H.E. students registered in this college)
46. Cafeteria Experience. Experience in the minor problems of cafeteria, dining hall, and tearoom administration. (3 cred.; soph., jr., sr.; no prereq. Open only to H.E. students registered in this college)
49. Household Equipment. The principles that should guide in the selection, operation, care, and convenient arrangement of equipment in the home. (3 cred.; soph.; prereq. Ag.En. 35 or cons. of instr.)

Junior and Senior Courses

50. Textiles. Consumer textile problems; the characteristics of fibers, fabrics, and modern finishes; the selection, maintenance, and serviceability of fabrics for clothing and home furnishing; laboratory study of selected fabrics. (3 cred.; jr., sr.; prereq. 1)
52. Introduction to Textiles. Factors which influence the quality and value of fabrics used in men's and women's wearing apparel and household furnishings. Designed primarily for students in merchandising. (3 cred.; no prereq. For S.L.A., B.A., U.C., and Art Ed.; written permission must be obtained from the Junior College Office)
53. Advanced Clothing. Problems in designing, fitting, and tailoring a lined wool coat or suit; use of a plaid, striped or figured fabric in the designing and construction of a garment; social and economic problems involved in children's clothing. (3 cred.; jr., sr.; prereq. 4, 50, or parallel)
54. Problems in Clothing Construction. Major emphasis on construction techniques, designing, or fitting; problems in pattern modification, draping, and the construction and evaluation of clothing illustrative material. (3 cred.; jr., sr.; prereq. 53 or cons. of instr.)

56. Applications of Color and Design I. The needs of individual students determine largely the specific content of the course. It is devoted to a general study of color and design applications in various areas, including problems relating to dress. Experiences in the arrangement of display cases. (3 cred.; no prereq. Not open to H.E. students or those who have had H.E. 20. Written permission must be obtained from the Junior College Office)
57. Applications of Color and Design II. Continuation of 56 with emphasis upon house planning and furnishing problems. Arrangement of rooms and display cases. Brief study of some of the arts and crafts of other countries to give background of appreciation and standards for judging quality. (3 cred.; prereq. 20 or 56, or cons. of instr. Not open to H.E. students or to those who have had H.E. 24 or H.E. 180. Written permission must be obtained from the Junior College Office)
58. Supervised Retail Training. Combines experience in several departments of a store or shop on Saturdays or Mondays and planned discussions during two class periods each week. Supervision and evaluation of student work by both store personnel and instructor. (4 cred.; prereq. 21, 22, 50 or parallel; Psy. A or 1-2, cons. of instr.)
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. (3 cred.; jr., sr.; prereq. 45, 46, 64)
70. Advanced Food Preparation. Continuation of Course 40, emphasizing the scientific principles that underlie cookery processes and food preservation. (3 cred.; prereq. 40, Ag.Bi. 1)
71. Demonstrations. Purposes and techniques of food demonstrations with special reference to their application in business. (1 cred.; open to 3rd qtr. jr., sr.; prereq. 41)
76. Nutrition. Application of the principles of nutrition to the problems of food selection most commonly met in everyday living. (4 cred.; jr., sr.; prereq. 30 or 31 and 40. Not open to students having cred. for H.E. 34)
79. Selected Problems for Dietitians. Problems related to the work of the dietitian involving discussions, readings, and field trips. (3 cred.; jr., sr.; prereq. 170 or equiv. Open only to H.E. students registered in this college)
85. Home Management Principles. Managerial aspects of homemaking; work simplification of household activities; financial records and budget-making for the individual and the family. (3 cred.; jr., sr.; prereq. 40, 41 advised)
86. Home Management Laboratory. Residence for one-half quarter in one of the two home management houses, with direct experience in managing and sharing activities and responsibilities. (4 cred.; jr., sr.; prereq. 85 or parallel, 40, 41 advised, P.H. 52a,b)
89. Special Problems in Household Equipment. A further study of certain pieces of equipment with emphasis on efficiency in operation including demonstration techniques. (3 cred.; jr., sr.; prereq. 49, Ag.En. 35, cons. of instr.)
98. Home Economics Extension. 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 reference to the nature of the raw materials; economic, chemical, and physical problems involved in their manufacture and use; the measurement and significance of the physical characteristics of yarns and fabrics. (3 cred.; jr., sr., grad.; prereq. 50, Ag.Bi. 1, Ag.Ec. 3 or parallel)
107. Textile Analysis. Application of quantitative methods in the analysis of textile materials, with special reference to fiber composition and finishes. (3 cred.; jr., sr., grad.; prereq. 50, Ag.Bi. 1, 2)
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, Ag.Ec. 3)

