

Department of Biology Course Outline

SC/BIOL 3070 4.00 Animal Physiology II
Winter, 2022

Course Description

The processes of digestion, osmoregulation and excretion, circulatory systems and gaseous exchange, metabolism, growth and reproduction are considered. The course adopts a comparative approach, first analyzing the basic principles underlying physiological activities, then examining the means whereby different organisms perform them. Three lecture hours, three laboratory hours. One term. Four credits.

Prerequisites (strictly enforced)

SC/BIOL 2020 3.00, SC/BIOL 2021 3.00, and SC/BIOL 2030 4.00.

Course Instructor(s) and Contact Information

Prof. Jean-Paul Paluzzi, PhD
(416) 736-2100 ext 20999
Department of Biology
Lumbers Building, Rm. 221/221A (lab/office)
Email: biol3070@yorku.ca
Website: www.yorku.ca/paluzzi

Office hours: Friday afternoons at 2:30pm on Zoom - link provided on eClass

Schedule

Lectures: The lectures for this course will normally be delivered **in person** but are scheduled remotely on Zoom up to and including Jan. 21. Links for recorded lectures will be posted as soon as possible (normally, within 24hrs). Office hours are held on Zoom and scheduled on Fridays at 2:30pm. All times in Eastern Standard Time (EST).

Laboratories: Monday, Tuesday, Wednesday or Thursday 2:30-5:30pm – Lumbers, Rm 109 & 110
or Tuesday and Wednesday 10am-1pm – Lumbers, Rm 109 & 110

Evaluation

<u>Grading:</u>	Term Tests (3 @ 20% each) ¹	= 60%
	Laboratory reports ² (4 @ variable weight)	= 36%
	Laboratory quizzes (8 x 0.5% each)	= 4%
		Total 100%

¹**NOTE:** Multiple choice and short/long answer essay style question format that may include some choice and will be based exclusively on lecture and lab material when relevant overlap in content occurs. There will be no lab exam or final exam this semester; term tests may be cumulative but questions will be focused primarily on lecture and laboratory material covered since last test. Term tests will be held in-person (see dates below) during normal class scheduled time. If we pivot to full remote teaching, term tests will be completed on eClass and will include material that must be submitted using Crowdmark.

²**NOTE:** Reports are required for **four (4)** laboratories – the first, second, third and fourth lab reports will be worth 7, 8, 10 and 11%, respectively.

Students are encouraged to refer to the comprehensive document posted on eClass outlining requirements for the lab reports and request clarification by contacting the TA coordinator (farwa@my.yorku.ca). Your TA will inform you whether or not a lab report is required at the end of each lab session. You may also need to review an introductory and explanatory video on eClass **before** each in-person lab and write a short quiz that covers the material in the lab manual for that week. Attendance in and completion of each and every lab is **mandatory!** If you miss a lab due to serious illness or serious emergency, you must make contact (e.g. email) with your TA **and** the TA coordinator within 24hrs of your absence. **N.B. Any missed lab work will be made up and format is at the discretion of the course director (may include oral assessment or extra written assignments such as literature reviews).** Students who miss up to one term test may be permitted to write a make-up test during the official exam period (Apr. 12-29, 2022) at the discretion of the course director. At the discretion of the course director, final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

Important Dates

Term test 1: February 11th, 2022

Term test 2: March 18th, 2022

Term test 3: April 8th, 2022

Drop Deadline: March 18th, 2022 (last day to drop without course on transcript)

Course Withdrawal Deadline: March 19th - April 10th, 2022 (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: <https://registrar.yorku.ca/enrol/dates/2021-2022/fall-winter>

PLEASE NOTE: Should it become necessary to change the mode of delivery of the course temporarily, the date, type and weight of the planned activities could change.

Resources

Textbook: Sherwood L, Klandorf H, and Yancey P. 2012.
(highly recommended) Animal Physiology: From Genes to Organisms. 2nd Edition, Cengage Learning. (Available at the York University Bookstore)
ISBN: 978-0-8400-6865-1 (hard copy or e-book)

Lab manual: All lab material will be posted on the eClass course page and it is essential that students read all information including detailed guidelines on the laboratory component (protocols, expectations, etc.).

Learning Outcomes

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

- evaluate how **physiological** systems work independently and collectively with each other.
- compare the strategies and physiological adaptations used by different animals and the influence of varying environmental conditions that enable **animals** to live within a diverse range of habitats.
- evaluate the biological problems of **animals** comparatively from a physiological viewpoint.
- analyse the effects of internal and external stimuli on the **physiological** functions of cells/tissues/organs.

