University of Minnesota Bulletin

MAY 31, 1972

college of forestry

UNIVERSITY OF MINNESOTA

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PROGRAMS AND COURSES IN

College of Forestry

FOREST RESOURCES DEVELOPMENT CURRICULUM

with related areas in . . .

- Biology
- Ecology and Silviculture
- Economics and Policy
- Hydrology
- Management and Administration
- Measurement and Quantitative Analysis
- Range and Wildlife
- Recreation
- Urban Forestry
- Wood and Fiber Products

FOREST SCIENCE CURRICULUM

with specializations in . .

- Natural Science
- Social Science

FOREST PRODUCTS CURRICULUM

with specializations in . . .

- Manufactured Housing
- Marketing
- Pulp and Paper
- Wood Science and Technology

RECREATION RESOURCE MANAGEMENT CURRICULUM

An Interdisciplinary Program

UNIVERSITY OF MINNESOTA

HOW TO USE THIS BULLETIN

This bulletin is the basic source of information on the College of Forestry. You should keep it at hand for ready reference. The Index in the back of the bulletin will refer you to information on specific points.

Section 1 describes the objectives or goals and facilities of the College of Forestry.

Section 2 outlines the information on General Academic Requirements, such as degrees offered, admission requirements, registration and class attendance, scholarship requirements, classification of students, the Council on Liberal Education requirements, and junior-senior requirements.

Section 3 presents the programs and curricula in forestry.

Section 4 describes the courses offered.

Section 5 contains general information on student personnel services, student government, ROTC programs, and scholarships and awards.

Section 6 lists the departments offering primary courses related to College of Forestry programs.

In addition to this bulletin, 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 offered during the quarter, with time and place of class meetings.

Explanation of Symbols and Course Numbers

Courses primarily for freshmen and sophomores are numbered 1-000 through 1-998; for juniors and seniors, 3-000 through 3-998; for juniors, seniors, and graduate students, 5-000 through 5-998. Courses numbered 8-000 and above are restricted to students registered in the Graduate School.

The following standard symbols are used throughout the course description section in lieu of page footnotes.

* Graduate students may prepare Plan B papers.

† To receive credit, all courses listed before the single dagger must be completed.

‡ Students may enter sequence course in any quarter which precedes the double dagger.

§ No credit is granted if credit was received for equivalent course listed after section mark.

¶ Concurrent registration is allowed with the course listed after paragraph mark.

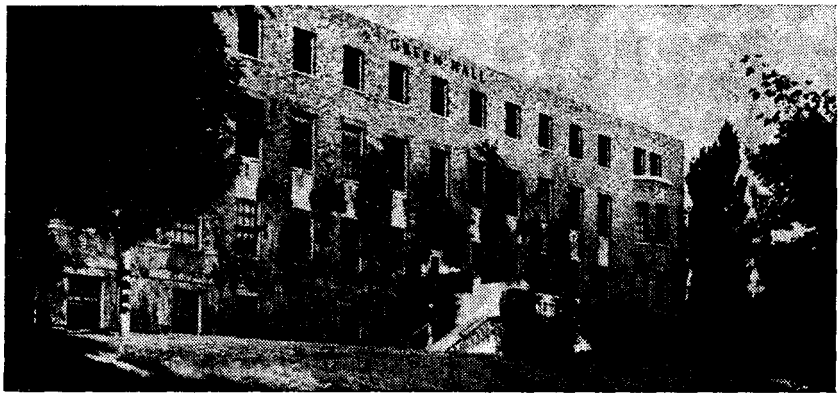
‡ Consent of instructor is required.

△ Consent of department or school offering course is required.

x After a course number indicates course is offered more than 1 quarter.

When no abbreviated departmental prefix precedes the course number listed as a prerequisite, that prerequisite is in the same department as the course being described. A prerequisite reading "6 cr" means 6 credits in courses offered by the "same" department.

FACILITIES OF THE COLLEGE OF FORESTRY



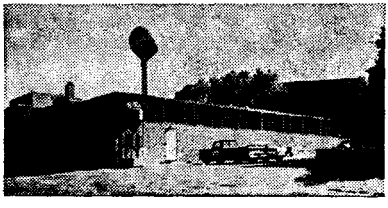
Green Hall

The College of Forestry is located on the St. Paul Campus and consists of two modern buildings—Green Hall and the Forest Products Building. Green Hall is the headquarters for the College of Forestry. Students registered in the Forest Products curricula will take their professional courses in the Forest Products Building.

The college also has two outstanding field stations for education and research. Forest Resources Development and Forest Science majors spend 3½ weeks of the summer between their sophomore and junior years at the Itasca Forestry and Biological Station located in Itasca State Park. The entire fall quarter or spring quarter of the senior year for Forest Resources Development students is spent at the Cloquet Forestry Center located at Cloquet, Minnesota.

Forest Products Building

Cloquet Forestry Center



Forest Products Laboratory

Itasca Forestry and Biological Station

College of Forestry

SECTION 1

INTRODUCTION

The Educational Objectives of the College of Forestry

The goals or objectives of the undergraduate educational program of the College of Forestry are:

1. Development of professional competence in the area or curriculum of a student's choice, with opportunity to broaden programs through related areas or specializations.
2. Preparation of students through a program of liberal education included in all curricula for constructive living and leadership in a free society. To achieve this goal or objective students must complete a minimum group of courses in the following areas: (a) communications, language, symbolic systems; (b) the physical and biological sciences; (c) man and society; and (d) artistic expression. To understand more about the All-University Council on Liberal Education requirements and how they pertain to your specific curriculum, refer to page .
3. Preparation for graduate study and careers in research and development.

Forestry graduates are responsible for the management of forest lands covering about one-third of the land area of the United States. The educational program in the College of Forestry prepares students in the Forest Resources Development and Forest Science curricula in the art, science, and business of managing forest lands for all their products (timber, water, wildlife, grazing, and recreation). Graduates in the Forest Products curricula are involved throughout the nation in the harvesting, processing, distribution, and marketing of forest products.

The graduate forester is a professional. His training for the first 2 years consists of a broad background of the liberal arts—humanities and social sciences as well as the biological and natural sciences. He must be skilled in the art of communication and he must be well versed in mathematics. The last 2 years of his program are set aside for professional courses.

Our graduates must know both *how* and *why* phenomena and techniques operate as they do. Beyond accepting professional responsibilities, they must assume citizenship responsibilities in communities and provide active leadership in the solution of the many social, economic, and other existing problems. The College's program is directed toward the development of professionally trained individuals who possess leadership interest and potential.

University Policy on Equal Employment Opportunity

The Board of Regents has committed itself and the University of Minnesota to the policy that there shall be no discrimination in the treatment of persons because of race, creed, color, sex, or national origin. This is a guiding policy in the admission of students in all colleges and in their academic pursuits. It is also to be a governing principle in University-owned and University-approved housing, in food services, student unions, extracurricular activities, and all other student and staff services. This policy must also be adhered to in the employment of students either by the University or by outsiders through the University and in the employment of faculty and civil service staff.

SECTION 2

GENERAL ACADEMIC REQUIREMENTS

The College of Forestry offers professional training leading to a wide variety of occupational outlets in the area of forestry and related fields.

Provided in Section 2 is background material on the College of Forestry, admission requirements, registration and class attendance, scholarship requirements, classification of students, and liberal education requirements. Students will find this material useful in planning their programs.

For more detailed information on general academic requirements, contact the College Office (10 Green Hall).

Degree Offered

The bachelor of science (B.S.) degree is awarded students completing the requirements of the undergraduate curricula offered in the College of Forestry.

Requirements for Bachelor's Degree in Forestry—Candidates will be recommended for graduation after completing the following requirements: (a) the prescribed curriculum, including required and elective credits to make the total number of credits required; (b) an average of 2 grade points per credit—i.e., the cumulative grade point average must be 2.00 or more (2.00=C). For additional quality requirements, see statements of prescribed curricula; (c) requirements for all students as noted (see page 15); (d) the residence and other general University requirements for graduation (see the *General Information Bulletin*).

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 Student Scholastic Standing Committee in 10 Green Hall for individual consideration.

The degree is granted "with distinction" if you attain a minimum grade point average of 3.00 for the entire curriculum. If you are a transfer student with less than 2 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 2-year residence requirements. Recommendations to the faculty for the degree "with distinction" are made through the Student Scholastic Standing Committee on the basis of scholarship and other evidence of satisfactory achievement and advancement in the curriculum pursued.

Your degree will be granted "with high distinction" if you attain a minimum grade point average of 3.50 for the entire curriculum. The same conditions for residence and recommendation apply as for the degree "with distinction."

Admission Requirements

To be admitted to the College of Forestry you must make application to the Office of Admissions and Records on the St. Paul Campus. Listed below are requirements for admission to the program in forestry. Other requirements and procedures having to do with nonresident admission, admission with advanced standing, adult special admission, and admission by examination appear in the *General Information Bulletin.*

High School Graduates—High school graduates in the upper 60 percent of their class may enter if they have completed 12 units in grades 10-12. Nine of these units should be in English, social studies and history, mathematics, natural science, and foreign languages. Distribution of these units with respect to forestry are outlined below:

> 3 units in English, 1 unit in elementary algebra, 1 unit in plane geometry, and 1 unit in higher algebra or equivalent courses, and 1 unit in natural science.

Exceptions to the specific requirements listed above may be made when additional information presented by the applicant indicates promise of academic success.

Adult Special Students—You may be admitted as a special student if you are a mature person (24 years of age 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.

Students who enter the College of Forestry as adult specials with the intention to transfer later to the Graduate School should be aware that a student may petition to transfer to his graduate record only the credits earned in his first academic quarter or summer as an adult or summer special student. Such work must be of graduate caliber and taught by a member of the graduate faculty. If his petition is approved, the student will be granted both residence and credit on his graduate record.

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

Admission with Advanced Standing—Credits from other accredited colleges and universities and from other colleges of the University of Minnesota which are appropriate for a student's course of study can be transferred to the College of Forestry. 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. Experience has shown that transfer credits for courses taken in forestry are frequently not applicable to courses offered in the junior and senior years, i.e., to courses numbered 3-000 or over. 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 in transferring to the College of Forestry to have planned your earlier programs carefully in order that your credits may apply with the greatest efficiency to the particular curriculum you desire to

enter. If you are beginning your work in an institution other than the College of Forestry, and plan to transfer at a later date, refer to the appropriate program section of this bulletin. There you will find descriptions 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 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 College of Forestry on the St. Paul Campus.

Examinations upon Entrance—If you are a new student you are expected to have completed the American College Testing program and the Minnesota High School Statewide Testing program. These may be taken at the time of registration if not completed previously. Other examinations given at entrance will test your aptitude and achievement in English. Your admission to the University will not depend upon the results of these examinations if you are otherwise qualified.

Transfer of Credit from Continuing Education and Extension—Transfer of credits and grades for courses taken through the programs of Continuing Education and Extension of the University of Minnesota to your permanent record may be accomplished through submission of a petition requesting such action to the College of Forestry Student Scholastic Standing Committee.

Proficiency Examination in Introductory Courses—The College of Forestry desires to correlate the courses taught here, as far as possible, with the technical courses 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 examinations in selected introductory courses will permit you to substitute other courses for these. Students wishing to take proficiency examinations or to secure more information concerning them should contact the College Office in 10 Green Hall.

For information about taking special examinations for credit, see the Index.

Registration and Class Attendance

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

Working with Your Faculty Adviser—Upon entry into the college, you will be assigned a faculty adviser on the basis of the curriculum you choose from among the several offered in forestry. He will interpret the curriculum to you, will guide in planning your program each quarter, and will be concerned about your general progress. Before you see your adviser at registration time, you should study curriculum requirements, course listings, and descriptions, and develop a tentative program with the aid of the *Class Schedule*.

Attention to Curriculum Requirements—It is your responsibility to know and meet all requirements prescribed for graduation in the curriculum you select. This includes the all-college major and, where applicable, the area of emphasis requirements. If you have questions relative to any requirements, consult your faculty adviser.

Minimum of 36 Credits per Year Requirement—The policy of the College of Forestry is that students will be required to complete at least 36 credits during any 3 consecutive quarters in residence. Students would be allowed to attend summer terms I and/or II to attain a minimum of 36 credits earned per 3 consecutive quarters in residence. Students with extenuating circumstances (such as heavy workloads, etc.) would be given special consideration by contacting the Student Scholastic Standing Committee (College Office, 10 Green Hall).

