

Faculty of Science Course Syllabus
Department of Biology
BIOL 3327
Entomology
Summer 2017

Instructor(s): Tatiana Rossolimo e-mail trossoli@dal.ca Office location TBA

Lectures: Time 9:05-11:55 Mon-Sat Location Studley LSC-COMMON AREA C334

Laboratories: Time, 13:05-16:55 location B2102

Field trips: May 30 Musquodoboit Harbour; June 2 McNabs Island; June 7 Hammonds plains; June 10 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.

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. 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 3- quiz 1 (13:05-14:00)

June 9 – quiz 2 (13:05-14:00)

June 12 – collection submission (16:00)

June 13- lab exam 10 am

Component	Weight (% of final grade)	Date
<i>Tests: quiz 1</i>	25%	<i>June 3</i>
<i>Quiz 2</i>	25%	<i>June 9</i>
<i>Lab exam</i>	30%	<i>June 13</i>
<i>Insect collection</i>	20%	<i>June 12</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.)

May 29

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 microscopes construction and use

Greenhouse, Dalhousie campus

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

May 30

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

Lab – 1 hour

May 31

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 Apterygote Insects: Microcoryphia, Thysanura.

Theme: Order Ephemeroptera: Mayflies

Order Odonata: Dragonflies and Damselflies

Lab 4 hours

June 1

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

DNA extraction

June 2

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

Lab – 1 hour

June 3

Lecture 3 hours

Order Embiidina: Web-Spinners

Order Plecoptera: Stoneflies

Order Zoraptera: Zorapterans

Order Psocoptera: Psocids

Order Phthiraptera: Lice

Quiz 1

June 5

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 6

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 7

Field trip to Hammonds plains, Upper Tantallon (9:00-16:00)

Lab – 1 hour

June 8

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

Sorting of field samples

DNA- PCR

June 9

Lecture – 3 hours

Theme: Order Diptera

Order Tricoptera: Caddisflies

Theme: Order Lepidoptera: Butterflies, Moths.

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

Quiz 2

Lab - 4 hours

Sorting, identifying, labeling of the field samples.

Revising material for the lab exam

June 10

Field trip to Stanley airport and Upper Sackville - – full day (8:00 – 16:00)

Lab 1 hour

June 12

DNA – gel

Insect collection submission

June 13

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	<p>Help to find books and articles for assignments</p> <p>Help with citing sources in the text of your paper and preparation of bibliography</p>	<p>Killam Library Ground floor</p> <p>Librarian offices</p>	<p>In person: Service Point (Ground floor)</p> <p>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</p>
Studying for Success (SFS)	<p>Help to develop essential study skills through small group workshops or one-on-one coaching sessions</p> <p>Match to a tutor for help in course-specific content (for a reasonable fee)</p>	<p>Killam Library 3rd floor</p> <p>Coordinator Rm 3104</p> <p>Study Coaches Rm 3103</p>	<p>To make an appointment:</p> <ul style="list-style-type: none"> - 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 <p>All information can be found on our website: www.dal.ca/sfs</p>
Writing Centre	<p>Meet with coach/tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster)</p> <ul style="list-style-type: none"> - Learn to integrate source material into your own work appropriately - Learn about disciplinary writing from a peer or staff member in your field 	<p>Killam Library Ground floor</p> <p>Learning Commons & Rm G25</p>	<p>To make an appointment:</p> <ul style="list-style-type: none"> - Visit the Centre (Rm G25) and book an appointment - Call (902) 494-1963 - email writingcentre@dal.ca - Book online through MyDal <p>We are open six days a week</p> <p>See our website: writingcentre.dal.ca</p>