This course employs a comparative approach to studying various physiological processes in animals. Specifically, the physiology of digestion, osmoregulation, excretion, circulation, gaseous exchange, metabolism, reproduction and growth will be covered in this course. First, the basic principles underlying the specific physiological activities will be explained and then the means by which different organisms perform them will be examined. The laboratory component will provide an opportunity for students to conduct representative experiments from most of the organ systems covered in the lecture. Upon completion, students are expected to have a solid understanding of how selected physiological processes

take place in animals, and to have practiced and developed their scientific writing through data collection, analysis, presentation and interpretation of laboratory results.

Course Content

Blood and Circulatory System

- Anatomy of the circulatory system
- Blood cells
- Heart
- Hemodynamics and peripheral circulation
- Regulation of circulation

Gas exchange

- Gas properties
- Transport of O₂ and CO₂ in the blood
- Gas exchange in air and in water

Iono- and Osmoregulation

- Body fluid composition and exchange of ions and water
- Osmoregulation in aquatic environments
- Osmoregulation in terrestrial environments
- Excretion

Acid/Base Balance

- CO₂ transport and acid/base balance
- Ventilation and acid/base balance
- Excretion and acid/base balance

Feeding, Digestion and Absorption

- Food and feeding
- Alimentary system, gut motility and GI secretion
- Digestion, absorption and excretion

Metabolism

- Metabolic pathways
- Metabolic rate
- Regulation of metabolism

Thermoregulation

- Heat and body temperature
- Thermal regulation in ectotherms
- Thermal regulation in endotherms

Reproduction

- Reproductive strategies
- Sexual determination, differentiation and maturation
- Male reproductive physiology
- Female reproductive physiology
- Fertilization, pregnancy and lactation

Growth

- Body growth (including long bone growth)
- Regulation of postnatal growth

Experiential Education and E-Learning

Relevant supplementary e-learning materials will be linked through lectures posted on eClass and will include animations and other e-resources available with the official course textbook.

Other Information

Lab coats are required for this course and may be purchased at the York University Bookstore.

Safety glasses (also available at the Bookstore) **MUST** be worn when handling hazardous chemicals, biological materials when aerosols are being created, and when using the centrifuge, compressed gases or vacuum equipment. Regular prescription glasses are NOT acceptable as they lack protective side shields and many styles do not sufficiently cover the eyes. Safety glasses can be worn over prescription glasses as can safety goggles (available at hardware stores, e.g. Home Hardware, Canadian Tire).

A **dissection kit** that includes scissors and forceps is also required and may be purchased at the York University Bookstore.

Face masks must be worn for all in-person labs and at all times when indoors. All students must complete the [COVID-19 YU Screen tool](#) **every time you must come to campus**, and do not come to campus if “yes” was answered to any of the screening questions.

Please regularly visit the following link regarding operations and policies at York University during the pandemic: [YU Better Together website](#) (visit on a regular basis as it is updated often)

Technical requirements for taking the course:

Students will need to have a computer (tablets will limit access to material) with stable high-speed internet connection with webcam and microphone (for interacting during any remote lectures and live office hours). As noted above, the majority of lectures will run in person but some synchronous remote sessions will take place the first two weeks of classes and to answer and review questions in real-time (e.g. office hours) or complete course assessments. All lectures will be recorded and posted on eClass (students are not required to have webcam but encouraged for normal interaction during synchronous activities such as review sessions or office hours). Normally, student microphones and web cameras will be turned off during meetings to avoid disruptions.

Course Policies

Missed terms tests or in-person labs:

Any student absent from a term test or in-person lab without a valid medical reason will receive a grade of zero for the test or lab they missed. Make-up tests may be offered at the discretion of the course director.

Students who feel that there are extenuating circumstances that may interfere with their ability to successfully complete the course requirements are encouraged to discuss the matter with Prof. Paluzzi **as soon as possible (no later than Jan. 14th, 2022)**.

Note that despite the ongoing COVID-19 pandemic, this course has been approved for and requires students to attend all in-person labs. Failure to attend the mandatory in-person labs will result in an inability of the student to collect data necessary to complete the associated lab reports. Students must attend the laboratory in order to submit a lab report. Missed labs will be penalized the quiz grade and any associated report for that laboratory.

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 willfully 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, sharing, uploading or publishing 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:

Student Accessibility Services - <https://accessibility.students.yorku.ca>

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 accommodation request form <https://secure.students.yorku.ca/pdf/religious-accommodation-agreement-final-examinations.pdf> at least 3 weeks before the exam period begins.

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/>