Quantity of Work—The normal load of work for each quarter is 14 to 18 credit hours. A credit hour requires on the average 3 hours each week. These may be distributed as follows: 1 hour of lecture or recitation requiring 2 hours of preparation; 2 laboratory periods requiring 1 hour of preparation; or 3 laboratory periods requiring no outside preparation. Student programs in the College of Forestry may vary in load according to the student's ability or circumstance. To carry more than 21 hours of credit, you must have a B average in work of the previous quarter and must secure permission from the Student Scholastic Standing Committee.

Auditors—The approval of the Student Scholastic Standing Committee, your adviser, and the instructor 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 fees 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 change of registration 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 6 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, the instructor, and the Student Scholastic Standing Committee. However, withdrawal from a course after the sixth calendar week of the quarter is strongly discouraged unless extenuating circumstances exist. *Cancellations within the last 2 weeks prior to the beginning of the quarterly final exam period will seldom be approved.* 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 I. *A student who discontinues attending class after the sixth week but does not officially cancel will receive a grade of I.*

During the first 3 days of the quarter you may add a course with the approval of your adviser only. After the first 3 days you must have the approval of your adviser, the instructor, and the Student Scholastic Standing 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 6 weeks entitles you to a refund proportional to the amount of time you attended class. If you do not attend, you are entitled to a full refund.

Independent Study and Extra Credit Registration—Often students prefer to study some courses on their own rather than through usual class participation and regular instructor direction. Opportunity to study in this way has long been

available to College of Forestry students through the credit-by-examination (or other method of evaluation) in almost any course in the college, after studying the material in whatever way he wishes. Because the procedure has not been widely used, the faculty has initiated additional approaches to independent study in the hope of attracting more students to this valuable way of learning.

Independent Study Registration—Students would be able to take the course without attending class.

Registration for independent study counts as part of the regular credit load and regular fees are charged. The student must take the final at the regular time (or at a time directed by the instructor) and meet prescribed deadlines for any other work required. The usual regulations about grades, incompletes, and cancellations apply.

The student must be referred to the instructor. In order to maintain proper records on this out-of-the-ordinary registration, the student should bring his permission slip to the Office of Admissions and Records, 130 Coffey Hall, so that his registration can be checked.

The registration card should show the course number followed by a capital "Y" (example: Agro 1-010Y).

Extra-Credit Registration—Registration for extra credit (1 to 3) in conjunction with a course a student is taking or has taken requires approval of the instructor. The student does the work independently, meeting such evaluative standards as the instructor sets. This provides the opportunity for more intensive study of a topic in the regular course or extension beyond the course to a closely related topic. Such registrations should not be used when the department offers a regular course which has the same objective.

The student should bring his special permission slip, approved by the instructor, to the Office of Admissions and Records. The usual regulations concerning fees, grades, and cancellations apply. On the registration card he enters the course number followed by a capital "X" (example: Agro 1-010X). Such registrations are not reserved.

Credit and Grade Arrangements for Courses Repeated—College of Forestry students may repeat courses in which thye have received passing grades. The student who has a grade point deficiency may find that repeating courses in which he has received D grades advantageous, in that the grade and credit for the previous experience are deleted for purposes of calculating the present grade point average and the grade and credit received upon completion of the course the second time become the record for that course.

Class Attendance—On the St. Paul Campus attendance is compulsory for certain classes only, because of the nature of such classes. If you miss class for good reasons beyond your control, you have the privilege of requesting the instructor's assistance in making up the classwork you miss. The instructor is under no obligation, however, to give assistance if you willfully or deliberately absent 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: (a) illness certified by the Health Service or by the family physician; (b) emergencies caused by a death or serious illness in the immediate family; (c) absences

approved by the Student Scholastic Standing Committee; and (d) participation in University-approved, cocurricular activities (certification that a student was absent from class because he was engaged in such activities will be made by the Office of Student Affairs).

If you wish to make up work, you should confer directly with the instructor in regard to the justification for your absence and the possibility and ways of making up the classwork. The Student Scholastic Standing Committee will enter into the situation only when special emergencies (items b and c above) are involved and as an appeal agency.

Credit by Special Examination or Through Reading Courses—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 quarter in residence without fee; after that time a fee of $20 is required. Special examinations in which a grade of C or better is earned are recorded with credit and grade, as part of the student's college record.

You may register for a course as a reading course (individual work) during the quarter in which the course is regularly offered, with the approval of your adviser, the instructor in the course, and the Student Scholastic Standing Committee, under the following situations:

1. When a course normally offered is canceled because of inadequate registration.
2. When, because of conflicts, the student finds it impossible to schedule the course at the time it is offered.

It is assumed that you will complete the work of the course during the quarter in which you are registered for it and take the final examination at the regularly scheduled time.

Quality Credits—The number of free elective credits required for graduation may be decreased by 1 for each 5 grade points in excess of those required to reach an average of 2.70. 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 grade points.

Mathematics Placement—Initial registration for courses in mathematics will be based on courses taken in high school, the quality of this work, and results on the mathematics section of the American College Testing (ACT) program. A refresher course at extra cost will be required of those students whose background in elementary and higher algebra proves insufficient to permit them to move into advanced courses.

In those programs requiring trigonometry, students with acceptable performance in high school trigonometry will not need to take Math 1-008 (Trigonometry) at the college level.

Grading System

Academic progress in the College of Forestry may be evaluated by one of two grading systems, the traditional letter grade system (A-F) or the P-N system now in use on a trial basis.

A-F System

Under the A-F system (A-B-C-D-F), each letter grade carries the following meaning and number of grade points per credit:

Grade	*Grade Points Per Credit*
A	4
B	3
C	2
D	1
F	0

The grade point average is determined by dividing the sum of the grade points by the sum of the credits passed and failed. Accumulative average of 2.00 (C) is required for graduation. Additional requirements related to the grade point average may be found in materials descriptive of specific curricula (see requirements for attaining junior status, page 14).

P-N System

A grading system directed toward encouraging students to explore academic areas other than those closely related to the major and to develop a greater breadth of education is now available. The P-N system hopefully reduces to some extent the pressures associated with the traditional grading system.

Under the P-N system the symbol P stands for pass and N for no credit. The dividing line between P and N is approximately the same as that between D and F. N grades are not included in the computation of the grade point average, but credits of P will count toward graduation.

The following principles have been adopted as a guide for use of the P-N grading system by College of Forestry students:

1. All courses available to undergraduate students (those numbered under 8-000) are available on the P-N and the A-F basis except where specifically restricted by the department offering the course (consult course listings in this bulletin—see item 6 below).
2. A candidate for the baccalaureate degree from the College of Forestry may present a maximum of 25 percent of the residence course credits offered for graduation in courses in which the student received a grade of P.
3. The P-N system shall be available to a student of the College of Forestry irrespective of his academic standing.
4. A student will be limited to one course per quarter on the P-N grading system until such time as he has completed 36 credits. This option shall be in excess of any courses offered on the P-N basis only.
5. A student registered under the P-N grading system may make a change to the A-F grading system during the first 2 weeks of the quarter.
6. Where a course is identified by title and number in bulletin copy as being *required*, or as being *the* course recommended to fulfill a curriculum requirement it will be taken under the A-F grading system. Prerequisites for required courses and courses in the major will be taken under the A-F system, unless exceptions are established.

Your adviser or the College Office, 10 Green Hall, will help you if you should have questions about use of the P-N system.

Other Symbols that May Be Used on the Transcript

The registration symbol I (incomplete) shall be assigned when a student neither earns a final grade by completing a course nor qualifies for a W (withdrawal) as defined below. A student may earn a permanent grade in place of an I with the permission of the instructor (or of the department in the unavailability of the instructor). For the convenience of both students and instructors, I's should be made up early in the next regular quarter of attendance, but instructors may extend the time if they believe delay is justified.

An I which is not made up remains on the student's record; it does not count in the grade point average. When an I is made up it is removed from the record.

The registration symbol W indicates official cancellation from a course without grade. This shall be assigned in all cases of official cancellation during the first 6 weeks of classes irrespective of the student's standing. After 6 weeks, W shall be posted only if the student is not failing at the time of official cancellation. Whether or not cancellation is permitted is within the authority of the student's adviser and the Student Scholastic Standing Committee to determine.

The symbol X may be reported in continuation courses in which a student is permitted to continue but in which a grade cannot be determined until the sequence is completed. A grade will be submitted by the instructor for each X when the student has completed the entire sequence.

Registration as an auditor or visitor is indicated by the registration symbol V (visitor). Such registration requires the permission of the instructor and the adviser.

A symbol T (transferred) indicates credits transferred from another institution or from one college to another within the University of Minnesota when reevaluation is required. It is posted as a preceding supplement to the original grade.

If additional information about grading symbols is needed, a student should contact the Office of Admissions and Records, 130 Coffey Hall, or the College Office (10 Green Hall).

Academic Requirements

Satisfactory Progress—As a student in the College of Forestry you are expected to make satisfactory progress in the curriculum you have selected. This is interpreted to mean a C average. The cases of students who are not reaching this standard are considered by the Student Scholastic Standing Committee. It is always best for a student to see his class instructor or his faculty adviser as soon as he feels himself in difficulty rather than to wait until he has already received a poor grade.

In some curricula, as indicated in Section 3, a higher grade point average is required.

Scholastic Probation—If a student's scholastic work should be considerably below a satisfactory level of performance, he will be placed on probation and

his program or work will be restricted as seems advisable to the Student Scholastic Standing Committee.

A student will be placed on probation if, at the end of 3 quarters of work or earlier, he has not attained a grade point average of 1.75. At the end of 6 quarters or earlier, he will be placed on probation if he has not attained a grade point average of 1.90.

Exclusion from the College of Forestry—Students may be excluded from the college under one of the following headings:

1. *Dropped for Low Scholarship*—When it becomes apparent that a student's work is of a quality that will not lead to graduation, he will be dropped and usually will not be permitted to apply for readmission until 2 quarters later.

A freshman may be asked to withdraw when his grade point average is less than 1.50 after 2 or 3 quarters of work in this college. A sophomore may be dropped if his average is less than 1.75 after 6 quarters (or 5 quarters 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.

2. *Hold for Committee Clearance*—Sometimes a student's scholastic difficulty indicates that he should not continue for the time being even though the record hardly requires official drop action. In such cases his later return must be approved by the Student Scholastic Standing Committee.

3. *Discontinued*—If a student is pursuing an appropriate course but is handicapped by conditions he cannot control (ill health, necessary outside work, etc.) he may be required to discontinue his registration until these conditions have improved. When discontinuance takes place at any time other than the end of the quarter, the courses for which he is registered may be recorded as canceled without grade (W).

Readmission—If a student is dropped, he may not return without the permission of the Student Scholastic Standing Committee. Credits earned at other institutions during the period of suspension will not apply toward graduation from this college unless permission to earn such credits was given in advance by the Student Scholastic Standing Committee. If he is permitted to return, he will be placed on probation and may be dropped again at any time when his 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 3 quarters of college work, you will be classified as a sophomore. The 3 quarters may include time spent at another institution of collegiate rank. A sophomore who lacks not more than 12 credits of being a junior and who has a B average may be permitted to register for courses in the 5-000 group. Students who have not attained junior classification and who are below a C average will not be permitted to register for courses numbered 5-000 or above for which graduate credit is given.

Junior—A total of 90 credits with a grade point average of at least 2.00 and completion of the rhetoric communications requirement 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 3 years in your curriculum.

Transfer Students—If you transfer from a college outside the University and enter this college, you must have a grade point average of not less than 2.00.

Upper Division Classification for Forest Resources Development Curriculum—The student must have (a) a minimum grade point average of 2.00 and (b) 80-90 credits. Courses required are:

AgEc 1-020—Principles of Macroeconomics (5)
AgEn 1-010—Technical Drawing (3)°°
Biol 1-011—General Biology (5)
Bot 1-001—General Botany (5)
Chem 1-004, 1-005—General Principles (10)
ForP 1-301—Wood as a Raw Material (4)
FRD 1-200—Introduction to Forestry and Conservation (4)
Geo 1-001—Physical Geology
Math 1-008—Trigonometry (3)°°
Math 1-111—College Algebra (5)
Phys 1-031—General Physics (5)
Rhet 1-101, 1-102—Freshman Communications (8)
Rhet 1-222—Public Speaking (4)

There will be exceptions to the above list of required courses for Upper Division classification, but the student will have to petition to receive Upper Division classification if he does not have the above list of courses. This would mean that the above-listed courses would have to be completed before the Itasca Forestry Session.

