

Department of Biology Course Outline

SC/BIOL 3030 4.00 Physiology of the Invertebrates
Fall 2021/2022

Course Description

A treatment of the physiology of major invertebrate phyla with emphasis on interphyletic relationships. Laboratory exercises address the diversity and physiology of invertebrates. Three lecture hours, three laboratory hours. One term. Four credits.

Prerequisites

SC/BIOL 2030 4.00.

Course Instructors and Contact Information

Course Director

Dr. Andrew Donini
205 Lumbers Building
adonini@yorku.ca

Teaching Assistants

To be determined

Schedule

Lecture Times: Lectures will be pre-recorded and posted on EClass.

Lab Times: There are 2 in-person labs and 2 virtual labs in this course. The in-person labs run during regularly scheduled lab period on the week that the lab runs for your lab group. Each lab group will be divided into two such that only 10 people will be in lab at a time. One of the two groups will complete the lab during the designated week and the other group will complete it the following week:

Lab 1: The weeks of September 20th and 27th

Lab 2: The weeks of October 18th and 25th.

Assessment for these 2 labs will be through formal lab reports which are due 1 week after you complete the in-person lab.

The 2 virtual labs which can be viewed as many times as you like on Eclass with data provided on Eclass will be assessed with a Results section for each lab.

Evaluation

Online Tests and quizzes; Lab Exercise Reports

October 19, 2021: Lecture Test	(20%)
Final Exam	(40%)
Formal Lab Report 1 (Due 1 week after completing in person lab)	(15%)
Formal Lab Report 2 (Due 1 week after completing in person lab)	(15%)
Virtual Lab 1 Results (Due November 12 th)	(5%)
Virtual Lab 2 Results (Due November 19 th)	(5%)

Important Dates

See Evaluation above for due dates of labs, tests and quiz.

Drop Deadline: November 12th, 2021

Course Withdrawal: November 13th to December 7th, (withdraw from course and receive a grade of "W" on transcript)

NOTE: for additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at [Undergraduate Fall/Winter 2021-2022 Important Dates | Registrar's Office | York University](#)

Resources

There is no text book for this course. Most lecture material is sourced from primary literature (published, peer reviewed papers) and from books which are in the Steacie Science and Engineering Library.

EClass website: Classes are recorded and posted. Extra resources (e.g. videos, pictures) may be posted for classes and lab exercises.

Lab Exercises are posted as videos on EClass.

Learning Outcomes

Upon successful completion of this course, students should be able to:

1. Explain how specific invertebrates are important to our society from an economic standpoint and from a health perspective.

Assessment: tests, assignments, lab reports

2. Describe the morphology and associated physiology of invertebrate adaptations to locomotion, feeding, the maintenance of solute balance, extreme environments and the processing of sensory information through the nervous system.

Assessment: tests and virtual laboratory exercises, lab reports.

3. Describe and carry out various experimental techniques and explain how to apply them to solve physiological questions.

Assessment: virtual laboratory exercises, in person laboratory excercises, lab reports, tests

4. Write concise, clear descriptions of physiological processes and write concise, clear scientific reports including analysis and presentation of data.

Assessment: tests, reports

Course Content

The invertebrates are a medically, economically and ecologically important group of animals. A number of invertebrates act as pathogens or vectors of disease. Malaria is one of the most important diseases in the world and is caused by a protozoan that is transmitted by anopheline mosquitoes. Economically speaking, invertebrates can be detrimental, serving as pests that destroy crops, but can also benefit us by serving as sources of food (eg. shrimp, lobster). Ecologically, invertebrates are an integral part of the food chain and can be utilized as bioindicators. Therefore, it is in our best interest to study and understand the unique physiological processes of each phylum.

Lecture Schedule:

Sept 9: Introduction
Sept 14: Importance of Invertebrates
Sept 16: Physiology defined
Sept 21: Classification of Invertebrates
Sept 23: Unicellular Eukaryotes, Osmoregulation
Sept 28: Unicellular Eukaryotes, Locomotion
Sept 30: Unicellular Eukaryotes, Feeding
Oct 5: Porifera
Oct 7: Porifera II
Oct 19: Lecture Test
Oct 21: Arthropoda Endocrinology of Malpighian tubule function
Oct 26: Arthropoda Endocrinology of Molting
Oct 28: Arthropoda Endocrinology of Ecdysis
Nov 2: Cnidaria Cell types and nematocyst discharge
Nov 4: Cnidaria nematocysts discharge and anthozoan aggression
Nov 9: Mechanoreceptors of Nematodes
Nov 11: Tubeworms: survival in extreme environments
Nov 16: Mollusca Squid jet propulsion
Nov 18: Mollusca Chromatophores, Iridiphores
Nov 23: Regeneration in Flatworms
Nov 25: Echinoderms: Regeneration and Photoreceptor cells
Nov 30: Ammonia excretion mechanisms of invertebrates
Dec 2: Bioluminescence of invertebrates
Dec 7: Review

