

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE


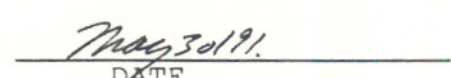
COURSE TITLE: TREE IMPROVEMENT

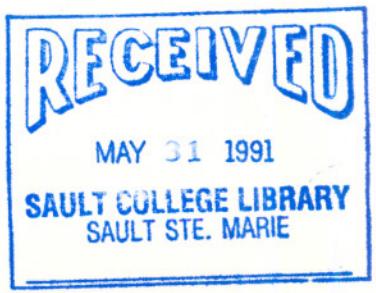
CODE NO.: FOR 352-3 SEMESTER: VI

PROGRAM: FOREST MANAGEMENT TECHNOLOGY

AUTHOR: MARK HARVEY

DATE: MAY 1991 PREVIOUS OUTLINE DATED: SEPT 1989

APPROVED:  
DEAN DATE



FOREST MANAGEMENT TECHNOLOGY

FOR 352-3

COURSE NAME

COURSE NUMBER

TOTAL CREDIT HOURS: 48

PREREQUISITE(S): None

I. PHILOSOPHY/GOALS:

Upon completing this course students will have a broad understanding of tree improvement practices currently in use across Canada. The course is designed to provide a general survey of all aspects of tree improvement through reading assignments, projects, regular lectures, guest lectures and audio-visual presentations and field trips. A more detailed in-depth examination of practical aspects of tree improvement will help students to assume an on the job role in tree improvement with government and industry.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will:

1. Have a fundamental understanding of genetics and the forces that shape the classical genetic make-up of our forests.
2. List the goals and objectives of the Ontario Tree Improvement Program.
3. Identify the criteria used for plus tree selection of important commercial tree species in Ontario.
4. Apply, in theory, concepts of tree improvement to protect the genetic diversity and genetic quality of our forests.
5. Discuss cultural and management techniques used to produce genetically improved tree seed in Ontario.
6. Design the specifications and planting plans needed for cloned and seedling seed orchards.
7. Develop an appreciation for the concepts of provenance and seed zones and how these concepts are applied in Ontario.

FOREST MANAGEMENT TECHNOLOGY

FOR 352-3

COURSE NAME

COURSE NUMBER

III. TOPICS TO BE COVERED:

1. Classical Genetics
2. Forest Genetics
3. Introduction to Tree Improvement in Ontario
4. The Ontario Tree Improvement Master Plan
5. Plus Tree Selection
6. Seed Producing Areas
7. Seed Orchard Design and Management Techniques
8. Provenance and Seed Zones
9. Adaptation and Variation of Selected Tree Species and Case Study
10. Special Propagation Techniques for Tree Improvement Programs

V. METHOD OF EVALUATION:

Term Test #1	15
Term Test #2	15
Term Test #3	20
Reading Assignment	15
Seed Orchard Assignment	20
Participation	5
Fall Field Camp	10
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	100%

FOREST MANAGEMENT TECHNOLOGY

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V. METHOD OF EVALUATION: (CONTINUED)

A+ = 90-100%
A = 80-89%
B = 70-79%
C = 60-69%
R = less than 60%

Assignments must be completed on time. Marks will be deducted at 10% per school day assignments are overdue.

Normally, a rewrite examination will not be given in this course. Exceptions may be made for medical or compassionate reasons only.

VI. REQUIRED STUDENT RESOURCES:

Operational Guidelines for Tree Improvement in Ontario. Ontario Ministry of Natural Resources. 1989.

VII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY BOOK SECTION:

Zobel, B.J. and Talbert, J.T., 1989. Applied Forest Tree Improvement. Published by John Wiley and Sons, Toronto. 505 p.

VIII. SPECIAL NOTES:

Students will participate in a two week field trip early in the fall semester. Tree improvement and silvicultural tours and exercises completed during this trip are to be treated as a component of this course.

SEED ORCHARD ASSIGNMENT
FOR352

Each student will produce a scale diagram of a clonal seed orchard and a seedling seed orchard, showing blocks but not individual clones or families.

In addition, students will produce a scale diagram of one block from both a clonal and a seedling showing individual clones, seed orchard families.

Students will then calculate the number of container seedlings that will be produced from seeds collected from each orchard at age 30.

Assignment is 20% of grade.

Due: December 6, 1991

READING ASSIGNMENT OF
SELECTED TOPICS IN TREE IMPROVEMENT

FOR 352
15%

Each student has been provided with 10 selected papers on tree improvement and forest genetics. Students are to read all 10 papers and highlight important sections. Later in the semester there will be an open book 1 hour test. There will be 5 questions, any 3 must be answered.

Students must carefully study the papers prior to the test in order to use the 1 hour time period effectively. The test will be graded for organization of written materials, technical content, and the ability to read and extract the most valuable information.

- Paper #1 Beineke, W.F. 1989. Twenty years of black walnut genetic improvement at Purdue University. NJAF 6:68-71.
- 2 Stefan, Susan. 1989. Micropropagating black walnut. American Nurseryman 169(3):89-92.
- 3 Rehfeldt, G.E. 1988. Ecological adaptations in Douglas-fir (Pseudotsuga menziesii var. glauca). IV. Montana and Idaho near the continental divide. WJAF 3(4):101-105.
- 4 Joyce, D.G. 1988, Adaptive variation in cold hardiness of eastern larch, Larix laricina, in Northern Ontario. Can. J. For. Res. 18:85-89.
5. Maynard, C.A. 1988. Controlling the genetic quality of planting stock from forest tree nurseries. In Northeastern Area Nurserymen's Conference Proceedings, 1988. p 40-49.
6. Boyle, T.J.B. 1987. Future breeding strategies and the need for early testing in black spruce. In Deneritt, M.E. Jr., ed. Proc. 30th N.E. Forest Tree Improvement Conf., School of Forest Res., U. of Maine, Orono July 22-24, 1986. p. 65-71.
7. Beers, W.L., Bivens, J., and Moche, J.E. 1981. Chapter 6, Pollen Collections, Franklin, E.C. ed. Pollen management handbook, Agri. Handbook. 587. Washington, D.C.:U.S. Dept. of Agri;1981. p. 37-39.

8. Matthews, F.R., and Kraus J.F., 1981. Chapter 8, Pollen Storage. Franklin E. Carlyle ed. Pollen management handbook. 587. Washington, D.C.; U.S. Dept. of Agri; 1981. p. 37-39.
9. Bramlett, D.L. and O'Gwynn, C. 1981. Chapter 10, Controlled Pollination. Franklin, E.C. ed. Pollen management handbook. Agri. handb. 587. Washinton D.C.:U.S. Dept. Agri.; 1981. p.44-49.
10. Sprague, J.; Jeff J.B.; and Zobel, B. 1978, In F.T. Bonner ed. Proceedings from Flowering and Seed Development in Trees. Mississippi State Univ. 1978. p. 145-160.