



Forest Entomology

- NRMT/BIOL 3217 -

Course Syllabus (Winter 2023)

Instructor: Dr. Seung-Il Lee

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Lecture: Monday & Wednesday 1:30 PM – 2:30 PM (RC1003)

Lab (BIOL/NRMT-3217L-W1): Thursday 8:30 AM – 11:30 AM (BB1061-Dendrology Lab)

Lab (BIOL/NRMT-3217L-W2): Monday 8:30 AM – 11:30 AM (BB1061-Dendrology Lab)

Course Description:

Insects comprise a great diversity of animal life on Earth, and provide important values for environmental and animal health including human well-being. This course will explore the rich diversity of forest insects, and provide comparative morphology, life history, ecology, and damages caused by pest species in forests.

Course Objectives:

- To illustrate the biology, natural history and diversity of forest-dwelling insects in a forestry context and provide basic understanding of the classification system used to store and organize information about them.
- To provide an opportunity to learn to identify insects common in Canadian forests and to recognize damage associated with common pest species.
- To review the general methods for managing forest pest insects and explore the general philosophy of integrated pest management as is appropriate for modern sustainable forest management.
- To foster appreciation for the significance of entomological research in the context of forest management.

Lecture Schedule:

| Lecture | Date | Topic |
|-------------------------------------|---------|--|
| 1 | Jan. 9 | Syllabus & Introduction to Forest Entomology |
| 2 | Jan. 11 | Arthropod Classification and Relationships |
| 3 | Jan. 16 | Insect diversity I |
| 4 | Jan. 18 | Insect diversity II |
| 5 | Jan. 23 | External Structure & Function |
| 6 | Jan. 25 | Internal Structure & Function |
| 7 | Jan. 30 | Reproduction |
| 8 | Feb. 1 | Nervous System |
| 9 | Feb. 6 | Defoliators: Lepidoptera |
| 10 | Feb. 8 | Defoliators: Sawflies |
| 11 | Feb. 13 | Exam Review |
| | Feb. 15 | Midterm Exam |
| Reading Week (Feb. 20-24): No Class | | |
| 12 | Feb. 27 | Spruce Budworms: Canada's No.1 defoliator |
| 13 | Mar. 1 | Seed and Cone Pests |
| 14 | Mar. 6 | Young Stand Pests |
| 15 | Mar. 8 | Wood Borers |
| 16 | Mar. 13 | Bark Beetles |
| 17 | Mar. 15 | Insect Collecting Methods |
| 18 | Mar. 20 | Insect-Plant Interactions/Insect-Bird Interactions |
| 19 | Mar. 22 | Insect Population Dynamics |
| 20 | Mar. 27 | Integrated Pest Management |
| 21 | Mar. 29 | Insects and Silviculture |
| 22 | Apr. 3 | Insect Biodiversity and Forest Management |
| 23 | Apr. 5 | Exam Review |
| | TBA | Final Exam |

Laboratory Schedule:

| Lab | Date | Topic |
|-----------------------------------|---------|--|
| 1 (W2) | Jan. 16 | External Morphology |
| 1 (W1) | Jan. 19 | External Morphology |
| 2 (W2) | Jan. 23 | Insect Classification |
| 2 (W1) | Jan. 26 | Insect Classification |
| 3 (W2) | Jan. 30 | Endopterygote Larvae |
| 3 (W1) | Feb. 2 | Endopterygote Larvae |
| 4 (W2) | Feb. 6 | Lepidoptera I |
| 4 (W1) | Feb. 9 | Lepidoptera I |
| W2 | Feb. 13 | Lab Midterm Exam |
| W1 | Feb. 16 | Lab Midterm Exam |
| Reading Week (Feb. 20-24): No Lab | | |
| 5 (W2) | Feb. 27 | Lepidoptera II |
| 5 (W1) | Mar. 2 | Lepidoptera II |
| 6 (W2) | Mar. 6 | Coleoptera |
| 6 (W1) | Mar. 9 | Coleoptera |
| 7 (W2) | Mar. 13 | Hymenoptera |
| 7 (W1) | Mar. 16 | Hymenoptera |
| 8 (W2) | Mar. 20 | Pests of Shrubs, Ornamentals & Wood Products |
| 8 (W1) | Mar. 23 | Pests of Shrubs, Ornamentals & Wood Products |
| 9 (W2) | Mar. 27 | Lab Exam Review |
| 9 (W1) | Mar. 30 | Lab Exam Review |
| W2 | Apr. 3 | Lab Final Exam |
| W1 | Apr. 6 | Lab Final Exam |

Mark Weightings:

- Final percentage marks will be calculated as follows.

| | Exam | Date | Percentage |
|----------------|--------------------|-----------------|------------|
| Lecture | Written Assignment | Mar. 26 | 10% |
| | Midterm Exam | Feb. 15 | 20% |
| | Final Exam | TBA | 30% |
| Lab | Lap Report | End of each lab | 10% |
| | Lab Midterm Exam | Feb. 13 & 16 | 10% |
| | Lab Final Exam | Apr. 3 & 6 | 20% |