Requirements for All Students
Council on Liberal Education

In addition to the specific requirements of each curriculum, the University of Minnesota believes that all of its students, whatever their area of specialization or their vocational goals, should have a broad liberal education. A liberal education helps improve ones communication skills and knowledge; gives the student a better understanding of the ways in which scientists contribute to a man's knowledge of himself and his environment; allows the student to have a greater historical and philosophic perspective on the nature of our own lives and the world in which we live; and permits the student to better appreciate the cultural benefits in our lives provided by the study of literature and the arts.

Rapid and dynamic changes and innovations are constantly occurring in all professions. Only those persons with wide horizons, and with sensitivity and perspective will be able to make the wise value judgments and adjustments required by these changes. By encouraging a liberal education the college hopes to prepare a student to be poised, articulate, and able to communicate his ideas, and to have an appreciation of the value of interpersonal relationships. The college believes that these goals can be encouraged and sought concurrently with the development of technical professional competence in depth in the student's specialty.

°° Students with a grade of C or better in high school trigonometry are exempt from Math 1-008, Trigonometry; others must take Math 1-008. Students with a grade of C or better in high school drawing are exempt from AgEn 1-010, Technical Drawing; others must take AgEn 1-010.

Section 2—General Academic Requirements

To help students achieve the goals of liberal education, the College of Forestry expects every student to distribute a part of his course work in each of the four categories listed.

I. Communication, Language, Symbolic Systems (20 credits)
   - A. English and Foreign Language Communication Skills
   - B. Linguistics, Rhetoric, Logic, and Philosophic Analysis
   - C. Mathematics

II. The Physical and Biological Sciences (25 credits)
   - A. The Physical Universe
   - B. The Biological Universe

III. Man and Society (8-10 credits)
   - A. Analysis of Human Behavior and Institutions
   - B. Development of Civilization: Historical and Philosophical Studies

IV. Artistic Expression (8-10 credits)
   - A. Literature
   - B. The Arts

In category I, students will be expected to take a minimum of 8 credits of freshman communications. Transfer students from other colleges with less than 8 credits in freshman communications or the equivalent will be placed in Communications I or II, depending upon their needs as revealed by the diagnostic testing program.

Public Speaking (4 credits) and Professional Writing or Scientific and Technical Writing (3 credits) will also be taken by all students. Most students register for Rhet 1-222 (Public Speaking) as sophomores, and for Rhet 3-551 or Rhet 3-562 (Scientific and Technical Writing) during their junior or senior year. An exemption examination for Rhet 3-551 or Rhet 3-562 is available to students of above-average competence in communication skills. This examination is given once each quarter at a time specified by the Department of Rhetoric. A course in advanced composition taken at some other college cannot be used to satisfy the Rhet 3-551 or Rhet 3-562 requirement.

No more than 6 credits in any one discipline (i.e., Economics, Psychology, etc.) may be counted toward the Category III requirements.

Council on Liberal Education Course List—Because of the numerous course revisions associated with the change in the major course credit module and the unavailability of the new listings at the time this bulletin was printed, the C.L.E. course list has been omitted. Advisers may be guided by the revised list available in the College Office. An up-to-date list may be obtained by writing to the Director of Undergraduate Programs, College of Forestry, University of Minnesota, St. Paul, Minnesota 55101.

Rhetoric Communications Requirement

Before you graduate from the College of Forestry, you must demonstrate proficiency in public speaking and in written composition. Most of the students register for Rhet 1-222 (Public Speaking) as sophomores, and satisfy the Rhet 3-551 or Rhet 3-562 requirement by taking this course during their junior-senior

year (Professional Writing or Scientific Technical Writing). An exemption examination for Rhet 3-551 or Rhet 3-562 is available to students of above-average competence in communication skills. This examination is given once each quarter at a time specified by the Department of Rhetoric. A course in advanced composition taken at some other college cannot be used to satisfy the Rhet 3-551 or Rhet 3-562 requirement.

Physical Education and Music

Limitations on Use of Elective Credit—Students in forestry are not required to take courses in physical education. Not more than 9 credits in physical education may be counted toward graduation.

A maximum of 9 credits in music may be used as elective credits toward graduation, with not more than 6 of these in Mus 1-430 or in Concert Band.

Junior-Senior Requirements

Junior-Senior Program

Specialization—In your sophomore year, after you have completed the equivalent of 5 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 one of the curricula listed in this bulletin. If this specialization card is not filed at the designated time, your registration may be withheld. Advanced standing or transfer students must complete a specialization card in consultation with their adviser.

The curriculum indicated on your specialization card becomes your curriculum required for graduation. Copies of the approved curriculum are sent to you, to your adviser, and to the Student Scholastic Standing Committee. In case the major is changed to a different field of work, a new adviser must be selected and your specialization card resubmitted, after obtaining approval of the Student Scholastic Standing Committee.

Electives—You should consult with your adviser as to your choice of electives. Electives taken by students registered in the College of Forestry may, upon approval of your adviser and the Student Scholastic Standing Committee, be omitted from the courses offered for graduation. These electives, in amounts not to exceed 10 credits, may be withheld (from the list of courses counted toward a degree) to raise the grade point average only in instances relating to the securing of junior classification or in meeting the graduation requirement of 2.00. After a course has been withheld from the undergraduate record as authorized above, it shall not be reinstated other than by special examination or through repeating the course.

Use in the Graduate School of Credits Earned While an Undergraduate

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:

Section 2—General Academic Requirements

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 5-000 or above) 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. In order to hold these credits available for use at the graduate level, a petition must be submitted to the College of Forestry Student Scholastic Standing Committee at the time of registration for the last quarter, requesting that these specified credits be withheld from the undergraduate transcript. Transfer of credit must be arranged by petition to the Graduate School.
2. If you lack not more than 9 credits for graduation, you may register in the Graduate School.

SECTION 3

PROGRAMS AND CURRICULA

A. UNDERGRADUATE PROGRAMS IN 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 College of Forestry had its formal beginning. Since that time more than 2,500 foresters have been granted undergraduate and graduate degrees.

The bachelor of science degree is granted upon completion of 192 credits of required and elective courses in the following curricula or majors:

1. FOREST RESOURCES DEVELOPMENT CURRICULUM
   with related areas in . . .
   - Biology
   - Ecology and Silviculture
   - Economics and Policy
   - Hydrology
   - Management and Administration
   - Measurement and Quantitative Analysis
   - Range and Wildlife
   - Recreation
   - Urban Forestry
   - Wood and Fiber Products

2. FOREST SCIENCE CURRICULUM
   with specializations in . . .
   - Natural Science
   - Social Science

3. FOREST PRODUCTS CURRICULUM
   with specializations in . .
   - Manufactured Housing
   - Marketing
   - Pulp and Paper
   - Wood Science and Technology

4. RECREATION RESOURCE MANAGEMENT CURRICULUM

The College of Forestry is fully accredited by the Society of American Foresters, the national accrediting agency for United States forestry schools.

Facilities

The College of Forestry possesses excellent facilities for training in the fields of forest resources development and forest products. Located in St. Paul and consisting of two modern buildings, Green Hall and the Forest Products Building, it draws on many departments on both the St. Paul and the Minneapolis Campuses for instruction in courses basic to the training of foresters and forest products specialists. Also housed in Green Hall is the branch office of the U.S.

Bureau of Sport Fisheries and Wildlife. Located next to Green Hall and the Forest Products Building is the regional headquarters building of the North Central Forest Experiment Station of the U.S. Forest Service.

The following field laboratories are available:

The *John H. Allison Forest* of over 300 acres, located within 10 miles of the campus, is 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 Forestry Center.

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 resources development and forest science majors. Here in a 3½-week summer term, starting the last week of August, students have an opportunity to study forest botany, forest ecology, and field 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.

The *Cloquet Forestry Center* 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 fall quarter or spring quarter of the senior year for forest resources development students is spent at Cloquet. Included is training in all aspects of forest establishment, management, harvest, and utilization. Also covered are aerial and forest surveys, wildlife, hydrology, recreation and forest protection from fire, insects, and diseases. Students visit local industries and study all forestry agencies in Minnesota and Wisconsin. Housing, dining hall facilities, and classrooms are available.

Available in Green Hall and the Forest Products Building, for training students interested in employment in the forest products industries and for building products marketing, are several well-equipped laboratories: wood working, wood chemistry, timber testing, and wood preservation. Local millwork and furniture plants, pulp and paper mills, building products marketing and sales groups, and wood preservation concerns provide added opportunity for training students in the several wood-utilization fields.

The Work of Foresters

The work of foresters is diverse. Forest resources development graduates are concerned primarily with the scientific management of the forest, wildlife, recreation, grazing, and water resources on approximately one-third of the land area of the United States which is classified as forest land. Until recently public forest land-managing agencies—federal, state, county, and municipal—employed most of the graduates in these fields. Within the past 15 to 20 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. Forest science majors are particularly well qualified for graduate study leading to research with industrial, governmental, or educational organizations or to technical and professional teaching at the college level.

Graduates trained in the several utilization fields—forest products curriculum with specializations in manufactured housing, marketing, pulp and paper, and

wood science and technology—find employment in the development, production, and marketing of forest products.

Brochures and leaflets describing employment opportunities for graduates of this curriculum are available from the college.

General Information

The first 2 years of work in all forestry curricula is devoted primarily to basic courses such as physics, chemistry, biology, mathematics, rhetoric, economics, sociology, and government. Because the first year of basic work is somewhat similar in all curricula, students may transfer between curricula at the completion of their freshman year with little loss of credit.

The 3½-week Summer Session term at the Lake Itasca Forestry and Biological Station at Itasca State Park is required of all forest resources development and forest science majors, including transfer students. This requirement must be completed just prior to the junior year.

The fall quarter or spring quarter of the senior year for those in the forest resources development curriculum is spent at the Cloquet Forestry Center.

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 humanities and social sciences. This need is met through the All-University Council on Liberal Education (C.L.E.) requirements. Please see page 15.

Students registered in preforestry curricula at state, junior, and private colleges should complete the basic course requirements included in the College of Forestry curricula if they are to receive full credit on transfer for work completed. In addition, students registered in preforestry curricula should plan to transfer at least by the end of their second year if they expect to complete the professional course requirements of the College of Forestry in 2 years. Please see page 15.

Preforestry students must complete the 3½-week Summer Session requirement at the Lake Itasca Forestry and Biological Station between the sophomore and junior years.

Students are encouraged to obtain practical experience in forestry or the forest products industries during summer vacations. Although work experience is not required for graduation, students find that the possession of such experience is an excellent recommendation when seeking employment. The College of Forestry assists students in obtaining summer employment with such federal agencies as the United States Forest Service, various state agencies, and with private companies. The college operates a job placement program for graduates of its several curricula.

The college entrance requirements apply to high school graduates planning to register in forestry curricula. Students must have had at least 3 units of mathematics, including elementary algebra, plane geometry, and higher algebra. Students with a low ACT mathematics score must complete a noncredit course, Math 0-009, at the University.

Curricula and Requirements

Work leading to the bachelor of science degree on the completion of 4 years of satisfactory work is offered in the following curricula:

1. FOREST RESOURCES DEVELOPMENT

This curriculum is intended for students interested in forest land management. It includes related areas in biology, ecology and silviculture, economics and policy, hydrology, measurement and quantitative analysis, range and wildlife, recreation, urban forestry, and wood and fiber products. Students may enter graduate study from this curriculum.

2. FOREST SCIENCE

Preparation for advanced professional training directed toward research with public and private organizations, or toward college and university teaching; for work in other professional activities requiring advance training.

3. FOREST PRODUCTS

This curriculum is for the training of students for a broad range of career opportunities in the forest products industries. A selection of courses toward more specific professional objectives is represented in the specialized programs.

4. RECREATION RESOURCE MANAGEMENT

The recreation resource management major is designed to train recreation specialists for the broad area of recreation resource planning and management involving land and water areas. The program provides the background necessary for participation in the expanding county, regional, state, and federal resource-oriented recreation programs. Students who complete this program may elect graduate study in more specialized training areas.

A detailed listing of these four curricula will be found on page 23.

During the first year, the work in all forestry curricula is similar and is devoted largely to study of general courses. Required course work for the 4 years varies with curriculum and specializations (131-154 credits). In addition to completion of required courses, students must complete sufficient elective courses to make a total of 192 credits. No more than 7 credits of D quality work is permitted in required forestry courses.

Credit earned in ROTC can be applied toward graduation in the elective group.