Lab Schedule:

Week of September 20th In person Lab 1 (half the class)
Week of September 27th In person Lab 1 (the other half of the class)
Week of October 18th In person Lab 2 (half the class)
Week of October 25th In person Lab 2 (the other half of the class)
Virtual Labs on Eclass: view videos, obtain data from Eclass

Experiential Education and E-Learning

Supplementary lecture material on EClass.
In-person Laboratories and virtual laboratories on EClass.

Other Information

None

Course Policies

Policy for Test:

- There is 1 Test, Oct. 19th worth 20% of the final course mark.
- *If you miss the test, you will be invited for a make-up test which will be in the form of a virtual discussion over zoom with the course instructor.*
- *There are NO EXCEPTIONS to this Policy. No explanation or documentation is requested or required for missing tests. The Policy will be applied as outlined above.*

Policy for Final Exam:

- The final exam is worth 40% of the final course mark and is scheduled by the Registrar during the Fall exam period in December.
- *If you miss the exam you will have to submit a formal request for deferred standing.*

Policy for Laboratories:

- There are 2 in-person laboratories and students must complete these laboratories in person in order to pass the course (see learning outcome # 3 above).
- If you miss an in-person laboratory you may not be able to pass the course. At the sole discretion of the course director you might be able to receive some data to allow you to write the associated lab report but the maximum grade you could receive in this case is 50% (if you earn 100% on the written report).
There are NO EXCEPTIONS to this Policy. If you miss an in-person lab you MUST contact the course director the day that you miss the lab, you will not be able to pass the course if you fail to contact the course director on the day that you miss the lab.

Policy on Late Laboratory Reports:

- There are 2 formal lab reports, 1 each for the in-person laboratories.
- You are provided with 1 week from the time you complete the laboratory to the time the report is due for each of the reports.
- There are 2 virtual lab results section with small discussion. Virtual labs can be viewed as many times as you like during a 1 week period on Eclass. Data will be provided on Eclass. The reports are due at the end of the 1 week period.
- You **MUST** submit an **electronic version of your reports on your lab section's specific link on EClass** by the **Due DATE and TIME**.
- If you submit a report **AFTER the Due DATE and TIME**, 10% of the final earned grade will be deducted for each day that it is late.

There are NO EXCEPTIONS to this Policy. No explanation or documentation is requested or required for late laboratory reports. The Policy will be applied as outlined above. There are no extensions of due dates.

University Policies

Academic Honesty and Integrity

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (<http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students' research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - <http://www.yorku.ca/academicintegrity/>

A note on sharing assignments, tests, exams:

Numerous students in Faculty of Science courses have been charged with academic misconduct when materials they uploaded to third party repository sites (e.g. Course Hero, One Class, etc.) were taken and used by unknown students in later offerings of the course. The Faculty's Committee on Examinations and Academic Standards (CEAS) found in these cases that the burden of proof in a charge of aiding and abetting had been met, since the uploading students had been found in all cases to be wilfully blind to the reasonable likelihood of supporting plagiarism in this manner. Accordingly, to avoid this risk, students are urged not to upload their work to these sites. Whenever a student submits work obtained through Course Hero or One Class, the submitting student will be charged with plagiarism and the uploading student will be charged with aiding and abetting. Note also that exams, tests, and other assignments are the copyrighted works of the professor assigning them, whether copyright is overtly claimed or not (i.e. whether the © is used or not). Scanning these documents constitutes copying, which is a breach of Canadian copyright law, and the breach is aggravated when scans are shared or uploaded to third party repository sites.

Access/Disability

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Students in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. **Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.**

Additional information is available at the following websites:

Counselling & Disability Services - <http://cds.info.yorku.ca/>

Counselling & Disability Services at Glendon - <http://www.glendon.yorku.ca/counselling/personal.html>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

Ethics Review Process

York students are subject to the York University *Policy for the Ethics Review Process for Research Involving Human Participants*. In particular, students proposing to undertake research involving human participants (e.g., interviewing the director of a company or government agency, having students complete a questionnaire, etc.) are required to submit an *Application for Ethical Approval of Research Involving Human Participants* at least one month before you plan to begin the research. If you are in doubt as to whether this requirement applies to you, contact your Course Director immediately.

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. **Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately.**

Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre or online at http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf (PDF)

Student Conduct in Academic Situations

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-and-or-harassing-behaviour-in-academic-situations-senate-policy/>

