

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

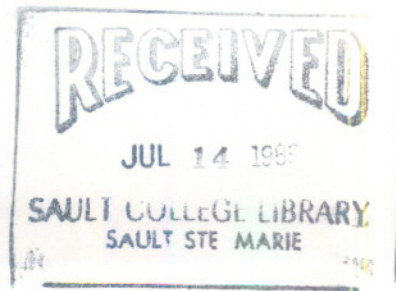
COURSE OUTLINE

Course Title: FOREST PATHOLOGY  
Code No.: FOR 114-3  
Program: FORESTRY  
Semester: IV  
Date: JULY, 1989  
Author: G. STONE

New: \_\_\_\_\_ Revision: X

APPROVED: *G. Stone*  
Chairperson

July 11/89  
Date



CALENDAR DESCRIPTION

FOREST PATHOLOGY

FOR 114-3

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Course Name

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Course Number

PHILOSOPHY/GOALS:

The purpose of this course is to familiarize the student with forest tree diseases; their identification, life history, control and impact on the practice of forest management.

METHOD OF ASSESSMENT (GRADING METHOD):

Evaluations:	Assignments	60% of total mark
	Slide test	20% of total mark
	Specimen test	<u>20%</u> of total mark

100%

Grading: A+ - 90% exceptional  
A - 85% consistently outstanding  
B - 75% above average  
C - 60% basic understanding of course material

I - Incomplete

Each student must pass each item listed under evaluation. Marks will then be averaged to give the final mark. A student receiving an "I" in any aspect of the course will be given an opportunity to rewrite. The opportunity to rewrite is a privilege and not a right.

<u>FOREST PATHOLOGY ASSIGNMENTS</u>	<u>RESOURCES</u>	<u>DUE DATE (TBA)</u>
1. Collect and identify at least ten fungi of Ontario.	Manion Lincoff	
2. Construct a dichotomous key to separate fungi collected and identified.	Lab Manual	
3. Classify forest/shade tree diseases using seven different methods:  a) taxonomic b) biotic/abiotic decline c) forest product d) part of tree e) infectious/non-infectious f) parasitic/saprophytic g) necrotic/atrophic/hypertrophic  Define each term used in the classifications, and give one example of a disease for each.	Manion Lab Manual	
4. Identify and describe types of biotic or infectious forest/shade tree diseases - fungi, bacteria, nematode, virus, mycoplasma, seed plant.  Present in the form of a chart, using the following headings: Size, Shape, Parasitic/Saprophytic, Signs, Symptoms, Spread, Damage, Importance, Method of Reproduction, Control, Example.	Manion Lab Manual	
5. Identify and describe types of abiotic stress of forest/shade trees. Divide information into 3 categories: climatic, nutrient and mechanical stress. Present in form of 3 separate charts. Under climatic compare asphyxiation, drought, sunscald (summer and winter), stem girdle, dessication, winter drying, frost (kill, crack, heaving). Under nutrient compare nutrient deficiency (nitrogen, phosphorous, potassium) and pollution (salt, ozone, flouride, sulfur dioxide). Under mechanical damage, compare snow, ice, machine, animal, lightning & wind.	Manion Lab Manual	

FOREST PATHOLOGY ASSIGNMENTS RESOURCES

DUE DATE (TBA)

6. Construct a dichotomous key to Lab Manual  
separate abiotic agents of  
tree diseases.
7. Describe sequence of sexual Manion  
and asexual stages of growth Lab Manual  
of one important fungus disease Microscope  
for each of the two most common  
classes of fungi:
  - ascomycetes
  - basidiomycetesusing microscopic characteristics.
8. Describe life cycles of at Manion  
least ten biotic (infectious) Lab Manual  
forest/shade tree diseases of  
Ontario using signs and  
symptoms.
  - \*a) Mychorrhizal Fungi
    - ectomychorrhizae
    - endomychorrhizae
    - ectendomychorrhizae
  - b) Foliage Diseases
    - \*- septoria leaf spot
    - \*- needle cast
    - oak anthracnose
  - c) Rust Diseases
    - \*- PW blister rust
    - western gall rust
    - eastern gall rust
    - leaf blister rust
  - d) Canker Diseases
    - \*- scleroderris canker
    - \*- hypoxylon canker
    - eutypella canker
    - nectria canker
  - e) Vascular Wilt Diseases
    - \*- dutch elm disease
    - verticillium wilt
    - oak wilt