116. Family Clothing Problems. The buying of clothing, governmental controls of production; the simplification of clothing, labeling and standardization, 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. 3, 50)
120. Art History. A general view of the history of art from the Egyptian period to the present. The painting, sculpture, architecture, furniture, and costume of the past studied for their present influences and contributions and their significance to contemporary houses and furnishings and to dress. Field trips. (3 cred.; sr. col. and grad only)
121. Textile Design. Historic and modern textile designs and designers. Original designs applied to textiles by means of silk screen, stencil, batik, and block print techniques. (3 cred.; jr., sr.; prereq. 23, 27, 50)
122. Advanced Interior Design. Small-house interiors designed and elevation drawings rendered in color. Studies and reports on modern trends, designers and their work, and other topics of practical and historic interest. Actual materials used as far as possible. Field trips to shops and homes. (3 cred.; jr., sr.; prereq. 27, 120, or cons. of instr.)
125. Advanced Costume Design. Modern and historic costume. Studies and reports on selected topics. Problems in draping and sketching designs for various figure types. Pencil, crayon, and watercolor techniques. (3 cred.; jr., sr.; prereq. 3, 22, 25 recommended, or cons. of instr.)
140. New Developments in Food Preparation. Demonstrations, discussions, and some laboratory work illustrating recent trends in food preparation. (3 cred.; jr., sr., grad.; prereq. 40 or equiv.)
142. Experimental Cookery. An intensive study of problems in foods and food preparation by means of individual laboratory problems. (3 cred.; jr., sr.; prereq. 40, Ag.Bi. 1)
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. (4 cred.; jr., sr.; prereq. 31, 40, Ag.Bi. 1, physiol. 3 cred.)
171. Child Nutrition. Lectures and discussions dealing with the principles of child nutrition and with the formation of desirable food habits. Observation of children at mealtime is included. (3 cred.; jr., sr.; prereq. 170, H.E.Ed. 90)
173. Nutrition in Disease. 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, Ag.Bi. 2)
177. Digestion and Metabolism. Selected problems relating to digestion and metabolism involving lectures, readings, and laboratory work. (3 cred.; jr., sr.; prereq. 35)
178. Clinical Problems in Nutrition. 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. Gives experience in use of nutrition books and periodicals, involving readings, oral and written reports. (2 cred.; jr., sr.; prereq. 170)
180. Home Planning and Furnishing. Problems in planning and furnishing a home to meet family needs. Esthetic, economic, social, and managerial aspects are considered. Each student develops a plan for a house and its furnishings based on family living. Field trips. (5 cred.; jr., sr.; prereq. 27, 49, 120 advised. Not open to students who have had G.C. 16, F.L. 15, H.E. 24, or H.E. 57)
181. Housing Problems of the Family. Plans for both urban and rural homes with evaluation of the economic, art, and social aspects. Discussions, field trips, and classroom analyses. (3 cred.; jr., sr., grad.; prereq. 24 or 27)
185. Family Relationships. Factors that promote satisfaction in family living, and inter-relationships of the family and the community. (3 cred.; jr., sr., grad.; prereq. 17, 86, H.E.Ed. 90, or cons. of instr.)
186. Problems in Income Management. Specific aspects of financial management for the individual and for the family. Readings, discussions, and field work. (3 cred.; jr., sr., grad.; prereq. 85, 86, 34 or equiv., or cons. of instr.)

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 followed by a discussion of the problems of training small children. Emphasis 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. A study of philosophy basic to the home economics program; students' needs and interests; books, bulletins and illustrative materials for instruction purposes; curriculum guides and unit construction; development of home economics in the school program. (5 cred.; jr., sr.; prereq. H.E. 4, 21, 22, 41; Ed. 55A-B; parallel H.E.Ed. 93; home experience. Plans for the home experience prerequisite for H.E. 91 and 93 should be made with the adviser in H.E.Ed.)
92. Teaching Problems in Home Economics. Teaching procedures; management of the home-making department, space and equipment; relationship of teacher to a school, community, and the profession. (2 cred.; sr.; prereq. 91, 93; parallel with 94, 192, 194A)
- 93-94. Supervised Teaching in Home Economics. Observation, participation, and actual experience under supervision in different home economics situations and on different age levels. In the second quarter the student spends a month in a selected school in the state. (9 cred.; jr., sr.; prereq. H.E. 4, 21, 22, 41, Ed. 55A-B. Student must have completed home experience work in home economics. Plans for the home experience prerequisite should be made with the adviser in H.E.Ed.) (Students must sign up in the Office of Admissions and Records, St. Paul Campus, at least 2 qtrs. prior to reg. in this course)
95. Field Experience for Home Agents. Observation, participation, and actual experience under supervision in the agricultural extension program. Includes study of program on St. Paul Campus and participation in a selected county program with a home agent. Written report summarizing the experience is required. (6 cred.; prereq. 91, 93; cons. of head of H.E.Ed. and director of Agricultural Extension is required for registration)
192. Evaluation in Home Economics. Evaluation as a means of measuring progress toward important goals in different areas of home economics; studies of available tests and other evaluation materials; construction and refinement of various evaluation instruments. Study of elementary statistical techniques useful to home economics teachers. (2 or 3 cred.; sr., grad.; prereq. 91, 93, Ed. 55A-B)
- 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. 94 or cons. of instr.)
- 193B. Home Economics Curriculum. (College level) The place of home economics in higher education; problems facing home economics in small colleges; curriculum offerings; teaching schedules and load; appropriate reference materials. (3 cred.; sr., grad.; prereq. cons. of instr.)
- 194A. Adult Education in Home Economics. Objectives of adult education in homemaking; study of problems affecting community and family life; methods and techniques used in helping adults and out-of-school youth to solve problems in home living. Course is planned for teachers, extension workers, and other workers in adult education in homemaking. (3 cred.; sr., grad.; prereq. 91, 93)
- 194B. Adult Education in Home Economics. Planning a community program; teaching procedures; special problems. Course is planned for teachers and supervisors of adult classes. (3 cred.; sr., grad.; prereq. 91, 93, 194A)
195. Space, Equipment, Furnishings and Materials for Home Economics Departments. A study of remodeling old and planning new departments, and equipping and furnishing them. Review of research studies. Investigation of special problems. Designed primarily for graduate students and adult specials, but will be open to seniors by permission of instructor. (3 cred.; sr., grad.; prereq. 91, 93, H.E. 49)

