

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



COURSE OUTLINE

COURSE TITLE: Forest Health

CODE NO. : NRT243 **SEMESTER:** 3

PROGRAM: Forest Conservation Technician

AUTHOR: J. Zuchlinski, M.Sc (Updated by E. Muto)

DATE: Aug 2015 **PREVIOUS OUTLINE DATED:** May 2014

APPROVED: "Colin Kirkwood" Aug 2015
DEAN/CHAIR **DATE**

TOTAL CREDITS: 4

PREREQUISITE(S): None

HOURS/WEEK: 4

Copyright ©2015 The Sault College of Applied Arts & Technology
Reproduction of this document by any means, in whole or in part, without prior written permission of Sault College of Applied Arts & Technology is prohibited.
For additional information, please contact Colin Kirkwood,
Dean, Environment/Technology/Business
(705) 759-2554, Ext.2688

I. COURSE DESCRIPTION:

This course introduces the student to the disciplines of pathology and entomology through an examination of a variety of biotic and abiotic factors that impact on the health of forest environments. Particular emphasis is placed on the identification, biology and ecology of insects and fungi that are associated with tree species, Abiotic stresses related to temperature, precipitation, soil conditions, etc. are examined in terms of their effect on physiological processes and the recognition of manifested symptoms.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Collect, preserve, process, and present insect specimens in accordance with scientific standards

Potential Elements of the Performance:

- Demonstrate various tools and methods of collecting insect specimens including nets, traps and baits.

2. Identify adult insects from a variety of Orders to the Family level using taxonomic keys and microscopic technique

Potential Elements of the Performance:

- Demonstrate use of taxonomic keys
- Demonstrate use of the binocular microscope
- Identify selected specimens into appropriate taxonomic groupings

3. Recognize a selected number of harmful and beneficial insects associated with commercial tree species.

Potential Elements of the Performance:

- Identify 15 selected Hymenoptera
- Identify 15 selected Lepidoptera
- Identify 10 selected Coleoptera
- Identify 10 selected Hemiptera/Homoptera
- Identify 5 selected Diptera

4. Describe the biology and ecology of insects in general and selected harmful and beneficial species

Potential Elements of the Performance:

- Identify and describe the function of external structures of insects
 - Describe the significant anatomical features which distinguish insects from other arthropods
 - Describe the significant anatomical features which distinguish insect Orders
 - Distinguish between various types of insect metamorphosis
 - Demonstrate correct use of entomological terminology presented in the course
 - For selected species; research and describe their life cycle, the type of damage caused and general importance to the harvesting industry
 - Categorize and recognize different types of damage caused by insects
 - Describe positive contributions that insects make to the health and sustainability of forest environments
 - Prepare properly labeled scientific drawings from microscopic examinations of specimens
5. Describe procedures used in the monitoring and control of pest species

Potential Elements of the Performance:

- Describe the objectives of the Forest Disease and Insect Survey and pest monitoring in general
 - Describe monitoring procedures for select forest pest species
 - Describe various methodologies for pest management including; cultural, chemical and biological treatments
 - Describe integrated control strategies for select forest pest species
 - Conduct field surveys to assess insect damage potential
6. List and describe abiotic stress factors

Potential Elements of the Performance:

- List abiotic factors that affect trees
- Describe the damage and impacts of abiotic stresses
- Suggest management techniques to minimize abiotic stress

7. Describe select biotic diseases of trees

Potential Elements of the Performance:

- List the causal agents of tree diseases
- Describe 6 categories of biotic induced diseases
- Describe the life cycle, damage caused and significance of select tree diseases
- Suggest management strategies to minimize disease impacts
- Prepare drawings of the reproductive structures of fungi

8. Use signs and symptoms to identify diseases

Potential Elements of Performance

- Distinguish between signs and symptoms
- Collect and identify 20 designated fungal/disease specimens
- Identify select fruiting structures of fungi
- Categorize symptoms used in disease identification

III. TOPICS:

1. An Introduction to forest pathology
2. Abiotic pathogens
3. Symptomology
4. Biotic Pathogens
5. Classification of Phylum Arthropoda
6. Insect Life Cycles
7. Internal and external anatomy of insects
8. Economic and ecological importance of insects
9. The orders Hymenoptera, Diptera, Coleoptera, Heteroptera and Lepidoptera
10. Integrated pest management

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Borror, D.J. ,C.A. Triplehorn and N.F. Johnson. 1989. An introduction to the study of insects. 6th Ed. Harcourt Brace College Publishers. 875 pp.

V. EVALUATION PROCESS/GRADING SYSTEM:

1. Lab participation	40%
2. Assignments	30%
3. Tests	40%
TOTAL	100%

Note 1: The lab participation mark is based on 100% attendance. Missed classes will result in deductions from the 40% participation mark as follows:

- 1st missed class -5%
- 2nd missed class -5%
- 3rd missed class -10%
- 4th missed class -10%
- 5th missed class -10%

Note 2: It is impossible to do this course without the required textbook. If you do not have this book by the third week of the course you will not be allowed to continue in the course.

The following semester grades will be assigned to students:

Grade	<u>Definition</u>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	

W Student has withdrawn from the course without academic penalty.

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

VI. SPECIAL NOTES:

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located in D2L and on the portal form part of this course outline.