The attention of all students is called to the Council on Liberal Education (C.L.E.) requirements. Please see page 15.

Fees for Field Training Sessions

(Not listed in *General Information Bulletin*)

The following fees and expenses are paid during the field-training sessions at Cloquet and Itasca. These fees are subject to change.

Cloquet Session (students in the forest resources development curriculum—fall or spring quarter):

Tuition	
Residents of Minnesota	$161.00
Nonresidents	443.00
Health fee	$ 21.00

In addition, a nominal charge will be made to each student for use of the dormitories.

Itasca Forestry Session (to be completed between the sophomore and junior years; starts late in August and runs for 3½ weeks):

Tuition	
Resident of Minnesota	$75.00
Nonresidents	$75.00
Student Services fee	$ 8.75

In addition, a nominal charge will be made to each student for cabin rental. The Forestry Student Cooperative also pays 5 percent of its gross commissary operating expenses for use of dining hall facilities, breakage, etc.

B. CURRICULA IN FORESTRY

1. FOREST RESOURCES DEVELOPMENT CURRICULUM

This curriculum is intended for students interested in forest land management. It includes related areas in biology, ecology and silviculture, economics and policy, hydrology, measurement and quantitative analysis, range and wildlife, recreation, urban forestry, and wood and fiber products. Students may enter graduate study from this curriculum.

Core Curriculum

(required of all related areas)

FRESHMAN YEAR

Biol 1-011—General Biology (5)
Bot 1-001—General Botany (5)
Chem 1-004—General Principles (5)
Chem 1-005—General Principles (5)
FRD 1-200—Introduction to Forestry and Conservation (4)
Geo 1-001—Physical Geology (5)
Math 1-111 or 1-441 or 1-211—College Algebra, Analytical Geometry or College Algebra or Analysis I (5)
Rhet 1-101—Freshman Communications (or pass English proficiency examination) (4)
Rhet 1-102—Freshman Communications (or pass English proficiency examination) (4)
Students with a grade of C or better in high school mechanical drawing are exempt from AgEn 1-010, Technical Drawing; others must take AgEn 1-010.
Students with a grade of C or better in high school trigonometry are exempt from Math 1-008, Trigonometry; others must take Math 1-008
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total credits (42)

SOPHOMORE YEAR

AgEc 1-020—Principles of Macroeconomics (5)
ForP 1-301—Wood as a Raw Material (4)
Phys 1-031—General Physics (5)
Rhet 1-222—Public Speaking (4)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
FBio 1-100—Dendrology (4), AgEn 1-400—Surveying (4), and Soil 1-222—Introduction to Soil Science (4) may be taken by sophomores if recommended by their adviser
AgEc 1-020 partially satisfies category III under the C.L.E. requirements
Total credits (18)

Lake Itasca Forestry and Biological Station—Summer Session for Foresters (3½ weeks). Required of all Forest Resources Development and Forest Science majors. Must be completed between sophomore and junior years. All Lower Division courses must be completed. Students must have a minimum grade point average of 2.00.

FBio 3-100—Important Forest Plants (2)
FBio 3-101—Forest Ecology (3)
FRD 3-201—Field Forest Measurements (1)
Total required credits (6)

JUNIOR YEAR

AgEn 1-400—Surveying (4)
FBio 1-100—Dendrology (4)
FBio 5-100—Silviculture (4)
FRD 3-202—Forest Mensuration (3)
FRD 5-200—Aerial Photo Interpretation (3)
FRD 5-201—Statistical Methods in Forestry (4)
FRD 5-212—Forest Economics (4)
FRD 5-213—Forest Management and Administration (5)
FRD 5-230—Forest Fire (2)
FRD 5-232—Management of Recreational Lands (3)
FRD 5-237—Forest Meteorology and Hydrology (4)
FW 3-050—Principles of Fisheries and Wildlife Management (3)
Soil 1-122—Introduction to Soil Science (4)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (47)

SENIOR YEAR

Ent 3-050—Forest Entomology (4)
FRD 5-236—Senior Seminar (1)
PlPa 3-050—Forest Pathology (4)
Rhet 3-562—Technical Writing (3)

Cloquet Forestry Center—Students in all related areas are required to attend the Cloquet fall or spring session during their senior year. Students must meet the following requirements:

1. A grade point average of at least 2.00 at the end of the quarter preceding the Cloquet Session.
2. Completion of the Itasca Summer Session and AgEn 1-400; FRD 5-200, 5-201, 5-212, 5-213, 5-230, 5-232, 5-237; FBio 5-100; FW 3-050; and Soil 1-122.
3. Health Certificate—A certificate of physical fitness must be obtained from the Health Service prior to the end of the quarter in which you plan to attend the Cloquet session. This certificate must then be turned in at the Office of Admissions and Records at the time of registration.

FW 3-167—Techniques of Wildlife Management (2)
FBio 5-101—Field Silviculture (5)
FRD 5-202—Forest Inventory, Photographic Interpretation (4)
FRD 5-210—Multiple Use (5)
FRD 5-234—Forest Protection (2)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (30)

TOTAL GRADUATION REQUIREMENTS

Required courses listed above (143 credits), plus credits to satisfy C.L.E. requirements, plus electives sufficient to total 192 credits shall be completed for the bachelor of science degree

Related Areas

Thirty-eight elective credits are required, as a minimum, to complete requirements for the bachelor of science degree. Development of related areas of study must be done in consultation with faculty advisers. For advice on courses to take in these areas, please go to 10 Green Hall and pick up information sheets on the related areas. Some illustrative subject matter fields for the related areas of study in addition to forestry are as follows:

Biology—Biology, botany, business administration, chemistry, ecology, genetics, pathology, and soil science

Ecology and Silviculture—Biology, botany, business administration, ecology, entomology, genetics, pathology, and soil science

Economics and Policy—Agricultural economics, anthropology, business administration, economics, geography, political science, and sociology

Hydrology—Agricultural engineering, civil, industrial, and sanitary engineering, ecology, geology, mathematics, meteorology, physics, and soil science

Management and Administration—Business administration, biometrics, industrial engineering, mathematics, political science, psychology, and sociology

Measurement and Quantitative Analysis—Biometrics, industrial engineering, management, mathematics, quantitative analysis, and statistics

Range and Wildlife—Agronomy, animal science, botany, business administration, ecology, fisheries and wildlife, and zoology

Recreation—Accounting, business administration, business law, ecology, geography, horticulture, psychology, recreation, and sociology

Urban Forestry—Agricultural engineering, agronomy and plant genetics, botany, business law, ecology and behavioral biology, entomology, fisheries and wildlife, geography, horticultural science, plant pathology, sociology, and soil science

Wood and Fiber Products—Architecture, chemistry, industrial engineering, marketing, mathematics, pathology, and physics

2. FOREST SCIENCE CURRICULUM

This curriculum is designed for students intending to pursue graduate work with a research or teaching objective. Although designed with this intent, it does provide background with which a student may enter the field of resources management. At the end of his freshman year, the student must select between the two specializations, one in natural sciences, the other in social sciences.

Only students with an above-average high school record or a demonstrated potential for academic excellence following their freshman and sophomore years in college should attempt to follow this curriculum.

This curriculum encourages individuality in course selection and includes a senior research thesis. Your adviser will work closely with you to advance your learning experience at the University of Minnesota.

Natural Science Specialization

FRESHMAN YEAR

AgEc 1-020—Principles of Macroeconomics (5)
Biol 1-011—General Biology (5)
Bot 1-001—General Botany (5)
Chem 1-004—General Principles (5)
Chem 1-005—General Principles (5)
FRD 1-200—Introduction to Forestry and Conservation (4)
Rhet 1-101—Freshman Communications (or pass English proficiency examination) (4)
Rhet 1-102—Freshman Communications (or pass English proficiency examination) (4)
Students with a grade of C or better in high school trigonometry are exempt from Math 1-008, Trigonometry; others must take Math 1-008
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (37)

SOPHOMORE YEAR

Chem 3-301—Organic Chemistry (5)
Chem 3-302—Organic Chemistry (5)
ForP 1-301—Wood as a Raw Material (4)
Math 1-411, 1-421, 1-431—Pre-Calculus, Calculus I and II (15)
(or) Math 1-211, 1-221, 1-231—Analysis I, II, and III
Phys 1-031—General Physics (5)
Phys 1-032—General Physics (5)
Rhet 1-222—Public Speaking (4)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (43)

Lake Itasca Forestry and Biological Station—Summer Session for Foresters (3½ weeks). Required of all Forest Resources Development and Forest Science majors. Must be completed between the sophomore and junior years. All Lower Division courses must be completed. Students must have a minimum grade point average of 2.00.

FBio 3-100—Important Forest Plants (2)
FBio 3-101—Forest Ecology (3)
FRD 3-201—Field Forest Measurements (1)
Total required credits (6)

JUNIOR YEAR

FBio 1-100—Dendrology (4)
FBio 5-100—Silviculture (4)
FRD 3-202—Forest Mensuration (3)
FRD 5-200—Aerial Photo Interpretation (3)
FRD 5-201—Statistical Methods in Forestry (4)
FRD 5-212—Forest Economics (4)
FRD 5-213—Forest Management and Administration (5)
FRD 5-230—Forest Fire (2)
FRD 5-237—Forest Meteorology and Hydrology (4)
Rhet 3-562—Technical Writing (3)
Soil 1-122—Introduction to Soil Science (4)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (40)

SENIOR YEAR

Ent 3-050—Forest Entomology (4)
(or) PlPa 3-050—Forest Pathology
FRD 5-236—Senior Seminar (1)
FBio 5-401, FRD 5-401, ForP 5-401—Senior Topics (4)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (9)

TOTAL GRADUATION REQUIREMENTS

Required courses listed above (135 credits), plus additional credits to satisfy the C.L.E. requirements, plus electives sufficient to total 192 credits shall be completed for the degree

RECOMMENDED BUT NOT REQUIRED

Cloquet Forestry Session—Students must meet the following requirements:

1. A grade point average of at least 2.00 at the end of the quarter preceding the Cloquet session.
2. Completion of the Itasca Summer Session and AgEn 1-400; FRD 5-200, 5-201, 5-213, 5-230, 5-232, and 5-237; FW 3-050; and Soil 1-122.
3. Health Certificate—A certificate of physical fitness must be obtained from the Health Service prior to the end of the quarter in which you plan to attend the Cloquet session. This certificate must be turned in at the Office of Admissions and Records.

FW 3-167—Techniques of Wildlife Management (2)
FBio 5-101—Field Silviculture (5)
FRD 5-202—Forest Inventory, Photo Interpretation (4)
FRD 5-210—Multiple Use (5)
FRD 5-234—Forest Protection (2)
Total required credits at Cloquet (18)

Social Science Specialization

FRESHMAN YEAR

Biol 1-011—General Biology (5)
Bot 1-001—General Botany (5)
Chem 1-004—General Principles (5)
Chem 1-005—General Principles (5)
FRD 1-200—Introduction to Forestry and Conservation (4)
Math 1-441, 1-442, 1-443—College Algebra, Calculus I and II (15)
(or) Math 1-211, 1-221, 1-231—Analysis I, II, and III
Rhet 1-101—Freshman Communications (or pass English proficiency examination) (4)
Rhet 1-102—Freshman Communications (or pass English proficiency examination) (4)
Students with a grade of C or better in high school trigonometry are exempt from Math 1-008, Trigonometry; others must take Math 1-008
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (47)

SOPHOMORE YEAR

AgEc 1-020—Principles of Macroeconomics (5)
ForP 1-301—Wood as a Raw Material (4)
Phys 1-031—General Physics (5)
Rhet 1-222—Public Speaking (4)
Soc 3-801—Sociological Methods** (3)
Soc 3-802—Sociological Methods** (3)
Soc 3-803—Sociological Methods** (3)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (27)

** Or another 9-credit sequence in quantitative methods agreed upon between student and adviser.

Lake Itasca Forestry and Biological Station—Summer Session for Foresters (3½ weeks). Required of all Forest Resources Development and Forest Science majors. Must be completed between the sophomore and junior years. All Lower Division courses must be completed. Students must have a minimum grade point average of 2.00.

