

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 C240

Laboratories: Time 13:05-16:55 Location: B2100

Field trips: May 18 – Tantallon, Hammond's plains; May 22 – Burnside, SMT/Cole Harbour; May 26 – Saint Margaret's Bay Road/Frogs Pond/York Redoubt

Course Description

Medical Entomology covers direct injuries caused by arthropods such as phobias, annoyance, allergies, toxins, venoms and myiasis, arthropod transmission of vertebrate parasites, epidemiology of arthropod-borne diseases. Students study transmission of diseases, methods of surveillance of diseases, management by vector control and other methods of arthropod-borne diseases.

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

Course Prerequisites

BIOL 2003.03 or permission of instructor

Overview

Arthropod borne diseases such as malaria, yellow fever, dengue, west Nile virus, Lyme disease, filariasis and many others continue to cause human suffering and death. Problems in animal production, pets and wildlife caused by arthropods continue to cause financial losses. In last two decades the invasion of exotic pests and pathogens has presented a new problem in many countries including Canada and USA.

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Course Objectives/Learning Outcomes

Students will study transmission of diseases, methods of surveillance for diseases, management by vector control and other methods of prevention of arthropod borne diseases.

Course Materials

- **BOOKS** (not mandatory):

Mullen, G. and L. Durden. 2009 (or 2002). Medical and Veterinary Entomology. Elsevier Science Academic Press, New York, NY. ISBN 0-12-510451-0. ISBN 0123725003

Eldridge, B.F., J. D. Edman, 2004. Medical Entomology. A textbook on public health and veterinary problems caused by arthropods. Ed. B.F.Eldridge, J.D.Edman. Kluwer Academic Publishers. 672 p. ISBN 1402017944

Marquardt and others (eds) 2004. The Biology of Disease Vectors. Elsevier Academic Press, New York, NY. 2nd edition, ISBN 0-12-473276-3 (Ch. 1,2 and 19)

Kettle, D.S. 1995. Medical and Veterinary Entomology. 2nd edition. CAB International. New York, NY.

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

Course Assessment

Two quizzes (20% each, 40% 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 direct injuries caused by arthropods, arthropod transmission of vertebrate parasites, epidemiology of arthropod born diseases, transmission of diseases, methods of surveillance for diseases, management by vector control and other methods of prevention of arthropod born diseases.

The remainder of the grade is based on the laboratory work – collection submission (15%) and presentation in the class on the library research or individual research (10%). Also 5% of the grade will be based on the lab assignments and attendance. Topic for the presentation must be approved.

May 21 – quiz 1 (13:05-14:00)

May 27 – quiz 2 (13:05-14:00)

May 29 – insect collection submission (16:00)

May 30 – lab exam 10 am

Component	Weight (% of final grade)	Date
Tests: Quiz 1	20%	May 21
Quiz 2	20%	May 27
Lab exam	30%	May 30
Insect collection	15%	May 29
Presentation	10%	May 20-25
Lab work	5%	

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 15

Lecture 3 hours:

Introduction to course

Arthropods

Classification

Morphology, anatomy, physiology, behavior, biology.

Life cycles, reproduction, development

Lab 4 hours:

Introduction to collections, diversity of Arthropods important for human and animal health.

Morphology, anatomy.

Video

May 16

Lecture 3 hours:

Historical Public health and vector-borne diseases, direct injury by arthropods

Introduction to the classes of vector borne pathogens, Arachnids, scorpions, spiders, etc. of medical importance

Lab 4 hours:

Araneae. Arachnids, scorpions, spiders, etc. of medical importance, transmitted diseases, bite reactions.
Video

May 18
Victoria Day

May 19
Field trip to Hammonds plains and Tantallon area Full day: 9:05 – 16:00
Lab -16:00-17:00

May 20
Lecture 3 hours:
Historical Public health and vector-borne diseases, direct injury by arthropods
Introduction to the classes of vector borne pathogens, Arachnids, scorpions, spiders, etc. of medical importance
Lab 4 hours:
Araneae. Arachnids, scorpions, spiders, etc. of medical importance, transmitted diseases, bite reactions.
Video
PRESENTATIONS

May 21
Lecture 3 hours:
Host-parasite interactions, evolution of the blood feeding habit
Tick biology and behavior
Ticks and disease. Lyme disease, Alkhurma virus (KFDV), Kyasanur forest disease, Babesia, Human ewingii ehrlichiosis, Human granulocytic ehrlichiosis, Scrub typhus
Emerging tick-borne infections.
Mites and disease typhus, scabies, Demodex -hair follicle mites, face mites, Cats Mange.
Lyme disease

Lab 4 hours:
Quiz 1
Acari. Ticks and disease. Mites and disease
Video
Sorting, identifying and organizing collected arthropods
PRESENTATIONS

May 22
Field trip to Salt Marsh Trail and Cole Harbour Full day: 9:05 – 16:00
Lab -16:00-17:00

May 23
Lecture 3 hours:
Blattaria, cockroaches. Gastroenteritis, allergies, watery eyes, skin rashes, congestion of nasal passages and asthma.
Hemiptera. Bed bugs, kissing bugs and disease, Chagas disease, allergies, bite reaction.
Lab 4 hours:
PRESENTATIONS
Hemiptera, disease and bite reaction.
Phthiraptera, Siphonaptera, disease and bite reaction.
Video
Sorting, identifying and organizing collected arthropods

May 25
Lecture 2 hours:
Phthiraptera. Lice and disease. Typhus.

Siphonaptera. Fleas and disease. Bubonic plague, Typhus

May 26

*Field trip to Saint Margarets Bay Road, Frogs pond, and York Redoubt. Full day: 9:05 – 16:00
Lab -16:00-17:00*

May 27

Lecture 3 hours:

Nematoceros Diptera (black flies, midges, sand flies, biting midges).

Leishmaniasis and Onchocerciasis.

Adult and larval mosquito ecology

Mosquitoes and malaria

Mosquitoes and arboviruses (Yellow fever and dengue)

Mosquitoes and arboviruses (West Nile and other arboviral infections)

Mosquitoes and filariasis

Lab 4 hours:

Quiz 2

PRESENTATIONS

Hemiptera, disease and bite reaction.

Phthiraptera, Siphonaptera, disease and bite reaction.

Video

Sorting, identifying and organizing collected arthropods

Diptera part 2

May 28

Lecture 3 hours:

Diptera (Brachycera: Muscidae, horse flies, stable flies) of Veterinary Importance

Development of Research on Emerging Vector-borne infections

Mating biology of Diptera: implications for vector biology

Epidemiology and transmission cycles, Vector borne disease surveillance and control strategies.

Genetically modified mosquitoes, future challenges in public health

Myiasis -infection by parasitic fly larvae that feed on their host living/dead tissue.

Botflies, Sheep Ked,

Lab 4 hours:

Presentations

Chilopoda/Diplopoda

Video

May 29

Review of slides and collections

Finalize insect collections, identification, organizing, sorting

16:00 - Collection submission

May 30

Final lab exam

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 Bissett Centre for Academic Success	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)

BIOL3328 Medical 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>