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 plan to enter 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 to take 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:

- a. Vegetable Growing: Hort. 32, 110, 135, 136, 138, 139; Agro. 31
- b. Fruit Growing: Hort. 6, 36, 40, 107, 110, 111, 121; Agro. 31
- c. Landscape Gardening: Hort. 6, 10, 21, 22, 36, 40, 51, 60, 61, 62, 63, 64; Ag.En. 3, 19, 31; Bot. 10, 50; Geol. 8; Art 1, 10, 20, 21; Draw. 44; Pl.Pa. 1 or 10
- d. Floriculture: Hort. 16, 21, 22, 36, 51, 52, 54, 110; Agro. 31; Pl.Pa. 1 or 10

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.

It is recommended that students in Landscape Gardening extend their program into the fifth year. Two spring quarters should be used to gain practical experience on landscape nurseries. This will satisfy the farm experience requirement.

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

Freshman and Sophomore Courses

1. General Horticulture. A study of fruit, vegetable, and ornamental plants, including factors which influence their culture, value, and importance in Minnesota. Lect. (3 cred.; no prereq.)
6. 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. Lect. and references. (3 cred.; no prereq.)
10. Home Floriculture. Designed for the student who does not take any other courses in floriculture. Gives working knowledge of the propagation, culture, and uses of the common garden flowers and house plants. Lect., lab., and reference reading. (3 cred.; no prereq.)
16. Greenhouse Management. The fundamentals of greenhouse construction and management, soils, fertilizers, watering, ventilating, heating, lighting, shading. (3 cred.; 6 cred. in bot. or equiv.)
21. Plant Materials, Fall and Winter Aspects. A study of the trees, shrubs, and evergreens used in landscape planting, with emphasis on their fall and winter characters, their identification and uses in landscape design. Lect., lab. (outdoor and indoor), and field trips. (3 cred.; prereq. 6 cred. in bot. or equiv.)
22. Plant Materials, Spring and Summer Aspects. A study of trees, shrubs, and evergreens used in landscape planting, with emphasis on their spring and summer characters, particularly that of blooming habit. Lect., lab. (outdoor and indoor), and field trips. (3 cred.; prereq. 6 cred. in bot. or equiv.)
32. Vegetable Growing. 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. 6 cred. in bot.)
36. Plant Propagation. Methods of propagating plants by seed, cuttings, layers, divisions and grafting. Practical work in management of nursery stock, bulbs, and plants. Lect., reference reading, and field trips. (3 cred.; jr., sr.; prereq. 6 cred. in bot. or equiv.)
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 cons. of instr.)

Junior and Senior Courses

51. Garden Flowers. The common annuals, biennials, and perennial flowers, with emphasis on their uses in landscape planting. Lect., lab., reference reading, and field trips. (3 cred.; jr., sr.; prereq. 9 cred. in bot. or equiv., cons. of instr.) (Offered in 1951-52 and alternate years)
52. Commercial Floriculture, Fall Crops. The culture of the principal florist crops and tropical plants of economic importance. Major emphasis on chrysanthemums, carnations, cut flowers, and potted plants especially adapted to Christmas sales. Lect., reference reading, and field trips to greenhouses, wholesalers, and retail flower stores. (3 cred.; prereq. 16 and 6 cred. in bot. or equiv.)
54. Commercial Floriculture, Spring Crops. Principal florist crops and tropical plants of economic importance. Major emphasis on orchids, roses, bulbous plants, and material adapted to spring sales. Lect., reference reading, and field trips to greenhouses, wholesalers, and retail flower stores. (3 cred.; prereq. 16 and 6 cred. in bot. or equiv.)
60. Principles of Landscape Design. (Formerly Course 24) Principles of landscape design with special reference to their practical application in planning of residential landscapes. Relationships of landscape design, architectural design, and interior decoration. Landscape plans, landscape drafting techniques, and methods of presentation. Lect., drawings, and practical problems. (3 cred.; prereq. 21, 22, or cons. of instr.)
61. Principles of Planting Composition. (Formerly Course 25) 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. Lect. and problems. (3 cred.; prereq. 60 or cons. of instr.)
- 62, 63, 64. Special Problems in Landscape Design and Composition. Problems based upon the work given in the preceding landscape gardening courses. (2 to 4 cred. per qtr.; sr.; prereq. 61)
76. Landscape Construction and Maintenance. 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. Lect., field trips, reports, and construction problems. (3 cred.; jr., sr., grad.; prereq. 60 or 61 or cons. of instr.) (Offered in 1952-53 and alternate years)
107. Orchard Management. Detailed study of the various operations in orchards and berry fields. Operating costs and profits. Lect., lab., and individual problems. (3 cred.; jr., sr., grad.; prereq. 6. Limited to major or minor students in hort. or cons. of instr.) (Offered in 1952-53 and alternate years)
110. Horticultural Crop Breeding. Principles of plant improvement, their special application to horticultural plants, and the breeding methods used with vegetables, fruits, and ornamentals. (3 cred.; jr., sr., grad.; prereq. Agro. 31)
111. Systematic Pomology. Fruit varieties. Classification, description, identification, and elements of judging. Lect., lab., and a survey of the literature. (3 cred.; jr., sr., grad.; prereq. 6. and 9 cred. in bot. or equiv. Limited to major or minor students in hort. or cons. of instr.) (Offered in 1951-52 and alternate years)
121. Small Fruit Culture. Cultural practices for each of the small fruits. Brief consideration of their botanical relationships and the history of their commercial development. Lect., problems, and survey of literature. (3 cred.; jr., sr.; prereq. 6 or 32, 9 cred. in bot. or equiv. Limited to major or minor students in hort. or cons. of instr.)
135. Potatoes. Culture, handling, storage, seed maintenance, varieties, improvement, and physiology of the potato plant. (3 cred.; jr., sr.; prereq. 32, 9 cred. in bot. or equiv.)
136. Adaptation and Maintenance of Vegetable Varieties. Origin and development of leading varieties and their adaptation to different vegetable-producing areas. Methods of seed production and maintaining of varieties. Activities of plant breeding organizations. (3 cred.; jr., sr., grad.; prereq. 32, 9 cred. in bot. or equiv.) (Offered in 1951-52 and alternate years)