FBio 3-100—Important Forest Plants (2)
FBio 3-101—Forest Ecology (3)
FRD 3-201—Field Forest Measurements (1)
Total required credits (6)

JUNIOR YEAR

FBio 1-100—Dendrology (4)
FRD 3-302—Forest Mensuration (3)
FRD 5-200—Aerial Photo Interpretation (3)
FRD 5-210—Silviculture (4)
FRD 5-212—Forest Economics (4)
FRD 5-230—Forest Fire (2)
FRD 5-235—Forest Meteorology and Hydrology (4)
FW 3-050—Principles of Fisheries and Wildlife Management (3)
Soil 1-222—Introduction to Soil Science (4)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (31)

SENIOR YEAR

FRD 5-213—Forest Management and Administration (5)
FRD 5-232—Management of Recreational Lands(3)
FRD 5-236—Senior Seminar (1)
FRD 5-401—Senior Topics (4)
PlPa 3-050—Forest Pathology (4)
(or) Ent 3-050—Forest Entomology
Rhet 3-562—Technical Writing (3)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (20)

TOTAL GRADUATION REQUIREMENTS

Required courses listed above (131 credits), plus additional credits to satisfy the C.L.E. requirements, plus electives sufficient to total 192 credits shall be completed for the degree.

3. FOREST PRODUCTS CURRICULUM

This curriculum is for the training of students for a broad range of career opportunities in the forest products industries. A selection of courses toward more specific professional objectives is represented in the specialized programs.

Curriculum Core Courses

FRESHMAN YEAR

Biol 1-011—General Biology (5)
Bot 1-001—General Botany (5)
Chem 1-004—General Principles (5)
Chem 1-005—General Principles (5)
FRD 1-200—Introduction to Forestry and Conservation (4)
Rhet 1-101—Freshman Communications (or pass English proficiency examination) (4)

Rhet 1-102—Freshman Communications (or pass English proficiency examination) (4)

Students with a grade of C or better in high school trigonometry are exempt from Math 1-008, Trigonometry; others must take Math 1-008

Students with a grade of C or better in high school mechanical drawing are exempt from AgEn 1-010, Technical Drawing; others must take AgEn 1-010

Total credits (32)

SOPHOMORE YEAR

ForP 1-302—Wood as a Raw Material (5)
Rhet 1-222—Public Speaking (4)

Total credits (9)

JUNIOR YEAR

ForP 3-309—Forest Products Quality Standards and Design of Wood Structures (5)
ForP 5-300—Fundamental Wood Properties I: Wood-Fluid Relationships (3)
ForP 5-301—Fundamental Wood Properties II: Physical Properties (4)
ForP 5-303—Fundamental Wood Properties IV: Wood Deterioration and Preservation (4)

Total credits (16)

SENIOR YEAR

ForP 5-304—Wood Processing I: Drying and Impregnation Technology (3)
ForP 5-305—Wood Processing II: Pulp and Paper Technology (4)
ForP 5-306—Wood Processing III: Manufacturing Analysis, Machining (3)
ForP 5-307—Wood Processing IV: Fiberboard and Particleboard Technology (3)
FRD 5-236—Senior Seminar (1)

Total credits (14)

TOTAL GRADUATION REQUIREMENTS

Required courses listed above (71 credits), plus additional credits under C.L.E. requirements, plus specialization requirements, plus electives for a total of 192 credits

Manufactured Housing Specialization

This specialization has as its objective the training for a career in the industrialized production of family housing units. The program includes selected courses in architecture, mechanics, plant design, and economics. The special concern of the program is with the efficient and effective use of wood products as engineering materials for building construction.

In addition to the core curriculum, requirements in this specialization include:

FRESHMAN YEAR

Math 1-211—Analysis I (5)
Stat 1-501—Introductory Statistics (4)

Electives and C.L.E. requirements to fulfill the overall requirements for graduation

Total required credits (41)

SOPHOMORE YEAR

Econ 1-001—Principles of Macroeconomics (4)
Econ 1-002—Principles of Microeconomics (4)
EG 1-025—Engineering Graphics (4)
Math 1-221—Analysis II (5)
Math 1-231—Analysis III (5)
Phys 1-271—General Physics (4)
Phys 1-275—General Physics Laboratory (1)
Phys 1-281—General Physics (4)
Phys 1-285—General Physics Laboratory (1)

Electives and C.L.E. requirements to fulfill the overall requirements for graduation

Total required credits (41)

JUNIOR YEAR

AEM 3-092—Statics, Mechanics of Material (4)
AEM 3-093—Mechanical Properties: Construction Materials (4)
Arch 3-061—Building Systems (5)
Arch 3-062—Building Systems (5)
IEOR 5-000—Introduction to Industrial Engineering Analysis (3)
Rhet 3-562—Technical Writing (3)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (40)

SENIOR YEAR

CE 3-600—Elementary Structural Designs (3)
ForP 5-311—Manufactured Housing Systems (4)
IEOR 5-010—Introduction to Work Analysis (4)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (25)

TOTAL GRADUATION REQUIREMENTS

Core curriculum requirements (71 credits), plus C.L.E. requirements in category IV (8 credits), plus Manufactured Housing Specialization (76 credits), plus electives (37 credits), for a total of 192 credits required for graduation

Marketing Specialization

This specialization has as its purpose the training of students to effectively market forest products. Jobs include purchasing and selling a wide variety of products such as hardwood and softwood lumber, plywood, hardboard, particleboard, etc. at both the wholesale and retail level. It also includes job opportunities in urban renewal programs, technical and industrial sales, and in sales promotion. These jobs lead to management positions and to specialized marketing and research jobs.

In addition to the core curriculum, requirements in this specialization include:

FRESHMAN YEAR

Ind 1-502—Building Construction Drafting (3)
Math 1-141—Algebra, Probability, Pre-Calculus (5)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (40)

SOPHOMORE YEAR

Acct 1-024—Principles of Accounting (3)
Acct 1-025—Principles of Accounting (3)
Econ 1-001—Principles of Macroeconomics (4)
Econ 1-002—Principles of Microeconomics (4)
Mktg 3-000—Principles of Marketing (3)
Math 1-142—Calculus (5)
Phys 1-031—General Physics (5)
Psy 1-001—General Psychology (5)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (41)

JUNIOR YEAR

BLaw 3-058—Law Contracts (3)
ForP 3-303—Forest Products Marketing (3)
QA 3-050—Quantitative Methods for Administration (5)
QA 3-054—Quantitative Methods for Administration (3)

Psy 5-751—Psychology of Advertising (3)
Rhet 3-551—Exposition (3)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (36)

SENIOR YEAR

ForP 5-356—Advanced Forest Products Marketing (3)
FRD 5-212—Forest Economics (4)
Mktg 3-095—Marketing Analysis, Research (3)
Mktg 3-096—Marketing Research II (3)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (27)

TOTAL GRADUATION REQUIREMENTS

Core curriculum requirements (71 credits), plus C.L.E. requirements in category IV (8 credits), plus Marketing Specialization (73 credits), plus electives (40 credits), for a total of 192 credits required for graduation

Pulp and Paper Specialization

This specialization is intended primarily for those students pursuing a career in the pulp and paper industry. It provides a general training in mathematics, the physical and chemical sciences, and the technology and properties of wood and fiber products. In addition to this, a special group of pulp and paper and related engineering courses are included which deal with the technology of wood pulp production and the manufacture of paper and other fiber products.

In addition to the core curriculum, requirements in this specialization include:

FRESHMAN YEAR

Chem 1-006—Principles of Solution Chemistry (4)
Math 1-211—Analysis I (5)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (41)

SOPHOMORE YEAR

AgEc 1-020—Principles of Macroeconomics (5)
Chem 3-301—Elementary Organic Chemistry (5)
Chem 3-302—Elementary Organic Chemistry (5)
Math 1-221—Analysis II (5)
Math 1-231—Analysis III (5)
Phys 1-271, 1-275—General Physics and Laboratory (5)
Phys 1-281, 1-285—General Physics and Laboratory (5)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (44)

JUNIOR YEAR

AEM 3-092—Statics, Mechanics of Material (4)
Chem 3-100—Quantitative Analysis (3)
Chem 3-101—Quantitative Analysis Laboratory (2)
Chem 5-520—Elementary Physical Chemistry (3)
ForP 5-302—Fundamental Wood Properties III: Wood Chemistry (3)
Rhet 3-562—Scientific Technical Writing (3)
Stat 1-051—Introduction: Ideas of Statistics (4)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (38)

SENIOR YEAR

ForP 5-310—Advanced Pulp and Paper Technology (4)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (18)

TOTAL GRADUATION REQUIREMENTS

Core curriculum requirements (71 credits), plus C.L.E. requirements in categories III and IV (11 credits), plus Pulp and Paper Specialization (70 credits), plus electives (40 credits)** for a total of 192 credits required for graduation

Wood Science and Technology Specialization

This specialization is for those desiring broad and general training in the field. It allows more latitude in selection of elective subjects as a complement of the basic training in physical sciences, the fundamental properties of wood, and the technology of wood products manufacturing.

In addition to the core curriculum, requirements in this specialization include:

FRESHMAN YEAR

Chem 1-006—Solution Chemistry (4)
Math 1-211—Analysis I (5)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (41)

SOPHOMORE YEAR

AgEc 1-020—Principles of Macroeconomics (5)
Chem 3-301—Elementary Organic Chemistry (5)
Chem 3-302—Elementary Organic Chemistry (5)
Math 1-221—Analysis II (5)
Math 1-231—Analysis III (5)
Phys 1-271—General Physics (4)
Phys 1-275—General Physics Laboratory (1)
Phys 1-281—General Physics (4)
Phys 1-285—General Physics Laboratory (1)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (44)

JUNIOR YEAR

AEM 3-092—Statics, Mechanics of Material (4)
Chem 3-100—Quantitative Analysis (3)
Chem 3-101—Quantitative Analysis Laboratory (2)
Chem 5-520—Elementary Physical Chemistry (3)
ForP 5-302—Fundamental Wood Properties III: Wood Chemistry (3)
Rhet 3-562—Technical Writing (3)
Stat 1-051—Introduction to Statistics (4)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (38)

** Of the 40 elective credits, at least 15 must be taken in one of the five following collateral areas after consultation with and approval of the adviser: (a) sanitary engineering, (b) chemical engineering, (c) industrial engineering, (d) mechanical engineering, (e) chemistry.

SENIOR YEAR

Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total Forest Products core curriculum courses (14 credits)

TOTAL GRADUATION REQUIREMENTS

Core curriculum requirements (71 credits), plus C.L.E. requirements in categories III and IV (11 credits), plus Wood Science and Technology Specialization (66 credits), plus electives (44 credits) for a total of 192 credits required for graduation

4. RECREATION RESOURCE MANAGEMENT CURRICULUM

This curriculum does not contain the traditional forestry core of courses. The student electing this program will not qualify as a forester under present Federal Civil Service regulations or for membership in the Society of American Foresters. General objectives of the program are:

1. To educate recreation resource specialists for broad recreation resource planning and management involving land and water areas.
2. To provide necessary background for participation in expanding regional, state, and federal resource-oriented recreation programs as well as for private planning consultant employment.
3. To prepare students for graduate work in resource planning and management through forestry, agricultural economics, and other fields of study.

While this undergraduate program may be terminal for some, primarily it should attract students motivated toward and capable of graduate work. This is an interdisciplinary program administered by the College of Forestry with the assistance of special college committees.

