



## I. COURSE DESCRIPTION:

This course provides the student with an introduction to the biology of insects, their ecology in relation to forest environments, their impact on the timber harvesting industry and methods for minimizing their damage. Emphasis is placed on insect species associated with commercial tree species in eastern Canada.

## 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.
- Collect and mount 75 species of adult insects and appropriately record collection information.

*Approximate value – 7%*

2. Identify 75 adult insects to the order level and 50 adult insects to the Family level using taxonomic keys and microscopic technique

Potential Elements of the Performance:

- Present a collection of 75 species of adult insects.

*Approximate value –25%*

3. Recognize by genus and/or species selected 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

*Approximate value – 20%*

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
- Discuss 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

*Approximate value – 30%*

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

*Approximate value – 25%*

### III. TOPICS:

1. Classification of the Phylum Arthropoda
2. Insect life cycles
3. Internal and external anatomy of insects
4. Economic and ecological significance of forest insects
5. The Order Hymenoptera
6. The Order Lepidoptera
7. The Order Coleoptera
8. The Orders Hemiptera and Homoptera
9. The Order Diptera

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. 6<sup>th</sup> Ed. Harcourt Brace College Publishers. 875 pp.

Forest Entomology Study Guide.

**V. EVALUATION PROCESS/GRADING SYSTEM:**

1. Insect collection	25%
2. Lab assignments	25%
3. 1 Lab test	20%
4. 2 Theory tests	<u>30%</u>
<b>TOTAL</b>	<b>100%</b>

The value of lab assignments and reports will be reduced at a rate of 10% per day for late submissions for a period of 5 days after the due date. After 5 days the lab assignment/report value be zero. All labs, assignments and reports must be submitted regardless of lateness to pass the course.

A collection of 75 adult insects (identification at this point is not required) must be completed by the second lab period of the course in order to remain in the course.

Failure to attend a lab will bear a penalty of 2% off the final mark for the course for each lab not attended.

Attendance at the optional evening sessions will provide a 1% bonus mark for each session attended.

Failure to attend a test without medical or severe personal reasons will result in a zero and no opportunity to make up the test will be offered.

No rewrites will be made available at semester end.

The following semester grades will be assigned to students in postsecondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	3.75
B	70 - 79%	3.00
C	60 - 69%	2.00
F (Fail)	59% and below	0.00
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.	

## VI. SPECIAL NOTES:

### Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493 so that support services can be arranged for you.

### Retention of course outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

*<include any other special notes appropriate to your course>*

**VII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.