138. Vegetable Crops I. Lectures and assigned reading on the relation of light, temperature, moisture, nutrients, and other factors to the growth and culture of vegetable crops. (3 cred.; jr., sr., grad.; prereq. 32, 9 cred. in bot. or equiv.) (Offered in 1952-53 and alternate years)
139. Vegetable Crops II. A continuation of Course 138. (3 cred.; jr., sr., grad.; prereq. 32, 9 cred. in bot. or equiv.) (Offered in 1951-52 and alternate years)
150. Principles of Quality Control. Factors influencing the texture, flavor, and quality of fruits and vegetables after harvest. Study of objective methods for determining texture and maturity. Quality control equipment and methods used in commercial processing operations and for fresh market outlets. Pre-packaging materials and methods. (2 cred.; jr., sr., grad. Limited to major or minor students in hort. or food tech., or cons. of instr.)
- 190-191-192. Special Problems. Problems based upon the work given in the preceding courses. (2 to 4 cred. per qtr.; jr., sr., grad.; prereq. cons. of instr.)
- 193-194. Horticultural Seminar. Reports and discussions of problems and investigational work. (1 cred. per qtr.; sr., grad.; prereq. 9 cred. in hort.)

ORIENTATION

1. College Orientation Lectures. Required of all students entering the college except those who have had one year or more of work in another college. Students must register for course in their first quarter in college. Discusses Land-Grant institution development and program of the college. Gives limited attention to principles of learning and individual differences, study habits and skills. Outlines student personnel program of college and university. (1 cred.)

PLANT PATHOLOGY AND BOTANY

Training in this field may lead to state and federal 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 the approval of the division.

Recommended for major in plant pathology:

1. **Science Specialization**—Pl.Pa. 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 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 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 Technical Agriculture and Science Specialization Curricula, consult divisional adviser.

Plant Pathology

Freshman and Sophomore Courses

1. Plant Pathology. An introductory course in plant diseases. Lect., lab., and special problems. (5 cred.; soph., jr., sr.; not open to those who have completed Course 10; prereq 9 cred. in plant sciences with at least 6 cred. in bot.)
10. Forest Pathology. Diseases of forest and shade trees, and the rotting of timber. Symptoms, etiology, and control. Lect., lab., and reference work. (5 cred.; soph., jr., sr.; not open to those who have completed Course 1; prereq. 6 cred. in bot.)

Junior and Senior Courses

52. Biochemistry and Microbiology of Cereal Grains. (Same as Ag.Bi. 52) Physical properties and chemical composition of cereal grains and their mill products; microorganisms associated with cereal grains and their products; the biochemistry and microbiology of grain storage, milling, malt production, and breadmaking. (3 cred.; jr., sr.; open only to students in Mechanical Engineering Curriculum (Milling Option); prereq. 5 cred. in elem. org. chem., and 9 cred. in general biol. or equiv.)
56. Introduction to the Study of Fungi. Structure, development, and identification of fungi, especially those of economic importance. (3 cred.; jr., sr.; prereq. 9 cred. in bot. or cons. of instr.)
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. Lect., lab., and field work. (3 or 5 cred. per qtr.; jr., sr., grad.; prereq. 1 or 10 or equiv.)
111. Diseases of Field Crops. Detailed study of diseases of field crops including symptomatology, etiology, and practical methods of control. (4 cred.; jr., sr., grad.; 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. Lect., lab., and field work. (3 cred.; jr., sr., grad.; prereq. 1 or 10) (Given in alternate years; not offered in 1951-52)
113. Fungi. A study of representative fungi in the principal taxonomic groups, with special emphasis upon morphology, physiology and taxonomy. (4 cred.; jr., sr., grad.; prereq. 10 cred. in biol., 10 cred. in chem., Bact. 53) (Same as Bact. 113)
114. Advanced Forest Pathology. A detailed study of wood rots, including a study of the deterioration of wood products caused by fungi. Lect. and lab. (3 cred.; jr., sr., grad.; prereq. 1 or 10)
117. Virus Diseases of Plants. Nature of plant viruses and types of diseases they cause; emphasis on methods for studying virus diseases. (3 cred.; jr., sr., grad.; prereq. 1 or 10) (Given in alternate years; not offered in 1952-53)
118. Bacterial Diseases of Plants. Bacteria as plant pathogens; representative types with particular reference to techniques used in studying bacterial diseases of plants. (3 cred.; jr., sr., grad.; prereq. 1 or 10) (Given in alternate years; not offered in 1951-52)
119. Principles of Plant Disease Control. A general consideration of principles and practices in controlling plant diseases. (3 cred.; jr., sr., grad.; prereq. 1 or 10)
- 141-142. Insects in Relation to Plant Disease. (Same as Ent. 141-142) 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., grad.; prereq. 8 cred. in ent. or pl. pa.)
143. Methods. Theoretical and practical consideration of methods used in pathological and mycological research. (3 cred.; jr., sr., grad.; prereq. 1 or 10)
156. Advanced Study of Fungi. General characters of fungi, especially those used in identification; cultural and taxonomic procedures and practices. (3 cred.; jr., sr., grad.; prereq. 9 cred. in bot. or cons. of instr.; not open to those who have had 56)