FRESHMAN YEAR

Biol 1-011—General Biology (5)
Bot 1-001—General Botany (5)
Chem 1-004—General Principles (5)
Chem 1-005—General Principles (5)
FRD 1-201—Conservation of Natural Resources (3)
Geo 1-001—Physical Geology (5)
Geog 1-301—Human Geography (5)
(or) Geog 1-401—Physical Geography
Math 1-141—Algebra, Probability, Pre-Calculus (5)
Rhet 1-101—Freshman Communications (or pass English proficiency examination) (4)
Rhet 1-102—Freshman Communications (or pass English proficiency examination) (4)
Students with a grade of C or better in high school mechanical drawing are exempt from AgEn 1-010, Technical Drawing; others must take AgEn 1-010
Students with a grade of C or better in high school trigonometry are exempt from Math 1-008, Trigonometry; others must take Math 1-008
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (46)

SOPHOMORE YEAR

AgEc 1-020—Principles of Macroeconomics (5)
AgEc 1-030—Principles of Microeconomics (4)
Ecol 3-004—Fundamentals of Ecology (3)
FBio 1-100—Dendrology (4)

Hort 1-022—Woody Plant Materials (3)
Hort 1-024—Theory of Landscape Design (3)
Math 1-142—Calculus (5)
Phys 1-031—General Physics** (5)
Phys 1-032—General Physics** (5)
Rhet 1-222—Public Speaking (4)
Soc 1-001—Man in Modern Society (4)
Soc 1-002—American Community (4)
(or) Pol 1-041—Contemporary Political Ideology
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (49)

JUNIOR YEAR

AgEn 1-400—Surveying (4)
AgEn 3-410—Hydrology, Water Control (4)
FRD 5-232—Management of Recreational Lands (3)
FW 3-050—Principles of Fisheries and Wildlife Management (3)
Psy 1-001—General Psychology (5)
Rec 1-520—Orientation to Leisure and Recreation (5)
(or) Rec 5-130—Recreation in Park Areas and Facilities
(or) Rec 5-156—Principles and Practices of Recreation
Rhet 3-551—Exposition (3)
(or) Rhet 3-562—Technical Writing
Rhet 3-254—Advanced Public Speaking (4)
(or) Rhet 3-256—Discussion Methods
Soil 1-122—Introduction to Soil Science (4)
Stat 5-021—Statistical Analysis I (4)
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (39)

SENIOR YEAR

AgEc 3-610—Community Resources Development (4)
Ecol 5-014—Plant Communities (5)
FRD 5-200—Aerial Photo Interpretation (3)
FRD 5-233—Principles of Recreation Planning and Design (4)
FRD 5-259—Recreation Land Amenities and the User (3)
(or) FRD 5-257—Recreation Land Policy
RCD 5-100—Resources and Community Development Seminars (3)
RCD 5-101—Resources and Community Development Seminars (4)
Soc 5-201—Social Psychology (4)
(or) Soc 5-401—Social Organization
(or) Soc 5-651—Rural Social Institutions
Electives and C.L.E. requirements to fulfill the overall requirements for graduation
Total required credits (30)
Suggested electives: Consult adviser (20 credits)

TOTAL GRADUATION REQUIREMENTS

Required courses listed above (164 credits), plus additional credits to satisfy the C.L.E. requirements, plus electives sufficient to total 192 credits shall be completed for the degree

C. 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 College of Forestry.

** Phys 1-010, 1-015, 1-020, 1-025, 1-030, 1-035 (12 credits) can also be used to fulfill the physics requirements

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, economics, administration, measurements, aerial photogrammetry, genetics, watershed management, physiology, ecology, recreation, marketing, construction, and forest products engineering. Graduates interested in these programs should consult the *Graduate School Bulletin* for details, and requests for information and admission should be directed to the Graduate School, University of Minnesota, Minneapolis, Minnesota 55455.

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. Graduates from nonforestry curricula may be eligible for this program provided minimum course background in related areas has been acquired.

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 interested in the master of forestry program should consult the *Graduate School Bulletin* (master of science—Plan B) for details of requirements and should make application for admission with the Graduate School, University of Minnesota, Minneapolis, Minnesota 55455.

COLLEGE OF FORESTRY FACULTY

Professor

Frank H. Kaufert, Ph.D., *Dean*
Egolfs V. Bakuzis, Ph.D.
Bruce A. Brown, Ph.D.
David W. French, Ph.D.[1]
Henry L. Hansen, Ph.D.
John G. Haygreen, Ph.D.
Ralph L. Hossfeld, Ph.D.
Jay M. Hughes, Ph.D.
Frank D. Irving, Ph.D.
Hugo H. John, Ph.D.
Lawrence C. Merriam, Jr., Ph.D.
Merle P. Meyer, Ph.D.
Richard A. Skok, Ph.D.
Edward I. Sucoff, Ph.D.
Kenneth E. Winsness, M.F.

Professor Emeritus

J. H. Allison, M.F.
R. M. Brown, M.F.

Associate Professor

Robert W. Erickson, Ph.D.
Roland O. Gertjejansen, Ph.D.
Alvin R. Hallgren, Ph.D.
Lewis T. Hendricks, Ph.D.[2]
Herbert M. Kulman, Ph.D.[3]
Arnett C. Mace, Jr., Ph.D.
William R. Miles, Ph.D.[2]
Marvin E. Smith, B.S.[2]
Robert D. Thompson, M.S.

Assistant Professor

Alvin A. Alm, Ph.D.
Douglas J. Gerrard, Ph.D.
David F. Grigal, Ph.D.[4]
Timothy B. Knopp, Ph.D.
Harold Scholten, Ph.D.
John C. Tappeiner II, Ph.D.
Joseph J. Ulliman, Ph.D.

Instructor

James L. Bowyer, M.S.
Frederic J. Hill, M.S.
Rodney W. Sando, M.S.

[1] Associate member from Department of Plant Pathology
[2] Associate members from Cooperative Agricultural Extension Service
[3] Associate member from Department of Entomology, Fisheries, and Wildlife
[4] Associate member from Department of Soil Science

Research Associates

Clifford E. Ahlgren, M.S.[5]
Vilis Kurmis, Ph.D.
Laurits W. Krefting, M.S.[6]
Zigmond A. Zasada, B.S.

Research Fellow

William D. Brakel, M.S.
William E. Johns, M.S
Robert P. Latham, M.S.

Associate Scientist

Raymond Jensen, B.S.

[5] Director of Quetico-Superior Wilderness Research Center
[6] Associate member from Bureau of Sports, Fisheries, and Wildlife

SECTION 4

COURSE DESCRIPTIONS

Forest Biology (FBio)

1-100. DENDROLOGY. (4 cr; prereq Biol 1-011)
Identification, nomenclature, classification, and distribution of about 200 important forest trees. Includes the preparation and use of keys, systems of natural classification, and field and laboratory methods of identification.

1-101. INTRODUCTION TO AIR AND WATER QUALITY. (4 cr; prereq Biol 1-011, Chem 1-005 or ‡)
Presents an overall view and an appreciation of air and water quality problems. Basic processes which govern the acretion, depletion, and cycles of specific types and sources of pollution. Methods of pollution abatement and assessment of the influence of political, social, and economic pressures on the maintenance of a "quality environment."

3-100. IMPORTANT FOREST PLANTS. (2 cr; prereq Bot 1-001; given at Itasca)
Identification of forest plants as related to forest types.

3-101. FOREST ECOLOGY. (3 cr; prereq college physics; given at Itasca)
Ecological principles. Silvical characteristics of tree and shrub species. Forest communities and environmental factors.

3-114. FOREST TREE BIOLOGY. (4 cr; prereq Chem 1-004, 10 cr of biology)
The genetics, growth, function, and autecology of forest trees; biology of trees in stands.

5-100. SILVICULTURE. (4 cr; prereq 1-100, 3-101, Soil 1-122 or ‡)
Introduction to the silvicultural systems, intermediate cuttings, and related practices. Forest regeneration problems and techniques.

5-101. FIELD SILVICULTURE. (5 cr; prereq 5-100; given at Cloquet)
Lectures and field work in relation to timber stand improvement projects, stand examinations and prescriptions, seeding and planting, and related silvicultural practices.

5-102. REGIONAL SILVICULTURE. (3 cr; prereq 5-100 or ‡)
Forest regions of North America emphasizing silvical, historical, geographic, economic, and other determinants of forest management. Topics and field trips on special problems of current forestry concern.

5-103. ADVANCED FOREST TREE BIOLOGY. (3 cr; prereq ‡)
Treatment of current applications and research in forest tree biology.

5-115. FOREST BIOLOGY SEMINAR. (1 cr; prereq grad, or 5-401, or ‡)
Presentation of research proposals, plans, progress, and results.

5-150. PRINCIPLES OF SILVICS. (3 cr; prereq sr, 5-101, 5-100, or ‡)
Survey of classical concepts and contemporary developments in ecology as related to forestry. Discussion group format.

5-151. MULTIPLE-USE SILVICULTURE. (3 cr; prereq sr, 5-100, or ‡)
The ecomanagement of forest areas with special emphasis on aesthetic, wildlife, and other nontimber values.

5-152. FOREST GENETICS. (3 cr; prereq ‡)
Heredity and variation of important forest-tree species; applications of genetic principles in tree improvement.

5-401. SENIOR TOPICS. (Cr ar; prereq sr)
Independent study in a field of direct interest to a senior forest science major or to other seniors with a 3.00 GPA. Work to be systematically planned with student's adviser.

FOR GRADUATE STUDENTS ONLY

8-100. RESEARCH PROBLEMS: SILVICULTURE
8-101. RESEARCH PROBLEMS: FOREST-TREE PHYSIOLOGY
8-102. RESEARCH PROBLEMS: FOREST-TREE GENETICS
8-103. RESEARCH PROBLEMS: FOREST HYDROLOGY
8-104. FOREST ECOSYSTEMS

Forest Products (ForP)

1-301. WOOD AS A RAW MATERIAL. (4 cr; prereq Bot 1-001)
The nature of wood as a raw material for the major forest products industries. The physical and chemical nature of both solid wood and wood fibers as this relates to the requirements of major wood-based industries. The world supply and consumption picture. Weekly demonstrations of the manufacture of solid, particle, and fiber products.

1-302. WOOD AS A RAW MATERIAL. (5 cr; prereq Bot 1-001)
Same content as ForP 1-301. Laboratory dealing with details of wood structure will also be held.

3-303. FOREST PRODUCTS MARKETING. (3 cr; prereq Mktg 3-000)
Historical and current considerations of forest products marketing at the manufacturing, wholesale, and retail levels. Lectures, guest speakers, and field trips.

3-309. FOREST PRODUCTS QUALITY STANDARDS AND DESIGN OF WOOD STRUCTURES. (5 cr; prereq 1-302, Ind 1-502)
Definition of quality standards for forest products together with industry practices and customs for the buying and selling of the major forest products. Considerations of quality in the design of structure using forest products. The use of industry strength and design data tables for construction of simple wood structures.

5-300. FUNDAMENTAL WOOD PROPERTIES I: WOOD FLUID RELATIONS. (3 cr; prereq 1-302)
Discussion of wood permeability and fluid movement above and below the fiber saturation point. Adsorption, hysteresis, swelling, and dimensional stabilization.

5-301. FUNDAMENTAL WOOD PROPERTIES II: PHYSICAL PROPERTIES. (4 cr; prereq 5-300)
Strength, time-strain relationships, heat transfer, and electrical properties. Lectures and demonstrations.

5-302. FUNDAMENTAL WOOD PROPERTIES III: WOOD CHEMISTRY. (3 cr; prereq Chem 3-301, 3-302)
Chemical composition, reactions, and analysis of wood, wood components, and derivatives.

5-303. FUNDAMENTAL WOOD PROPERTIES IV: WOOD DETERIORATION AND PRESERVATION. (4 cr; prereq 1-301)
Study of deterioration of wood and wood products by bacteria, fungi, insects, marine organisms, fire, and weathering; methods of preservation and preservatives used. Lectures and laboratory.

5-304. WOOD PROCESSING I: DRYING AND IMPREGNATION TECHNOLOGY. (3 cr; prereq 5-300, 5-303 or ‡)
Air drying, kiln drying, and specialized drying techniques. Treatment of wood for increased decay, fire, and weather resistance. Laboratory

5-305. WOOD PROCESSING II: PULP AND PAPER TECHNOLOGY. (4 cr; prereq 5-300, 5-301 or ‡)
Pulping processes; fiber refining and processing; manufacture of paper; fiber and paper properties; recycling of paper; and water intake and effluent treatment. Lecture and laboratory. Field trip optional.

5-306. WOOD PROCESSING III: MANUFACTURING PROCESSES. (3 cr; prereq 1-301)
Manufacturing of wood-based products considered from systems point of view. Input requirements, machinery selection, methods of economic comparison. Field trip required.

5-307. WOOD PROCESSING IV: FIBERBOARD AND PARTICLEBOARD TECHNOLOGY. (3 cr; prereq 5-305)
Design, manufacture, properties, and applications of fiberboards and particleboards. Adhesives and their application in the board industry. Lecture, laboratory, and a research project.

5-310. ADVANCED PULP AND PAPER TECHNOLOGY. (4 cr; prereq 5-305)
Refiner action and fiber morphology; rheological properties of wet webs and paper; chemistry of internal additives; coating technology. Lecture and laboratory.

5-311. MANUFACTURED HOUSING SYSTEMS. (4 cr; prereq ‡)
Development and principles of manufactured housing systems. Analysis of wood-frame construction technology. Strength and related properties of wood and wood-based materials as related to design. Material and design optimization. Analysis of plant layouts.

5-350. WOODY TISSUE MICROTECHNIQUE. (2 cr; prereq 1-302)
Use of sliding and rotary microtomes, hand sectioning, maceration, differential staining, and special techniques in preparation of woody tissue for microscopic study. Laboratory.