FOREST PATHOLOGY ASSIGNMENTS RESOURCES

DUE DATE (TBA)

- f) Wood Decay and Stain
  - \*- one white rot
  - \*- one brown rot
  - \*- at least one of above with a wood stain
- g) Root Rots
  - \*- armillaria root rot
  - heterobasidion root rot
- h) Parasitic Seed Plants
  - \*- dwarf mistletoe
- i) Decline Disease
  - \*- maple decline
- j) Seedling Diseases
  - \*-damping off

\*Must do

- 9. Describe impact of temperature, moisture and wind on spread & development of a fungus disease. Manion Library
- 10. State and explain natural succession of infectious (biotic) disease organisms following:
  - physical injury
  - fire
  - insectClass Notes Library Field Exercise
- 11. List and describe at least five silvicultural methods for prevention of forest/shade tree diseases. Silviculture Class Library Manion
- 12. Describe ways in which forest/shade tree diseases change species composition, resulting economic and aesthetic values with examples of each. Silviculture Class Library Biology Class Manion
- 13. Describe use of fungicides to eradicate or control tree diseases in the field and under controlled conditions. Library Manion Silviculture Class
- 14. Collect and record data for cull survey, according to specified sample design. Silviculture Class Field Exercise

FOREST PATHOLOGY ASSIGNMENTS

RESOURCES

DUE DATES (TBA)

15. Research forest/shade tree pathology literature, and report on specific problem or issue, and prepare audio-visual materials for a forest/shade tree pathology presentation to a specific audience (see explanation following #17).  
Library  
Teacher  
Manion
16. Describe the purpose of the following acts, as they apply to Forest Pathology:  
a) Pest Control Products Act  
b) Forest Tree Pest Control Act  
c) Environmental Protection Act  
Law Course  
Environmental Biology
17. List and describe equipment and procedures involved in collecting, preserving, and recording forest/shade tree data  
a) Forest Insect and Disease Survey  
b) Shade Tree Diagnosis.  
Great Lakes Forest  
Research Centre Tour  
Manion
- Define role of a forest technician in relation to the Forest Insect and Disease Survey.

AUDIO VISUAL PRESENTATION

**OBJECTIVE:**

Prepare audio/visual materials for a forest/shade tree pathology presentation to a specific audience.

**AUDIO/VISUAL MATERIALS:**

Video-tape, overhead projections, 35 mm slides, slide-tapes, charts, posters, drawings, illustrations.

**FOREST/SHADE TREE PATHOLOGY:**

Any important message that needs to be put across to a given group of people. Focus should be on a concern of chosen audience. Can be a forest concern, or an urban concern; example, "How to Tell What is Wrong with the Tree in My Front Yard", or "Life Cycle of Gremeniella Abietina".

**SPECIFIC AUDIENCE:**

Public school, high school, first year Forestry students, neighbourhood group, municipal government, conservation group, any audience where you would feel comfortable.

**SCRIPT:**

Verbal communication to accompany audio/visual presentation. Must be geared to level of audience.

**PREPARATION AND PRESENTATION:**

Can be done as an individual or teamed up with one other person (one who will complement your skills).

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TEXTBOOK(S):

Forest Pathology Lab Manual, Campus Bookstore.

Lincoff, G. H. 1981 "The Audubon Society" - Field Guide, North American  
Mushrooms. Alfred A. Knopf, New York.

Manion, Paul D. 1981. "Tree Disease Concepts".



LEARNING OBJECTIVES

OBJECTIVES	CONDITION	MODULE #
Classify forest shade/tree diseases using six different methods - part of tree, taxonomic product, infectious/non-infectious, parasitic/saprophytic, necrotic/atrophic/hypertrophic.	- Field, slides, specimens	2970.01
Identify 10-15 fungus diseases of Ontario to scientific name - modified according to projected forecast.	- Field, slides, specimens	2970.01
Identify & describe types of infectious diseases (forest/shade) fungi, bacteria, nematodes, viruses, mycoplasma & seed plants.	- Chart	2970.01
Identify and describe three types of stress (non-infectious diseases) of forest/shade trees - moisture, temperature, & soil.	- Chart	2970.01
State & explain natural succession of infectious disease organisms following: a) physical injury b) insect attack and c) fire.	- Given field samples	2970.01
Recognize and describe life cycles of 10-15 infectious forest/shade tree diseases of Ontario using signs and symptoms.	- Slides, specimens, drawings	2970.01 2970.04
List and describe equipment and procedures involved in collecting, preserving and recording forest/shade tree data - a) forest insect & disease survey b) shade tree diagnosis.	- Collection/diagnosis in field	2970.01