*Agricultural Botany and Applied Plant Physiology**Freshman and Sophomore Courses*

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. 6 cred. in bot.)
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. 9 cred. in bot. 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. 9 cred. in bot. or equiv.)

Junior and Senior Courses

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.)
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., grad.; prereq. 9 cred. in bot. 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., grad.; prereq. 15 cred. in plant sciences or cons. of instr.)
103. Physiology of Crop Plants. A study of physiological factors affecting the growth and development of crop plants. Lect. and lab. (3 or 5 cred.; jr., sr., grad.; prereq. 15 cred. in plant sciences or cons. of instr.)
135. Weed Control. (Same as Agro. 135) Cultural and chemical methods of weed control; weed and seed laws pertaining to dissemination and control. Lect., lab., and field work. (3 cred.; jr., sr., grad.; prereq. 3 and Agro. 1)
160. Plant Histochemistry. A study of the identification and function of plant constituents, with special consideration given to economic plants. Lect. and lab. (3 cred.; jr., sr., grad.; prereq. 15 cred. in plant sciences or cons. of instr.)
161. Technology of Fruits and Vegetables. A study of the methods used in transporting, storing, and ripening fruits and vegetables. Lect. and lab. (3 cred.; jr., sr., grad.; prereq. 15 cred. in plant sciences or cons. of instr.) (Given in alternate years; offered in 1951-52)
162. Temperature Relations of Crop Plants. A study of general temperature effects, with special emphasis on low temperatures and the prevention of low temperature injury. Lect. and lab. (3 cred.; jr., sr., grad.; prereq. 15 cred. in plant sciences or cons. of instr.)
163. Practical Applications of Plant Physiology. A study of the applications of plant physiological principles to agriculture, horticulture, and forestry. Lect. and lab. (3 cred.; jr., sr., grad.; prereq. 15 cred. in plant sciences or cons. of instr.)

POULTRY HUSBANDRY

Students whose major interests lie in the fields of poultry production, processing, and distribution, and in education should follow the curriculum in technical agriculture. Those interested in research or postgraduate work should follow a specified curriculum in science specialization. Vocational opportunities appear in such areas as (1) private business, (2) extension, teaching and research in state colleges and experiment stations and the federal government, (3) supervisory and regulatory work, and (4) service work or research in industry.

Recommended courses for majors in:

1. **Technical Agriculture**—Po.Hu. 1, 51, 52, 102, 104, 153, 154; An.Hu. 112; Vet. 109; Ag.Bi. 6; Ag.Ec. 25, 40; Agro. 31.
2. **Science Specialization**—Consult adviser.

Freshman and Sophomore Courses

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

Junior and Senior Courses

51. Hatchery Management. Principles of incubation, study of commercial incubators and factors affecting hatchability; practice in chick, poult and goose sexing; problems in hatchery operation. (3 cred.; jr., sr.; prereq. 1, Zool. 14-15)
52. Poultry Selection. Practice in selection for standard and production qualities of poultry. (3 cred.; jr., sr.; prereq. 1)
55. Special Problems. Special individual assignments in poultry husbandry. (1-3 cred.; jr., sr.; prereq. 6 cred. in po. hu.)
102. Poultry Breeding. Application of the principles of genetics and physiology of reproduction to the breeding of poultry. (4 cred.; jr., sr., grad.; prereq. 1, Agro. 31)

104. Seminar. A study of current problems and developments in the poultry industry. (1 cred.; jr., sr., grad.; prereq. 6 cred. in po. hu.)
153. Poultry Nutrition and Feeding. A study of the nutrients required by poultry and how these nutrients are supplied under practical feeding conditions. Feeding methods and ration formulation are considered. (3 cred.; jr., sr., grad.; prereq. 1, Ag.Bi. 1)
154. Poultry Products. A study of grades and classes of market poultry and eggs and methods of processing and storage. (3 cred.; jr., sr., grad.; prereq. 1)

RHETORIC

All freshmen must satisfy certain requirements in the four communication skills, and should report to Green Hall Auditorium the first period each day for the first week of every quarter. After a week of diagnosis they will be sectioned according to their needs and abilities. All sections will then continue to meet during the first period, but for only three days a week.

Students with a good scholastic record in their freshman communications courses or freshman English courses taken elsewhere are eligible to try the Rhetoric 51 exemption examination.

