

Faculty of Science Course Syllabus
Department of Biology
BIOL 3327
Entomology
Summer 2022

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.

Instructor(s): Dr. Tatiana Rossolimo *e-mail* trossoli@dal.ca *Office location* TBA
Lectures: *Time* 9:05-11:55 *Mon-Sat* *Location* Studley LSC-COMMON AREA 244
Laboratories: *Time*, 13:05-16:55 *Location* B2100

Field trips: June 19 Musquodoboit Harbour; June 24 McNabs Island; June 28 Stanley airport and Upper Sackville

Course Description

The course is an introduction to the study of insects. Topics include insect classification, evolutionary diversity, biology, ecology, behaviour, and various applied aspects. Through this survey of the insects, students will gain an appreciation of insect biodiversity as well as their economic and ecological importance.

This class is also available for online delivery, please contact the instructor for more information. Please refer to Brightspace announcement page for any updates regarding delivery and any other changes.

Course Prerequisites

BIOL 2003.03

Overview

Insects are the most biodiverse group of organisms on the Earth. They far surpass other terrestrial animals in abundance of individuals and numbers of species, and they occur practically everywhere. Several hundred thousand different kinds of insects have been described - three times as many as there are in the rest of the animal kingdom. The total number of different species of insects may approach 30 million. Insects have lived on the Earth for at least 350 million years and during this time have evolved in many directions to become adapted to life in almost every type of terrestrial and freshwater habitat. Insects are extremely valuable to humans, and society could not exist in its present form without them. Many species of crop plants are pollinated by insects, some other species are pests, because they consume crops or stored food, are associated with the transmission of diseases, or interfere with some other human purpose.

Course Objectives/Learning Outcomes

In this class students will learn about the role of insects in nature. Specific topics will include the systematics and evolution of insects, their relationships with plants and animals, their value in economics, and their anatomy, physiology, development, life cycles, ecology, distribution, behaviour, classification, nomenclature, and identification. The class includes four field trips for the collecting of insects, following sorting, identifying, labeling and preliminary analysis of data on taxons and trophic group's distribution in several habitats of NS.

Course Materials

- *TEXTBOOKS (not mandatory)*
- 1. Borror, D.J., C. A. Triplehorn, N. F. Johnson, 1997. *Introduction to the Study of Insects*. 6-th edition. 800 p. Hbj College & School Div; ISBN: 0030253977.
- 2. Johnson, N., C. Triplehorn, 2004. *Borror and DeLong's Introduction to the Study of Insects* Hardcover 2004. 888 p. Publisher: Brooks Cole; 7th edition. ISBN-10 : 0030968356.
- 3. McGavin, G.C., 2001. *Essential Entomology*. 318 p. Oxford University Press, ISBN: 0198500025.

Course website: <http://tatiana.rossolimo.com/entomology/>

Course Assessment

Two quizzes (25% each, 50% total) and final lab exam (30%) will cover subjects from lectures, labs, and text reading. The final lab exam will be a comprehensive exam including all taxa from the beginning to the end of the course. The exam and quizzes include a wide variety of questions and problems, based on insects' morphology, anatomy, physiology, development, ecology, behavior, taxonomy and importance for humans.

Do not miss the exam. Any make-up exam (by prior arrangement or in dire emergency) will consist of a two hour oral examination covering the same general areas of the written exam.

The remainder of the grade is based on the laboratory work and collection of insects with proper identification and labeling of specimens (20%). Guidelines on the collection will be given in lab.

June 6 - quiz 1 (13:05-14:00)

June 10 – quiz 2 (13:05-14:00)

June 15 – collection submission (16:00)

June 16 - lab exam 10 am

Component	Weight (% of final grade)	Date
<i>Tests: Quiz 1</i>	25%	<i>June 22</i>
<i>Quiz 2</i>	25%	<i>June 26</i>
<i>Lab exam</i>	30%	<i>June 30</i>
<i>Insect collection</i>	20%	<i>June 28</i>

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (<50)
A- (80-84)	B- (70-72)	C- (55-59)	

Course Policies

Do not miss the exam. Any make-up exam (by prior arrangement or in dire emergency) will consist of a two hour oral examination covering the same general areas of the written exam.

Course Schedule (tentative – may change due to weather, etc.)

June 1

Lecture 3 hours

Theme: Place of Insects in Nature and Taxonomical Position.