5-351. MOISTURE RELATIONS IN WOOD. (3 cr; prereq 5-300)
Study of moisture movement in wood related to the microphysical and chemical structure and its influence on the development of stress during drying and subsequent use.

5-352. ADVANCED WOOD PRESERVATION. (3 cr; prereq 5-303, 5-304)
Study of factors governing toxicity, permanence, and effectiveness of wood preservatives to fungi, insects, and marine borers. Study of fire retardant and treatments. The permeability of wood, penetration of preservatives, and heat transfer.

5-353. ADVANCED WOOD CHEMISTRY. (2 cr; prereq 5-302, Chem 3-100, 3-101 or equiv; offered when feasible)
Laboratory problems in the analysis of wood constituents and in the techniques of their isolation and purification.

5-355. MECHANICAL BEHAVIOR OF WOOD. (3 cr; prereq AEM 1-015, 3-016)
Orthotropic nature of wood; elastic and inelastic behavior; effect of moisture, temperature, and time. Some consideration of plywood, particleboard, and fiberboard properties.

5-356. ADVANCED FOREST PRODUCTS MARKETING. (3 cr; prereq 3-303)
Lectures and case studies of retail, wholesale manufacture, and market analysis research of forest products business.

5-358. PULP AND PAPER TECHNOLOGY: SPECIAL TOPICS. (2 cr; prereq 5-310 or ‡)
Laboratory problems in the properties of wood fiber, paper, and paper products.

5-401. SENIOR TOPICS. (Cr ar; prereq sr)
Independent study in a field of direct interest to a senior forest science major or to other seniors with a 3.00 GPA. Work to be systematically planned with the student's adviser

FOR GRADUATE STUDENTS ONLY

8-300. RESEARCH PROBLEMS: FOREST PRODUCTS ENGINEERING
8-301. RESEARCH PROBLEMS: FOREST UTILIZATION

Forest Resources Development (FRD)

1-200. INTRODUCTION TO FORESTRY AND CONSERVATION. (4 cr; for forestry majors only; prereq fr, soph, or ‡)
Provides the incoming forestry students with an understanding and awareness of what forestry is and how it relates to and interacts with the conservation of natural resources in general. The history of forestry and conservation with emphasis on the impact of changing philosophies on natural resource use. The forests are given primary consideration, but the renewable resources as a whole are examined both from a biological and economic point of view.

1-201. CONSERVATION OF NATURAL RESOURCES. (3 cr)
Renewable natural resources of the United States 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. Lectures and reports.

1-202. SMALL WOODLANDS FORESTRY. (3 cr; prereq Biol 1-011 or ♯)
Tree identification. Care of woodlots. Establishment and maintenance of windbreaks, shelterbelts, Christmas trees, and erosion control plantings. Measuring, marketing, and use of wood on the farm. Lectures and laboratory.

3-201. FIELD FOREST MEASUREMENTS. (1 cr; prereq Math 1-008; given at Itasca)
Introduction to and use of instruments in forest mensuration.

3-202. FOREST MENSURATION. (3 cr; prereq Itasca session, Math 1-111)
Measurement of stand variables, forest products, forest growth and yield. Use of volume and yield tables. Elementary statistics. Lectures and laboratory.

5-090. INTRODUCTION TO RESEARCH. (3 cr; prereq sr or ♯)
Research philosophy, objectives, problem development, analytical principles, and presentation, illustrated by situations in forestry.

5-200. AERIAL PHOTO INTERPRETATION. (3 cr; prereq 3-202 or ♯)
Use of aerial photographs; preparation of planimetric and vegetative type maps. Photo interpretation and application to resource management. Lectures and laboratory.

5-201. STATISTICAL METHODS IN FORESTRY. (4 cr; prereq 3-202, ¶5-200, or ♯)
Sampling, decision making using statistical tests, application of statistics to forest survey, inventory, and volume table selection. Lectures and laboratory.

5-202. FOREST INVENTORY AND PHOTOGRAPHIC INTERPRETATION. (4 cr; prereq 3-202, 5-200, 5-201, AgEn 1-400; given at Cloquet)
Type delineation, area measurement, map construction, cruise design, and timber measurement using aerial photos.

5-210. MULTIPLE USE. (5 cr; prereq AgEc 1-020; given at Cloquet)
Elements and interrelationships of forest administration, management, utilization, engineering, hydrology, and recreation. Lectures, field trips, and problems.

5-212. FOREST ECONOMICS. (4 cr; prereq AgEc 1-020 or ♯)
An examination of the United States and world forest resource supply and consumption relationships; forest products industries and wood products users characteristics; aggregate and firm capital use theory for long period production processes; market systems for principal forest products; macro problems of the forest economy; and decision making in micro forest economic situations.

5-213. FOREST MANAGEMENT AND ADMINISTRATION. (5 cr; prereq 5-201, 5-212, ¶FBio 5-100 or ♯)
Inventory, regulation, and continuous production of timber. Economic analysis production problems. Organization and administration of forestry enterprises.

5-230. FOREST FIRE. (2 cr; prereq FBio 1-100 or ♯)
Fire behavior, effects, control, and use.

5-231. RANGE MANAGEMENT. (4 cr; prereq 5-237, Biol 1-011, or ♯)
Grazing animal production on forest and open range lands; relationship to other land uses.

5-232. MANAGEMENT OF RECREATIONAL LANDS. (3 cr)
Recreational use of the forest and associated land and water. Policy problems arising from recreational demands.

5-233. PRINCIPLES OF OUTDOOR RECREATION DESIGN AND PLANNING. (4 cr; prereq 5-232)
(Same as Hort 5-010) For advanced students associated with design, management, and planning of recreation facilities. Planning and design principles related to recreational land use and development; parks, campsites, water areas, highways, summer and winter recreational facilities.

5-234. FOREST PROTECTION. (2 cr; prereq 5-230 or ♯; given at Cloquet)
Field exercises in the behavior, effects, control, and use of fire. Identification and ecology of forest disease and insect problems.

5-236. SENIOR SEMINAR. (1 cr; prereq sr, Rhet 1-222)
Discussions and presentation of papers on forestry problems, work experience, employment opportunities.

5-237. FOREST METEOROLOGY AND HYDROLOGY. (4 cr; prereq Itasca session, Soil 1-122, Geo 1-001, or ‡)
Analysis of effects of climate on the forest ecosystem and components of the hydrologic cycle. Principles of managing the forest system including effects of climate and vegetation on soil moisture, timing of runoff, and water quantity and quality.

5-238. TIMBER HARVESTING. (2 cr; prereq jr, sr, or ‡)
Principles and general methods of logging in the different forest regions of the United States, and the modifications required by forest management.

5-250. FOREST POLICY. (3 cr; prereq sr or ‡)
Public and private forest policies in the United States. Forest policies of other nations. Analysis of current policy issues. Lectures and reports.

5-251. ADVANCED FOREST ECONOMICS. (3 cr; prereq 5-212 or ‡)
Economics of forest resource development and forest products.

5-252. REMOTE SENSING OF NATURAL RESOURCES. (4 cr; prereq sr, 5-200 or ‡; offered 1972-73 and alt yrs)
Photogrammetric systems, flight planning, contracting, contract inspection; advanced photo interpretation, mapping and measurement problems. Laboratory.

5-253. ADVANCED FOREST MENSURATION. (3 cr; prereq 5-201, Biom 5-011 or ‡)
Applications of statistical and advanced mensurational methods in the analysis and interpretation of forestry data and forest survey sampling methods. Lectures and laboratory.

5-254. ADVANCED FOREST MANAGEMENT AND ADMINISTRATION. (3 cr; prereq sr or ‡; offered 1972-73 and alt yrs)
Traditional and contemporary forest management concepts and practices. Administrative science applications in technical organizations concerned with forest land management

5-255. ADVANCED FOREST HYDROLOGY. (3 cr; prereq 5-237 or ‡)
A study of the recent literature relating to management of the forested watershed. Methods of analyzing research data.

5-256. PLANNING, CONTROL IN FORESTRY. (3 cr; prereq sr, 5-212, 5-213, or ‡; offered 1973-74 and alt yrs)
Analysis of forest management objectives and their relationship to forestry planning concepts, including systems analysis, and the control of significant biological and economic variables in forest production alternatives.

5-257. RECREATIONAL LAND POLICY. (3 cr; prereq 5-232 or ‡)
Discussion and analysis of policy issue affecting the use and management of lands devoted entirely or in part to recreational objectives.

5-258. OUTDOOR RECREATION ECONOMICS. (3 cr; prereq 5-232, 5-257, AgEc 1-020, or ‡)
The role of economic analysis in outdoor recreation; analysis of alternative methodologies for valuation and choice problems, including both supply and demand aspects; discussion and analysis of major trends and issues. Lectures, readings, discussions, reports.

5-259. RECREATION LAND AMENITIES AND THE USER. (3 cr; prereq 5-232 and ‡)
Concepts and management of parks, forests, and other recreation areas for recreation visitors. The role of interpretive education, user preference in relation to administrative objectives. Principles of area management, individual and group influences. Lecture, discussion, reports, reading.

5-260. ADVANCED MANAGEMENT OF RECREATIONAL LANDS. (3 cr; prereq 5-232, Ecol 3-004 or ‡)
Discussion of relationship of man as recreationist to the natural environment. Principles of manipulation of plant and animal communities for outdoor recreation objectives. Lectures, reading, discussion, reports. Field trips.

5-261. FORESTRY AND ECONOMIC DEVELOPMENT. (3 cr; prereq sr or grad, 5-212 or ‡)
The role of forestry and forest industries in economic development through the application of economic theory and through case studies with emphasis on the low income

countries of the world. Sector programming and project planning techniques as they relate to forestry development.

5-401. SENIOR TOPICS. (Cr ar; prereq sr)
Independent study in a field of direct interest to a senior forest science major or to other seniors with a 3.00 GPA. Work to be systematically planned with the student's adviser.

FOR GRADUATE STUDENTS ONLY

8-200. RESEARCH PROBLEMS: FOREST MANAGEMENT
8-201. RESEARCH PROBLEMS: FOREST ECONOMICS
8-202. RESEARCH PROBLEMS: FOREST MEASUREMENTS
8-203. RESEARCH PROBLEMS: FOREST RECREATION
8-204. RESEARCH PROBLEMS: FOREST POLICY
8-205. RESEARCH PROBLEMS: REMOTE SENSING AND PHOTOGRAMMETRY

SECTION 5

GENERAL INFORMATION

Student Personnel Services

Student Scholastic Standing Committee—Almost every student on occasion makes use of the Student Scholastic Standing Committee in the College of Forestry. This is a committee of the faculty which interprets and enforces faculty regulations. It also may 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 call at the College Office. By means of petition, the forms for which are procured in the College Office, 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, 10 Green Hall.

If you transfer from another institution to the College of Forestry, your transfer credits are evaluated in the Office of Admissions and Records. You should go to the College Office, 10 Green Hall, if you have any questions about the use of transfer credits. If necessary, you will be referred to the chairman of the Student Scholastic Standing Committee, which makes final decisions in evaluating transfer credits in terms of this college and the requirements of the various curricula.

College Placement Services—The College of Forestry assists students in locating summer forestry work while in residence and permanent positions following graduation. The placement directors are in 110J Green Hall and 202 Forest Products Building. They will bring job opportunities to the attention of students and assist in arranging interviews with employer representatives.

Student Government

St. Paul Campus Board of Colleges—The St. Paul Campus Board of Colleges directs and coordinates student activities and encourages student leadership throughout the St. Paul Campus. Its membership is drawn from all major areas of the College of Agriculture, College of Forestry, College of Home Economics, College of Veterinary Medicine, and College of Biological Sciences.

The Board cooperates with the Minnesota Student Association (MSA) and the Senate Committee on Student Affairs. It brings questions from the student body to the administration of the colleges 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 the College of Forestry 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 examination.

If you 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 instructor or a member of the Honor Case Commission. The Honor Case Commission, comprised of students from the various areas, considers confidentially the various aspects of the situations reported. If it is clear that scholastic dishonesty has occurred, the commission recommends to the Student Scholastic Standing Committee of the faculty an appropriate action to be taken with respect to the offending student.

The honor system is essentially a preventive rather than a punitive system and provides for greater freedom of action on the part of students on this campus. 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 on the bulletin board at 10 Green Hall together with a notice as to how members may be contacted for information or assistance.