Freshman and Sophomore Courses

1. Communications I. Diagnostic tests in listening, reading, speaking, and writing. Sectioning and specialized training according to individual needs. Core assignments integrating the use of all four skills. Progress tests. Re-examination to determine what further training in communication is needed for attainment of the level of proficiency required of our college freshmen. (3 cred.; no prereq.)
2. Communications II. Expository communication. Balanced training in adapting the four communication skills to the presentation and assimilation of oral and written materials of expository nature. Note-taking, outlining, written papers, oral reports. (3 cred.; prereq. placement test)
3. Communications III. Persuasive communication. Balanced training in adapting the four communication skills to the presentation and critical analysis of oral and written materials of a persuasive nature. Argument, evidence, and documentation. Brief-writing and persuasive speaking. (3 cred.; prereq. placement test)
12. Debate and Discussion. Classroom and intercollegiate debating; briefing, methods of public discussion, the elements of persuasion. (3 cred.; soph., jr., sr.; prereq. Rhet. Comm. req.)
22. Public Speaking. A practical course in the fundamentals of speech making. Emphasis upon organizing the speech and projecting it to the audience. (3 cred.; soph., jr., sr.; prereq. Rhet. Comm. req.)
26. Original Writing. Intended for students interested in writing popular articles or creative materials including the essay, the short story, poetry, the one-act play. (3 cred.; soph., jr., sr.; prereq. Rhet. Comm. req.)
28. Play Production. History of the theater, theories of acting, staging, etc. Survey of the problems confronting the producer of amateur plays. (3 cred.; soph., jr., sr.; prereq. Rhet. Comm. req.)
31. English Literature I. Introduction to poetry and drama, stressing comprehension and appreciation of literature. Records and visual aids supplement lecture and discussion. (5 cred.; soph., jr., sr.; prereq. Rhet. Comm. req.)
32. English Literature II. Introduction to essay, biography, and fiction. Continuation of Rhet. 31 but may be taken independently. Records and visual aids supplement lecture and discussion. (3 cred.; soph., jr., sr.; prereq. Rhet. Comm. req.)
33. American Life in American Literature. A careful examination of the works and influence of ten pre-eminent contributors to our national literature. (3 cred.; soph., jr., sr.; prereq. Rhet. Comm. req.)
47. Efficient Reading. Designed to increase reading rate, comprehension, and vocabulary. Open to all students, including graduate students, who score above the 30th percentile rank on a standard test. (Minneapolis Campus students, see Student Counseling Bureau.) For persons of average or above average reading ability who wish to achieve or maintain superior scholastic status. Not a remedial course. (3 cred.; no prereq.)

Junior and Senior Courses

51. Exposition. Essays; semitechnical and technical articles; application letter. Review of usage and study of style. Required of all students unless exempted through examination given by department. (3 cred.; jr., sr.; prereq. Rhet. Comm. req.)
54. Advanced Public Speaking. Training for specific speech situations most likely to be encountered professionally soon after graduation. Aids in informative speaking. Psychology of persuasion. (3 cred.; jr., sr.; prereq. 22)
59. Advanced Play Production. Continuation of Rhet. 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 cons. of instr.)
60. Contemporary Literature. Reading and analysis of important books of the current period. (3 cred.; jr., sr.; prereq. Rhet. Comm. req.)
91. American Speech for Foreign Students. Primarily for graduate students who wish to improve their command of oral English. Individual attention; laboratory procedure. Audio-visual equipment used to expedite work in vocabulary, enunciation, and pronunciation. First class session held the first Wednesday of each quarter at 3:00 p.m., Room 311, Agricultural Engineering. Subsequent sessions arranged to suit convenience of students. (No cred.; 2 hrs. per week; no prereq.)

SOILS

Soils majors in either Technical Agriculture or Science Specialization are expected to take Courses 5, 103, 108, and 111. 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 take Course 109 and 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. In.Ch. 1-2 or 4-5)
5. Soil Management. Nutrient requirements of crops; fertilizers and fertilizer materials; fertilizer practices; use of lime; farm manures, composition, value, and use; green manuring; soil management and fertility maintenance. (3 cred.; soph., jr., sr.; prereq. 4)

Junior and Senior Courses

52. Production and Grading of Cereal Crops. (Same as Agro. 52) Production, harvesting, and grading of cereal crops including soil management practices and fertilizers, selection of varieties and cultural methods; factors affecting quality and methods of harvesting; laboratory practice in grading small grains. (4 cred.; jr., sr.; open only to students registered in the Mechanical Engineering Curriculum (Milling Option); prereq. 9 cred. in general biol. or equiv.) (Offered in alternate years; not offered in 1951-52)
103. Principles of Soil Erosion. Causes and forms of erosion; relation of erosion to climate, vegetation, slope, soil type, and soil management. Control practices. Organizations dealing with soil erosion. (3 cred.; jr., sr., grad.; prereq. 4)
104. Soil Mapping. Practice in the identification and mapping of soil types; preparation of soil maps and gathering of field data. (3 cred.; jr., sr., grad.; prereq. 108, 109)
108. Physical Properties of Soils. Determination of physical constants of soils, including mechanical composition. Lect. and lab. (3 cred., jr., sr., grad.; prereq. 4)