Theme: Evolution of Insects. Relationships with Plants and Animals. Value of Insects in Economics.

Lab 4 hours

Instructions on the microscope's construction and use

Greenhouse, Dalhousie campus

Work with collection of insects: Orders, Families, and Species

June 2

Lecture 3 hours

Theme: Classification, Nomenclature, Identification.

Theme: Phylum Arthropoda

Trilobita

Chelicerata: Classes Merostomata, Arachnida

Crustacea: Classes Branchiopoda, Copepoda, Ostracoda, Cirripedia, Malacostraca

Atelocerata: Classes Diplopoda, Chilopoda, Pauropoda, Symphyla.

Class Hexapoda. Classification, Phylogeny.

The Entognathous Hexapods; Protura, Collembola, Diplura.

The Aptorygote Insects: Microcoryphia, Thysanura.
Theme: Order Ephemeroptera: Mayflies
Order Odonata: Dragonflies and Damselflies
Lab 4 hours

June 3

Field trip to Musquodoboit Harbour, Lawrence town beach (9:00-16:00)
Lab – 1 hour

June 4

Lecture 3 hours
Order Grylloblattaria: Rock Crawlers.
Order Phasmida: Walkingsticks and Leaf Insects
Theme: Order Orthoptera: Grasshoppers, Crickets, Katydid
Order Mantodea: Mantids
Theme: Order Blattaria: Cockroaches
Order Isoptera: Termites
Order Dermaptera: Earwigs
Lab – 4 hours
Diversity of insects

June 6

Lecture 3 hours
Order Embiidina: Web-Spinners
Order Plecoptera: Stoneflies
Order Zoraptera: Zorapterans
Order Psocoptera: Psocids
Order Phthiraptera: Lice

Lab 4 hours

Quiz 1

June 7

Lecture 3 hours
Theme: Development and Life Cycles
Theme: Ecology, Distribution, Behaviour.
Theme: Anatomy and Physiology of Insects. Morphology.
Theme: Anatomy and Physiology of Insects. Anatomy and Physiology
Theme: Order Hemiptera: Bugs
Order Homoptera: Cicads, Hoppers, Psyllids, Whiteflies, Aphids and Scale Insects.
Order Thysanoptera: Trips
Lab 4 hours
Identifying of Apterogota, Holometabola (Pterygota)
Sorting of field samples

June 8

Field trip to McNab's Island (9:00 – 16:00)
Lab – 1 hour

June 9

Lecture - 3 hours
Theme: Order Neuroptera: Alderflies, Dobsonflies, Fishflies, Snakeflies, Lacewings, Antlions, Owlflies
Theme: Order Coleoptera: Beetles

Lab - 4 hours

*Identifying of Apterogota, Holometabola (Pterygota)
Sorting of field samples*

June 10

Lecture - 3 hours

*Theme: Order Strepsiptera: Twisted-Wing Parasites
Order Mecoptera: Scorpionflies, Hangingflies
Order Siphonaptera: Fleas*

Lab - 4 hours

*Identifying of arthropods, Entognatha, Apterigota and Hemimetabola orders
Identifying of Holometabola orders*

Lab 4 hours

Quiz 2

June 12

Lecture – 3 hours

Theme: Order Diptera

Order Tricoptera: Caddisflies

Theme: Order Lepidoptera: Butterflies, Moths.

Theme: Order Hymenoptera: Sawnflies, Parasitic Wasps, Ants, Wasps, Bees

Lab - 4 hours

Sorting, identifying, labeling of the field samples.

Revising material for the lab exam

June 13

Field trip to Stanley airport and Upper Sackville - – full day (9:00 – 16:00)

Lab 1 hour

June 14

Lecture 3 hours

Theme: Order Hymenoptera: Sawnflies, Parasitic Wasps, Ants, Wasps, Bees

Lab - 4 hours

Sorting, identifying, labeling of the field samples.

Revising material for the lab exam

June 15

Lab - 4 hours

Sorting, identifying, labeling of the field samples.

Revising material for the lab exam

Collection submission 16:00

June 16

Lab exam

Insect buffet

Laboratory exercises and field trips include collecting insects in natural habitats, sorting and identifying of collected specimens. There are four field trips to the forest, beach, wildlife shelter, for collecting insects.

