

Department of Biology Course Outline

SC/BIOL 3030 4.00 Physiology of the Invertebrates
Fall 2020/2021

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 (strictly enforced)

SC/BIOL 2030 4.00.

Course Instructor(s) and Contact Information

Course Director

Dr. Leena Thorat
205 Lumbers Building
leenat@yorku.ca

Teaching Assistants

Britney Picinic [britneyp@my.yorku.ca]
&
Nora Romero [norarom@yorku.ca]

Schedule/Course Format

Lecture Times: Tuesday and Thursday: 8:30 to 10.00 am
Lectures will be delivered synchronously via Zoom (as scheduled).
Recorded lectures, lecture notes and assignments will be posted on Moodle.

Lab Times: Tuesday, Wednesday, Thursday or Friday 2:30 to 5:30 pm
Labs will be a mix of both, synchronous and asynchronous formats.
Labs are a mandatory component of BIOL 3030. You **MUST** participate in the lab section during the schedule times in which you are registered.

Tutorials:

Tutorials will be conducted asynchronously.

Further details on schedule times and delivery formats will be available on the Moodle page a week before classes start.

Technology Requirements

Camera, high speed internet, microphone, recommended web browsers (Mozilla Firefox v20.0 or Google Chrome v25.0 or higher).

Evaluation

Lecture Test 1- 20%
Lecture Test 2- 20%
Lecture Test 3- 20%

Lab Report 1- 7%
Lab Report 2- 7%
Lab Report 3- 7%
Lab Report 4- 7%

Reports are required for all the four laboratories.

Pre-lab quiz (4 x 0.5% each)- 2%

Tutorial 1- 5%
Tutorial 2- 5%

#Possibility of additional evaluation: Any student found guilty of violating the standards of academic honesty or any suspicious login activity or other suspicious activity during the tests and tutorials, will have to give an additional oral exam in order to verify his/her understanding level of the study material.

**Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.*

Important Dates

See Evaluation above for due dates of labs and exams.

Drop Deadline: 3rd November' 20

Course Withdrawal: 4th November to 4th December (withdraw from course and course still appears on transcript with 'W').

NOTE: for additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at <https://registrar.yorku.ca/enrol/dates/fw20>

Resources

There is no text book for this course. Most lecture material is sourced from primary literature (published, peer reviewed papers) and from books (more information will be shared during classes).

All lecture material (slides, recorded lectures, extra resources and assignments) will be posted a day before the class.

There is no lab manual. Lab protocols will be posted on Moodle and students are expected to download (and print them, if required) prior to the lab session allotted to them.

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: written tests and lab reports

Self-evaluation activity: assignments (crossword puzzles/ quizzes)

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

Assessment: written tests, virtual laboratory exercises with associated written reports.

Self-evaluation activity: assignments (crossword puzzles/ quizzes).

3. Enhance critical data analysis and interpretation skills through virtual laboratory exercises and explain how to apply them to solve physiological questions.

Assessment: virtual laboratory exercises with associated written reports, tutorials, pre-lab quizzes and written tests.

Self-evaluation activity: assignments (crossword puzzles/ quizzes).

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

Assessment: written tests, laboratory reports, tutorials and pre-lab quizzes.

Self-evaluation activity: assignments (crossword puzzles/ quizzes).

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. For instance, 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 (e.g. 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 invertebrate phylum.

Physiology of the Invertebrates

Introduction

Importance of Invertebrates
Invertebrate Physiology
Classification of Invertebrates

Unicellular Eukaryotes

Osmoregulation
Locomotion
Feeding

Porifera

Cell types, Architecture
Glass sponge, Histoincompatability, Reproduction

Ammonia Excretion in Invertebrates

Ammonia Production
Mechanisms of Ammonia Excretion

October 1st: LECTURE TEST 1

October 6th: LAB TUTORIAL 1

Cnidaria

Cell types, nematocyst discharge
Finish nematocyst discharge, Anthozoan aggression

October 10th-16th: FALL READING WEEK (No lectures/labs)

Platyhelminthes

Regeneration in Flatworms

Nematoda

Mechanoreception

Annelida

Feeding & Reproduction

November 3rd: LECTURE TEST 2

November 26th: LAB TUTORIAL 2

Mollusca

Squid Jet Propulsion
Chromatophores, Iridiphores

Arthropoda

Endocrinology of Molting
Endocrinology of Ecdysis

Echinodermata

Water vascular system

December 1st: LECTURE TEST 3

Course calendar with exact schedule dates and time for lectures, labs and tutorials will be available on the Moodle page a week before classes start.

Other Information

None

Course Policies

Policy for Tests:

- There are **3 Tests** in total, worth 20% each.
- **For those that write the 3 tests, the following policy may be applied:**
 - test with the highest grade is worth 30%,
 - test with the lowest grade is worth 10%,
 - remaining test is worth 20%.
- **If you miss 1 test:** of the remaining 2 tests, the test with the lowest grade is worth 35% and the test with the highest grade is worth 25%.
- **If you miss 2 tests:** the single test you write will be worth 30% and you will have to give an oral exam worth 30%.
- **If you miss All 3 tests:** you will earn a zero worth 30% and you will have to give an oral exam worth 30%.

**No explanation or documentation is requested or required for missing tests.
The Policy will be applied as outlined above.**

Policy on Laboratories:

- **All laboratories are MANDATORY.**
- There are **4 Laboratory Reports each worth 7%.**
- You will be provided with **2 weeks** from the time you complete the laboratory to the time the report is due for each of the 4 laboratory reports.
- You **MUST** submit an **electronic version of your report on Moodle** via the link provided to you, by the **due date and time.**
- If you submit a report **AFTER the due date and time**, 15% of the final earned grade will be deducted for late submission and you will have to give an oral exam worth 15% to cover up for the loss.
- You will be **permitted only 1 lab switch** (for any one out of the 4 labs) with prior permission from the Course Director.

**No explanation or documentation is requested or required for late laboratory reports.
The Policy will be applied as outlined above.**

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/>

Important A note from the Faculty of Science Committee on Examinations and Academic Standards: 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 - <https://www.glendon.yorku.ca/counselling/>

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

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 and submit an [Examination Accommodation Form](#) at least 3 weeks before the exam period begins. The form can be obtained from Student Client Services, Student Services Centre or online at <https://secure.students.yorku.ca/pdf/religious-accommodation-agreement-final-examinations.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-andor-harassing-behaviour-in-academic-situations-senate-policy/>