109. Soil Genesis and Classification. Genesis, nature, and distribution of the soil types of Minnesota; development of soils as influenced by climatic, topographic, geologic, and vegetative factors and their classification. (3 cred.; jr., sr., grad.; prereq. 4, 108)
110. Chemistry of the Soil. The chemistry of soil mineral matter, organic matter, ionic exchange in soils. Soil nutrient elements and the factors affecting their availability. (3 cred.; jr., sr., grad.; prereq. 4)
111. Field and Laboratory Studies of Soils. Soil maps; soil texture, structure, and color; soil reaction; nutrient deficiencies; lime and fertilizer materials; fertilizer plot techniques and interpretation of data. Erosion control practices. Lect., lab., and field. (3 cred.; jr., sr., grad.; prereq. 4)

VETERINARY MEDICINE

For information about the School of Veterinary Medicine, see Section II of this bulletin and consult with advisers in veterinary medicine.

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.)
- 101-102-103. Animal Anatomy. Gross anatomy of domestic animals. (7 cred. for 101, 5 cred. for 102, 4 cred. for 103; open only to first yr. vet. and to grad. with cons. of instr. Enrolment limited)
104. Special Studies in Animal Anatomy. Individual problems for further study in animal anatomy. (1-3 cred. per qtr.; registration for more than one qtr. permitted; prereq. 101)
106. Veterinary Surgical Anatomy. Topographical anatomy of the domestic animals as applied to surgery and the practice of veterinary medicine. (1 cred.; third yr. vet. med. and grad. with cons. of instr.; prereq. 103, 170)
107. Animal Gross and Microscopic Anatomy. A general systematic presentation of the microscopic and gross anatomy of the animal's body emphasizing in particular the digestive, blood, vascular, and respiratory systems. (5 cred.; jr., sr., grad.; prereq. Zool. 14-15 or cons. of instr.)
108. Special Animal Gross and Microscopic Anatomy. Detailed study of individual species selected by student with consent of instructor. Emphasis placed on the study of the nervous, digestive, and reproductive systems. (3 cred.; jr., sr., grad.; prereq. 107)
109. Anatomy, Physiology, and Hygiene of Poultry. The general anatomy of the fowl, the physiology of digestion and reproduction, and prevention and control of the more important diseases affecting chickens and turkeys. (3 cred.; jr., sr.; prereq. Zool. 14-15, Po.Hu. 1)
- 111-112-113. Animal Histology and Embryology. Microscopic studies of the various tissues and organs, including embryology, of the domestic animals. (6 cred. for 111, 5 cred. for 112, 4 cred. for 113; open to first yr. vet. and to grad. with cons. of instr. Enrolment limited)
114. Special Studies in Animal Histology and Embryology. Individual problems for further study in animal histology and embryology and histological techniques. (1-3 cred. per qtr.; registration for more than one qtr. permitted; prereq. 111 or equiv.)
119. Seminar in Animal Anatomy. (1 cred.; jr., sr., grad.; prereq. 101, 111, or cons. of instr.)
- 121-122-123. Animal Bacteriology. Morphology, classification, and characteristics of pathogenic bacteria. Principles of infection and immunity and studies of bacteria, viruses, yeasts, molds, and actinomycetes associated with animal diseases. Open to vet. med. and to grad. with cons. of instr. Limited enrolment. (5 cred. for 121, 6 cred. for 122, and 4 cred. for 123; jr., sr., grad. with cons. of instr.; prereq. 10 cred. in zool., 13 cred. in chem.)
125. Poultry Diseases. Lectures dealing with the diseases of poultry. (3 cred.; fourth yr. vet. med. and grad. with cons. of instr.; prereq. 123, 153, and 162)