What to bring on field trips

List of things students should bring on field trips:

backpack, field notebook, pencils, paper, apparel, footwear, lunch, water, snacks

killing jar, insect net, paper envelopes for Lepidoptera, plastic test tubes, jar for aquatic specimens, Ziploc bags

ACCOMMODATION POLICY FOR STUDENTS

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic protected under Canadian Human Rights legislation. The full text of Dalhousie's Student Accommodation Policy can be accessed here:

http://www.dal.ca/dept/university_secretariat/policies/academic/student-accommodation-policy-wef-sep--1--2014.html

Students who require accommodation for classroom participation or the writing of tests and exams should make their request to the **Advising and Access Services Centre (AASC)** prior to or at the outset of the regular academic year. More information and the *Request for Accommodation* form are available at www.dal.ca/access.

ACADEMIC INTEGRITY

Academic integrity, with its embodied values, is seen as a foundation of Dalhousie University. It is the responsibility of all students to be familiar with behaviours and practices associated with academic integrity. Instructors are required to forward any suspected cases of plagiarism or other forms of academic cheating to the Academic Integrity Officer for their Faculty.

The Academic Integrity website (<http://academicintegrity.dal.ca>) provides students and faculty with information on plagiarism and other forms of academic dishonesty, and has resources to help students succeed honestly. The full text of Dalhousie's *Policy on Intellectual Honesty and Faculty Discipline Procedures* is available here:

http://www.dal.ca/dept/university_secretariat/academic-integrity/academic-policies.html

STUDENT CODE OF CONDUCT

Dalhousie University has a student code of conduct, and it is expected that students will adhere to the code during their participation in lectures and other activities associated with this course. In general:

“The University treats students as adults free to organize their own personal lives, behaviour and associations subject only to the law, and to University regulations that are necessary to protect

- the integrity and proper functioning of the academic and non – academic programs and activities of the University or its faculties, schools or departments;
- the peaceful and safe enjoyment of University facilities by other members of the University and the public;
- the freedom of members of the University to participate reasonably in the programs of the University and in activities on the University's premises;
- the property of the University or its members.”

The full text of the code can be found here:

http://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

SERVICES AVAILABLE TO STUDENTS

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise, are free.

Service	Support Provided	Location	Contact
General Academic Advising	Help with - understanding degree requirements and academic regulations - choosing your major - achieving your educational or career goals - dealing with academic or other difficulties	Killam Library Ground floor Rm G28 <i>Bissett Centre for Academic Success</i>	In person: Killam Library Rm G28 By appointment: - e-mail: advising@dal.ca - Phone: (902) 494-3077 - Book online through MyDal

Dalhousie Libraries	Help to find books and articles for assignments Help with citing sources in the text of your paper and preparation of bibliography	Killam Library Ground floor Librarian offices	In person: Service Point (Ground floor) By appointment: Identify your subject librarian (URL below) and contact by email or phone to arrange a time: http://dal.beta.libguides.com/sb.php?subject_id=34328
Studying for Success (SFS)	Help to develop essential study skills through small group workshops or one-on-one coaching sessions Match to a tutor for help in course-specific content (for a reasonable fee)	Killam Library 3rd floor Coordinator Rm 3104 Study Coaches Rm 3103	To make an appointment: - Visit main office (Killam Library main floor, Rm G28) - Call (902) 494-3077 - email Coordinator at: sfs@dal.ca or - Simply drop in to see us during posted office hours All information can be found on our website: www.dal.ca/sfs
Writing Centre	Meet with coach/tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster) - Learn to integrate source material into your own work appropriately - Learn about disciplinary writing from a peer or staff member in your field	Killam Library Ground floor Learning Commons & Rm G25	To make an appointment: - Visit the Centre (Rm G25) and book an appointment - Call (902) 494-1963 - email writingcentre@dal.ca - Book online through MyDal We are open six days a week See our website: writingcentre.dal.ca

Faculty of Science Course Syllabus (Section B) (revised June-2018)

BIOL3327 Entomology

University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate,

violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

Statement: <http://www.dal.ca/cultureofrespect.html>

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca).

Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)

https://www.dal.ca/academics/important_dates.html

University Grading Practices

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Missed or Late Academic Requirements due to Student Absence (policy)

https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html

Student Resources and Support

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: <https://libraries.dal.ca/>

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>

Fair Dealing Guidelines <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

Other supports and services

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html

Student Advocacy: <https://dsu.ca/dsas>

Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety

Biosafety: <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

Radiation Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>