- Written Assignment (Due Mar. 26):** Students must choose one of the following insect species (Listed below), and provide a brief literature review. The review should include scientific classification, morphology, biology, life-history and environmental impacts or management options of the species. Comparisons of similar species are also encouraged to be presented. This written assignment is required for successful completion of NRMT/BIOL 3217. The paper must be typed in double-spaced text with font 'Calibri' size 12, and page margins > 2.5 cm. Length should be 4-5 pages (not including title page and references). You are also encouraged to add photos in the paper up to 4 with proper credits.

| List of Species |
|--|
| 1. Mountain Pine Beetle (<i>Dendroctonus ponderosae</i>) |
| 2. Spruce Beetle (<i>Dendroctonus rufipennis</i>) |
| 3. Root Collar Weevil (<i>Hylobius warreni</i>) |
| 4. White-spotted Sawyer (<i>Monochamus scutellatus</i>) |
| 5. Asian Longhorned Beetle (<i>Anoplophora glabripennis</i>) |
| 6. Emerald Ash Borer (<i>Agrilus planipennis</i>) |
| 7. Forest Tent Caterpillar (<i>Malacosoma disstria</i>) |
| 8. Spongy Moth (<i>Lymantria dispar</i>) |
| 9. Eastern Spruce Budworm (<i>Choristoneura fumiferana</i>) |
| 10. Aspen Serpentine Leafminer (<i>Phyllocnistis populiella</i>) |
| 11. Birch Leafminer (<i>Fenusa pusilla</i>) |
| 12. Canadian Tiger Swallowtail (<i>Papilio canadensis</i>) |
| 13. Giant Water Bug (<i>Lethocerus americanus</i>) |
| 14. Golden Northern Bumble Bee (<i>Bombus fervidus</i>) |
| 15. Boreal Bluet (<i>Enallagma boreale</i>) |

- **Lap Report:** Each report must be submitted by the end of each lab. You need to bring a note, pencil and eraser.
- **Midterm Exam (Lecture):** Covers all topics presented in Lectures 1-10.
- **Midterm Exam (Lab):** Covers all topics presented in Labs 1-4.
- **Final Exams:** Final exams for both lecture and lab will cover everything you learned in NRMT/BIOL 3217. Additional information will be provided in class.

Notes and Expectations About Student Conduct:

- **Class and Laboratory Attendance:** Much of the material covered in class is not easily available elsewhere. Students are therefore encouraged to attend class regularly. There is a long-standing positive correlation between final mark and class attendance. The laboratory exercises are an essential part of the course material. Grades will undoubtedly reflect attendance and participation.
- **Disruptive Behaviour in Class:** Talking and other disruptive behaviour during lecture and lab presentations will not be tolerated. The rule in NRMT/BIOL 3217 is that disruptive students are given one warning and, upon a second offense, will be asked to leave the classroom. Disruptive behaviour prevents other students from making the most of their classroom opportunities. Please be courteous to your fellow students. Sleep if you like, but don't expect credit for it, stay in your seat (use a belt if necessary) and try not to snore. If you are awake, we will expect you to contribute to in class discussions from time to time.
- **Record Class Sessions:** Recording of lectures and/or labs is allowed ONLY with my prior written consent or as a part of an approved accommodation plan. Recorded materials and all other course materials are to be used solely for personal study, and are not to be distributed.
- **Cheating & Plagiarism:** We are required to remind all students about provisions for dealing with cheating, plagiarism and other ethical matters as defined by the *Student Code of Conduct*, which you may find at <https://www.lakeheadu.ca/students/student-life/student-conduct/academic-integrity/node/51239> along with other aspects of how the University deals with these issues. Please familiarize yourself with these expectations and understand that *actions as laid out by the code are not discretionary and must be taken with respect to any offense committed in the context of any formal course.* What constitutes 'cheating' and

‘misrepresentation of facts’ (= lying) should be clear to you. The concept of ‘plagiarism’ may be less clear for some students but this is regarded as a highly important matter in advanced scholarship. Simply put, plagiarism is to pass off somebody else’s words, concepts or work as your own without giving proper citation or acknowledgement. If you have questions about what constitutes cheating or plagiarism, clear them up with the instructor *before* engaging in the suspect behaviour. *Plagiarism and other forms of cheating will not be tolerated.*

- **Marking & Grading:** All work assigned in the course must be completed for a student to pass the course successfully. If you do not complete all of the work required in the lab, or have an unexcused absence for either the midterm or final exam you will be given a grade of incomplete which will have to be cleared under standard University rules or converted to a grade of F. If you miss a lab or lecture exam you will also be given a mark of 0%, unless you have a valid reason. If one midterm is not written because of illness or campus-sanctioned absence, the marks will be transferred to the final exam. Unexplained absences from midterms will result in a grade of 0%. A student who cannot write a term examination or complete a term assignment due to incapacitating illness, severe domestic affliction or other compelling reasons can apply for extension of time to complete an assignment. A student who cannot write the final examination due to incapacitating illness, severe domestic affliction or other compelling reasons can apply for a deferred final examination. Such an application must be made to the course instructor within 24 hours of the missed examination. Deferral of term work or exams is a privilege and not a right; there is no guarantee a deferral will be granted. Misrepresentation of facts to gain a deferral is a serious breach of the Code of Student Behaviour.