126. Dairy Hygiene. Study of the effect of bovine diseases and sanitation on the quality and safety of milk and milk products. (4 cred.; fourth yr. vet. med. and grad. with cons. of instr.; prereq. 123 and 179)
127. Veterinary Public Health. Study of the functions of veterinary public agencies and of epidemiologic methods in the study of animal diseases. (2 cred.; fourth yr. vet. med. and grad. with cons. of instr.; prereq. 123 and 179)
- 135-136. Animal Physiology. The physiology of circulation, respiration, digestion, kidney function, endocrine function, reproduction, nervous system, and special senses in the domestic animals. Open to vet. med. and to grad. students with cons. of instr. Limited enrolment. (8 cred. for 135, 7 cred. for 136; sr., grad. with cons. of instr.; prereq. 103, 113, and Physiol.Chem. 103, or cons. of instr.)
137. Problems in Animal Physiology. (Cred. ar.; jr., sr., grad.; prereq. 135 and 136 or Hum.Physiol. 106 and 107)
140. Seminar in Animal Physiology. (2 cred.; jr., sr., grad.; prereq. 136 or cons. of instr.)
143. Veterinary Clinical Pharmacology. Continuation of general pharmacology with emphasis on the clinical aspects in domestic animals. (3 cred.; third yr. vet. med. and grad. with cons. of instr.; prereq. Pharmacol. 105)
- 151-152-153. Animal Pathology. Descriptions, discussions, and gross and microscopic demonstrations of tissue reactions, including retrogressive and inflammatory changes, neoplasms, and reparative processes. (4 cred. for 151, 5 cred. for 152, and 6 cred. for 153; sr., grad.; prereq. 103, 113, and 135 or equiv. with cons. of instr.)
154. Veterinary Clinical Pathology. Application and interpretation of laboratory tests used in clinical diagnosis in domestic animals. (2 cred.; third yr. vet. med. and grad. with cons. of instr.; prereq. 152)
155. Meat Hygiene. Lectures and discussions of meat inspection procedures and regulations with considerations given to the various infections, degenerative and disease processes affecting meat. The laboratory work consists of trips to local packing plants to observe details of ante-mortem and post-mortem inspection procedures. (3 cred.; fourth yr. vet. med.; prereq. 153)
157. Veterinary Post-mortem Pathology. Autopsies, techniques, examinations of tissue sections, preparation of records and diagnosis. (1-3 cred. per qtr.; jr., sr., and grad.; prereq. 153 and cons. of instr.)
158. Veterinary Surgical Pathology. Study of neoplasms, surgical biopsies, post-mortem material together with a review of the pertinent literature. (1-3 cred.; jr., sr., and grad.; prereq. 153 and cons. of instr.)
161. Animal Parasitology. A systematic and biological study of the protozoan and arthropod parasites of animals. Emphasis is placed on their relationships to disease and the principles of parasite control. (4 cred.; sr., grad.; prereq. 103, 113 or equiv. with cons. of instr.)
162. Animal Parasitology. Study of the helminth parasites and parasitic diseases of animals with emphasis on principles of control. (6 cred.; sr., grad.; prereq. 161)
168. Diseases of Fur-Bearing Animals. Etiology, symptomatology and treatment of diseases of fur-bearing animals. (2 cred.; fourth yr. vet. med. and grad. with cons. of instr.; prereq. 123 and 186)
169. Veterinary Jurisprudence and Business Methods. Required course given to fourth year veterinary medical students designed to acquaint the student with the fundamentals of the legal responsibilities of a veterinarian, public relations, jurisprudence, veterinary ethics, and regulatory procedures. (2 cred.; fourth yr. vet. med.; prereq. successful completion of the third yr. of vet. med.)
170. Veterinary Clinical Diagnosis. Procedures of physical diagnosis and restraint of animals. (3 cred.; sr.; prereq. 136, 151)
- 171a-171b-171c (third year vet. med.);* 171d-171e-171f (fourth year vet. med.)*
Clinical Conferences. Group discussion of clinical cases. (1 cred. per qtr.; third and fourth yr. vet. med. and grad. with cons. of instr.; prereq. 170)

* To receive credit for any part of each of these two courses the f-w-s sequence must be completed.

- 172. Animal Surgery. Anesthesia, asepsis, hemostasis, preoperative and post-operative care and surgical techniques. (6 cred.; third yr. vet. med. and grad. with cons. of instr.; prereq. 170)
- 173. Special Animal Surgery. Operative practices, and etiology, diagnosis, and surgical diseases of large animals. (5 cred.; third yr. vet. med. and grad. with cons. of instr.; prereq. 172)
- 174. Advanced Animal Surgery. Continuation of 173 in operative practices and procedures requiring more skilled techniques. (3 cred.; third yr. vet. med. and grad. with cons. of instr.; prereq. 173)
- 177, 178, 179. Large Animal Medicine. A study of the diseases of large animals. (5 cred. per qtr.; third yr. vet. med. and grad. with cons. of instr.; prereq. 170)
- 180, 181. Infectious Diseases of Domestic Animals. Lectures and discussions of the diagnosis, treatment and control of diseases of domestic animals caused by infectious agents. (5 cred. per qtr.; fourth yr. vet. med. and grad. with cons. of instr.; prereq. 179)
- 185. Small Animal Medicine. Study of the medical and surgical diseases of small animals. (4 cred.; third yr. vet. med. and grad. with cons. of instr.; prereq. 178)
- 186. Small Animal Medicine. Continuation of Course 185. (4 cred.; fourth yr. vet. med. and grad. with cons. of instr.; prereq. 165)
- 188, 189, 190. Clinical and Laboratory Practice. Medical, obstetrical, surgical, ambulatory clinics and post-mortem examinations, in diseases of animals. (5 cred. per qtr.; third yr. vet. med.; prereq. 170)
- 191, 192, 193. Clinical and Laboratory Practice. Medical, obstetrical, surgical, and ambulatory clinics for diseases of animals, for fourth year veterinary medical students. (5 cred. per qtr.; fourth yr. vet. med. and grad. with cons. of instr.; prereq. 190)
- 194, 195. Veterinary Obstetrics and Problems of Animal Reproduction. Lectures and laboratory studies covering for the domestic animals the anatomical and physiological factors of reproduction, diseases of the newborn, obstetrical and sterility problems, and artificial insemination. (3 cred. for 194 and 5 cred. for 195; third and fourth yr. vet. med. and grad. with cons. of instr.; prereq. 190)
- 196. Veterinary Radiology. Preparation and interpretation of radiographs and fluoroscopic examinations in veterinary medicine, consideration of radiant energy as a therapeutic agent and discussion of protective measures against radiation hazards. (3 cred.; fourth yr. vet. med. and grad. with cons. of instr.; prereq. 190)
- 197. Animal Diseases and Poisonous Plants. Systematic study of important plants poisonous to animals. Special emphasis is placed on identification, toxicology, diagnosis and treatment. (3 cred.; fourth yr. vet. med. and grad. with cons. of instr.; prereq. 143, 170, 179, 188)

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* See University of Minnesota *Bulletin of General Information*.