Student-Faculty Board—The Student-Faculty Board of the College of Forestry is intended to be a consultative, problem defining, and a referral group intended to provide a focal point for student and faculty concerns within the educational process of the College of Forestry. The board is composed of administration, faculty members, graduate students, and undergraduate students of the College of Forestry so that a broad base of reference from within the College of Forestry is readily available to deal with problems of mutual concern. For further details, please contact the director of undergraduate programs in the College Office, 10 Green Hall.

Student Center Board of Governors—The St. Paul Campus Student Center provides a rich program of social, cultural, and recreational activities and contributes in many ways to the educational objectives of the campus. Student participation in this varied program is encouraged. An elected board, the St. Paul Campus Student Center Board of Governors, made up of students representing the various academic units on the St. Paul Campus, formulates policy for operation of the Student Center and establishes its budget. Students wishing information about the Student Center, its operation, and opportunities to serve on the various planning and programming committees should inquire at the Information Desk, first floor of the Student Center.

Reserve Officers' Training Corps

The ROTC through its three services—Army, Navy, and Air Force—gives college students an opportunity to combine military or naval training with their academic work. Students are eligible for ROTC enrollment if they are registered in academic courses leading toward degrees, if they are United States citizens, and if they meet physical and other qualifications. The general requirements of the three services and their special characteristics are described in the *Army-Navy-*

Air Force ROTC Bulletin. Also you may make inquiries personally or by letter at the following offices in the University Armory: Military Science, room 108; Naval Science, room 203; Aerospace Studies, room 3.

Scholarships and Awards

Financial aid to students includes: (a) various scholarships supported by gifts from alumni, foundations, industry, and friends of the University and College of Forestry; (b) grants, such as the Educational Opportunity Grants, and the Regents Student Aid Fund; (c) loans from the National Defense Student Loan Program and the University Trust Fund Loan; and (d) the College Work-Study Program. One application insures consideration for all of these types of financial assistance including those scholarships specific to the College of Forestry.

Submit all applications for financial aid to the Office of Student Financial Aid, 107 Armory, University of Minnesota, Minneapolis, Minnesota 55455 or 190 Coffey Hall, University of Minnesota, St. Paul, Minnesota 55101. Application forms are available at the principal's or counselor's office of your high school or the Student Financial Aid offices listed above. Financial aid information is sent to all Minnesota high schools in the early October of each year, and prospective students should consult with their high school principal or counselor at that time.

The University of Minnesota financial aid program is coordinated through the College Scholarship Service; consequently the parents of each applicant must submit the Parents' Confidential Statement.

Applications from entering freshmen for aid the fall quarter should be submitted by December 15 prior, and the applicant will be notified of the outcome by April 1. Students presently enrolled in the College of Forestry and transfer students should submit applications by April 1 for notification by August 1.

Unless otherwise specified, selection of recipients for scholarships is based upon academic aptitude, vocational promise, personal attributes, leadership, and financial need.

Institute of Agriculture Scholarships and Awards

ALPHA GAMMA RHO (LAMBDA CHAPTER) SCHOLARSHIP—To assist active members of Alpha Gamma Rho, Lambda Chapter.

ALPHA ZETA TRAVELING SCHOLARSHIPS—To assist junior and senior students of high scholarship and strong professional interests to attend a meeting of an appropriate professional, scientific, or technical society or association.

UNIVERSITY OF MINNESOTA MEMORIAL FUND SCHOLARSHIP—Preference given to children of deceased staff members of the University of Minnesota.

College of Forestry Scholarships and Awards

MARY DWIGHT AKERS LOAN FUND

Sponsor: Unknown

Basis of Award: Limited loans as needed and approved by the dean

CAROLIND SCHOLARSHIP

Sponsor: Dr. Ralph M. Lindgren, St. Paul, Minnesota

Basis of Award: Established to provide financial assistance to deserving and outstanding undergraduate students in the College of Forestry on the basis of academic aptitude, vocational promise, personal attributes, leadership, and need

E. G. CHEYNEY MEMORIAL SCHOLARSHIPS

Sponsor: The Minnesota Forestry Alumni Association

Basis of Award: Scholarships open to junior or senior students who have demonstrated outstanding ability and improvement in creative writing and speaking skills

CALEB DORR SCHOLARSHIPS

Sponsor: Caleb D. Dorr Fund

Basis of Award: Cash and book awards made annually to the forestry student in each class with the highest grade point average

E. A. EVERETT MEMORIAL SCHOLARSHIP

Sponsor: The late Edward A. Everett

Basis of Award: Awarded to Upper Division forestry students on the basis of financial need, acceptable scholarship, and professional promise

FEDERATED GARDEN CLUBS OF MINNESOTA SCHOLARSHIPS

Sponsor: Federated Garden Clubs of Minnesota

Basis of Award: Awarded to students in forestry on the basis of academic aptitude, vocational promise, personal attributes, leadership, and financial need

HENRY SCHMITZ FOREST PRODUCTS ENGINEERING

Sponsor: Dr. Stanley J. and Mertie W. Buckman, Memphis, Tennessee

Basis of Award: Awarded to a deserving and promising student entering the manufactured housing, pulp and paper, or wood science and technology specializations of the Forest Products curriculum

FOREST PRODUCTS MARKETING SCHOLARSHIPS

Sponsor: Twin Cities Hoo Hoo Club No. 12 and the Thomas Murdock Partridge Memorial Fund

Basis of Award: Awarded to deserving and promising students entering the Forest Products curriculum, Marketing Specialization of the College of Forestry

COLLEGE OF FORESTRY SCHOLARSHIP PROGRAM

Sponsor: Gifts from alumni of the College of Forestry

Basis of Award: For occasional small grants to especially needy and worthy students

ROBERT L. GOUDY MEMORIAL SCHOLARSHIP FUND

Sponsor: Mr. and Mrs. F. X. Corbett, Georgetown, Colorado

Basis of Award: Awarded to outstanding transfer students on the basis of academic ability, vocational promise, extracurricular activities, personality, and financial need

SAMUEL B. GREEN SCHOLARSHIP MEDAL

Sponsor: The late Mrs. Samuel B. Green in memory of her husband who established the College of Forestry in 1903 and directed it until 1910

Basis of Award: Awarded to the senior in forestry having the highest scholastic average at the end of the fall quarter

HOMELITE FORESTRY SCHOLARSHIPS

Sponsor: Homelite, Division of Textron, Inc., Port Chester, New York

Basis of Award: Awarded to juniors or seniors in forestry on the basis of academic achievement, leadership, vocational promise, and character

HENRY SCHMITZ MEMORIAL SCHOLARSHIP FUND

Sponsor: Gifts from alumni of the College of Forestry

Basis of Award: For occasional small grants to take care of special emergency needs

AUGUSTUS L. SEARLE SCHOLARSHIP

Sponsor: Augustus L. Searle

Basis of Award: To women in the College of Forestry with preference to Minnesota residents

HELEN A. YOUNG MEMORIAL SCHOLARSHIP

Sponsor: Mr. John Young, Rochester, Minnesota

Basis of Award: To assist qualified, competent, and needy students to initiate and complete their forestry education

SECTION 6

RELATED DEPARTMENTAL COURSES

Listed below are courses which are either a part of the core curriculum of the various curricula in the College of Forestry or are courses which are not in the core curriculum but are recommended for students under special conditions.

Entomology (Ent)

5-050. FOREST ENTOMOLOGY. (4 cr; prereq forestry major or ♯)
Lectures and laboratory concerning ecology and population management of forest insects with heavy emphasis on tree factors and biological control.

Fisheries and Wildlife (FW)

3-050. PRINCIPLES OF FISHERIES AND WILDLIFE MANAGEMENT. (3 cr, §5-451, §5-551; for non-FW majors; prereq Biol 1-002 or equiv, Biol 3-041 or For 3-101, or Ecol 3-001)
Introduction to fishery and wildlife population ecology; relations between fish and wildlife and their environments; management of fish and game populations and habitats; management and research methods; administration of fish and wildlife agencies.

3-167. TECHNIQUES OF FOREST WILDLIFE MANAGEMENT. (2 cr; prereq 3-050; given at Cloquet)
Biology and management of important forest wildlife species; methods of evaluating forest wildlife populations and habitats.

3-277. MAMMALOGY. (5 cr; prereq VAna 1-120)
Distinguishing characteristics and life histories of the various mammal groups, particularly those represented in the state

Plant Pathology (PlPa)

3-050. FOREST PATHOLOGY. (4 cr, §1-001; prereq 6 cr in botany or Biol 1-002)
Diseases of forest and shade trees; wood decay. Symptoms, etiology, and control. Lectures, laboratory, and field work.

5-051. ADVANCED FOREST PATHOLOGY. (3 cr; prereq 3-050 or equiv; offered 1972-73 and alt yrs)
Basic concepts in the etiology, epidemiology, and pathogenesis of tree diseases and wood deterioration.

Rhetoric (Rhet)

All students in the College of Forestry are required to take the following courses in rhetoric: Freshman Communication (Rhet 1-101 and Rhet 1-102); Public Speaking (Rhet 1-222); and Professional Writing (Rhet 3-551) or Scientific and Technical Writing (Rhet 3-562). Additional requirements as to number of credits and specific courses depend upon the particular curriculum for which the student is registered.

The Rhetoric Department also offers courses in humanities, literature, original writing, speech, and dramatics. A number of these courses may be used to

fulfill the distribution requirements in categories I, III, and IV (see the *College of Agriculture Bulletin*).

1-101. COMMUNICATION I. (4 cr)
Writing from observation and experience about contemporary issues. Attention to grammar, sentence and paragraph construction, punctuation, spelling. Integrated assignments in reading, listening, and speaking. Progress tests.

1-102. COMMUNICATION II. (4 cr)
The expository paper. Note-taking, outlining. Short themes, library research about contemporary issues, term paper, documentation. Integrated assignments in reading, listening, and speaking.

1-147. EFFICIENT READING. (3 cr; Arts College students see *College of Liberal Arts Bulletin*...CBA students see *College of Business Administration Bulletin*)
Designed to increase reading rate comprehension and vocabulary. For persons of average or above-average reading ability who wish to achieve or maintain superior scholastic status. Not a remedial course.

1-222. PUBLIC SPEAKING. (4 cr; prereq rhet comm req, soph)
Practical course in fundamentals of speechmaking. Emphasis upon organizing the speech and projecting it to the audience.

1-225. PARLIAMENTARY PROCEDURE. (1 cr)
Parliamentary procedure applied to group organization and management. Duties of officers and disposition of motions emphasized. Individual participation stressed through role playing and other workshop procedures.

1-251. EFFECTIVE LISTENING. (3 cr)
Designed to increase listening comprehension by developing three central abilities. Readings, research, theory, and practice.

3-551. PROFESSIONAL WRITING. (3 cr; either 3-551 or 3-562 is required of all students unless exempted through deptl exam; prereq jr)
Projects and reports in professional communication; the résumé, application letter, interview; study of professional journals; the review of literature; specialized bibliographic tools; the feature article. Selected exercises in exposition. Review of usage and style.

3-562. SCIENTIFIC AND TECHNICAL WRITING. (3 cr; either 3-562 or 3-551 is required of all students unless exempted through deptl exam; prereq jr)
Methods of exposition in scientific and technical writing; types of reports; audience analysis; continuous practice in report writing.

Soil Science (Soil)

1-122. INTRODUCTORY SOIL SCIENCE. (4 cr; prereq ¶Chem 1-004 or equiv)
Basic physical, chemical, and microbiological properties of soil. Soil genesis, classification, and principles of soil fertility. Lectures, laboratory.

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* See *General Information Bulletin*

* See *General Information Bulletin*

ADDITIONAL INFORMATION

PUBLICATIONS

For additional information about the profession of forestry write to:

Society of American Foresters
425 Mills Building
704 - 17th Street N.W.
Washington, D.C. 20006

Forest Service
U.S. Department of Agriculture
Washington, D.C.

College of Forestry
University of Minnesota
St. Paul, Minnesota 55101

American Forestry Association
919 - 17th Street N.W.
Washington, D.C. 20006

For additional information about the College of Forestry write for its brochure. For added information on the University, send for a *General Information Bulletin;* address request to University of Minnesota, Minneapolis, Minnesota 55455.

MOTION PICTURES

Careers in Forestry (28-minute, color)

New Horizons in Wood (28-minute, color)

Interested groups or individuals may obtain these films from:

Visual Aids Department
Coffey Hall
University of Minnesota
St. Paul, Minnesota 55101