LEARNING OBJECTIVES

OBJECTIVES	CONDITION	MODULE #
Describe the purpose of the following acts as they apply to forest pathology: - Pest Control Products Act - Forest Tree Pest Control Act - Environmental Protection Act	- Classroom	2970.02
Collect & identify at least 10 common fungi in Ontario.	- Key	2970.01
Describe sequence of sexual and asexual stages in growth of one important fungus disease for each of the two most common classes of fungi - a) ascomycetes b) basidiomycetes	- Microscope	2970.04
List and describe "X" methods of biological & silvicultural control of forest/shade tree diseases.	- Classroom	2970.04
Describe impact of temperature, moisture and wind in spread of fungus diseases.	- Classroom	2970.01
List & describe "X" silvicultural methods for prevention of forest/shade tree diseases.	- Classroom	2970.02
Describe ways in which forest/shade tree diseases change species composition & resulting economic & aesthetic values with examples of each.	- Classroom	2970.01
Research forest/shade tree pathology literature & report on specific problem or issue.	- Classroom, Library	2965.01 2965.03

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**LEARNING OBJECTIVES**

<b>OBJECTIVES</b>	<b>CONDITION</b>	<b>MODULE #</b>
Prepare audio-visual materials for a forest/shade tree pathology presentation to a specific audience.	- Classroom	2965.02
		2965.04
		2965.05
Collect & record data for a cull survey according to specified sample design.	- Field, Classroom	2967.04
		2967.01
Describe use of fungicides to eradicate or control tree diseases in the field and under controlled conditions.	- Field, Classroom	2968.07
Define role of forest technician in relation to the forest insect and disease survey.	-Classroom	2965.04

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TOPIC NO.	PERIODS	TOPIC DESCRIPTION
1	2	<u>Introduction</u> - outline evaluation, grading, importance, lab manual, assignments, technical report, fungus collection.
2	1	<u>Infectious Diseases</u> - fungi, bacteria, virus, parasitic seed plant, mycoplasma, nematodes.
3	1	<u>Symptomatology</u> - signs, symptoms, slides, specimens, drawings and descriptions.
4	3	<u>Abiotic Agents of Tree</u> - slides and specimens, key construction, design a key to separate.
5	2	<u>Classification and Reproduction</u> - description and recognition, signs and symptoms labelled drawings, slides, life cycles, design a key to separate four classes of fungi.
6	1	<u>Succession of Organisms</u> - description, examples, assignment.
7	1	<u>Control of Forest Diseases</u> - exclusion, eradication, protection, resistance, assignment.
8	1	<u>Mycorrhizal Fungi</u> - types, mode of action, association cycle, importance and recognition.
9	1	<u>Foliage Diseases</u> - types, mode of action, disease cycle, symptoms, recognition, examples, control.
10	1	<u>Rust Diseases</u> - types, mode of action, disease cycle, diagnosis examples.
11	1	<u>Canker Diseases</u> - types, mode of action, disease cycle, symptoms, diagnosis, examples, control.

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TOPIC NO.	PERIODS	TOPIC DESCRIPTION
12	1	<u>Vascular Wilt Diseases</u> - types, mode of action, disease cycle, symptoms, diagnosis, example, control.
13	1	<u>Wood Decay</u> - types, mode of action, disease cycle, symptoms, recognition, identification based on fruiting bodies, examples, role in succession, control.
14	1	<u>Wood Stain</u> - types, mode of action, disease cycle, symptoms, examples.
15	1	<u>Root Rots</u> - types, mode of action, disease cycle, symptoms, diagnosis, examples, control, forest practices.
16	1	<u>Parasitic Seed Plants</u> - types, mode of action, disease cycle, symptoms, examples and control.
17	1	<u>Decline Diseases</u> - decline syndrome, symptoms, examples, ecological role.
18	1	<u>Seedling Diseases</u> - types, damping off, root rots, foliage and stem
19	1	<u>Impact of Forest Tree Diseases on Forest Management in the Boreal Region</u>
20	1	<u>Concept of Urban Tree Management</u>
21	2	REVIEW
22	2	FIELD TRIP
23	2	TESTS - Slide test and specimen test.