science | YORK UNIVERSITÉ UNIVERSITY

Department of Biology Course Outline

SC/BIOL 3060 4.00 Animal Physiology I
FALL 2024

Course Description

Fundamental concepts in animal physiology. Area that will stressed include biophysical, biochemical, cellular and anatomical mechanisms critical for animal function.

Prerequisites

SC/BIOL 2030 4.0; SC/BIOL 2020 4.0; SC/BIO 2021 4.0

Land Acknowledgement

York University recognizes that many Indigenous Nations have longstanding relationships with the territories upon which York University campuses are located that precede the establishment of York University. York University acknowledges its presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, and the Huron-Wendat. It is now home to many First Nation, Inuit, and Métis communities. We acknowledge the current treaty holders, the Mississaugas of the Credit First Nation. This territory is subject of the Dish with One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.

Technical Requirements

You must have access to reliable high-speed internet connection (wi-fi) and a computer to take this course, including access to audio (including microphone) and a web cam. Some aspects of the course will involve video conferencing software (*e.g.* Zoom). Reliable access to eClass and ability to stream videos from eClass are required.

Course Instructors and Contact Information

Course Director: Dr. Michael Cardinal-Aucoin (he/him)
Email: mdca@yorku.ca
Office hours: by appointment, via Zoom

Laboratory coordinator: Marishia Agard (ama432@my.yorku.ca)
Laboratory Technical Staff: Xiaodong Gao (gaoxd@yorku.ca)

Schedule

Lectures: MWF 8:30-9:30am (EST) **Room :** ACW 206

- *We will meet Mondays and Wednesdays every week, unless indicated otherwise.*
- We may sometimes meet via Zoom (link provided on eClass).
- This course will be delivered using a hybrid approach that combines synchronous class meetings and lectures during the scheduled lecture period with asynchronous, inquiry-based flipped classroom elements to be completed independently.

Laboratories: You MUST attend the section that you are officially enrolled in. Check your schedule!

Lab room: Lumbers 109 and 110

- **Labs start the week of Sept. 16, 2024.**
- **Labs are a mandatory component of BIOL 3060 and you must attend the lab section in which you are registered. No exceptions**.
- **If you know you will miss a lab, contact the lab coordinator in advance and we *may* be able to accommodate you in another section that week.**

Evaluation

Component	Date	Value	
Term tests (online via eClass)			
Midterm exam (Units I, II, and II)	Friday, Oct. 25, 2024	= 26%	= 54%
Final exam (Units IV, V, and VI)	TBD, during exam period	= 30%	
Laboratories			
Attendance/participation	Throughout	= 5%	= 32%
3 written lab reports	See course schedule	= 12%	
Lab exam	Friday, Nov. 29, 2024	= 15%	
Discussion Forums			
Discussion Forum 1: Homeostasis	Sept. 4-22	= 3%	= 12%
Discussion Forum 2: Model organisms	Sept. 23-Oct. 13	= 3%	
Discussion Forum 3: Reflexes	Oct. 21-Nov. 10	= 3%	
Discussion Forum 4: Health and disease	Nov. 11-Dec. 1	= 3%	
Total			= 100%

Important Dates

See above for important dates related to course material and see course schedule for additional information.

Drop Deadline: Nov. 8, 2024 (last day to drop without course on transcript)
Course Withdrawal Nov. 9 – Dec. 3 (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/.

Resources

Textbook: Animal Physiology: From Genes to Organisms 2nd Edition (2012) Authors: Sherwood, Klandorf and Yancey, Publisher: Brooks/Cole Cengage Learning. ISBN-978-0-8400-6865-1

- *The textbook is not required.*
- I will also reference this free online Anatomy and Physiology textbook from OpenStax: https://openstax.org/details/books/anatomy-and-physiology.
- All tests will be based on lectures and other course materials.

Learning Outcomes

Upon successful completion of this course, the student will have reliably demonstrated the ability to:

- Develop an improved understanding of the fundamental concepts and principles of animal physiology;
- Gain a deeper understanding the of the relationship between structure and function at the molecular, cellular, system, and organismal levels;
- Understand the basics of membrane permeability, hormonal communication, action potential propagation of nerves, mechanisms of sensory physiology, skeletal muscle activity and kinetics;
- Demonstrate proficiency in experimental design, data collection, statistical analysis, and interpretation of scientific results;
- Improve both oral and written scientific communication skills;
- Cultivate the ability to work as a productive member of a team.

Course Content

This course and its companion course, Biol 3070, provide an overview of the basic principles of animal physiology – they explore how animals function. The physiology of different animals will be compared within an evolutionary context, with a slight focus on vertebrates.

In general, the courses will be organized by physiological systems. Biol 3070 will examine basic cell physiology, the endocrine system, the nervous system (including motor and sensory branches), and the muscular system. Biol 3070 will examine the cardiovascular, respiratory, urinary, digestive, and reproductive systems. Biol 3060 introduces the means by which the processes discussed in Biol 3070 are regulated.

Although the course is organized by systems it is important to remember that the systems function together as a whole, and therefore an integrative approach will be employed throughout. The labs complement and enhance material from lectures, with which they are integrated. They allow you to apply your knowledge and develop an understanding of how physiology is studied.

Topics Covered

- Unifying principles in physiology (e.g. homeostasis)
- Cellular basis of physiology
- Chemistry, biochemistry and cytology of intra- and intercellular communication
- Endocrinology, hormones and regulated behaviour
- Neuronal signalling, conduction and operation of synapse
- Electrical and pharmacological operations of neurons
- Organization of the two nervous systems

- Learning and memory of the brain
- Sensory systems: General and chemoreception, mechanosensing and hearing, etc.
- Neuromuscular junction anatomy and muscle function
- Actin and myosin; sliding filaments, regulation of contraction and muscle diversity
- Muscle fibre types, energy metabolism, and perfusion
- Basic animal behaviours

See the course schedule for detailed information about course content, including readings, due dates, and concurrent labs.

Experiential Education and E-Learning

- This course uses eClass and other online resources throughout.
- The laboratory component of the course is tightly integrated to enhance the learning experience.

Course Policies

Term Test Policy: READ CAREFULLY and ENTIRELY

- There is 1 midterm and 1 final exam. The midterm will take place during the regularly scheduled lecture period. The final exam will take place during the December exam period. They will examine students on lecture material only (i.e. no lab material).
- **There are NO make-up tests for the midterm. If you miss the midterm for a valid and documented reason the value of midterm will be transferred to the final exam.**

Policy for a Missed Final Exam:

- If you miss the final exam you must petition for deferred standing. Information and instructions with forms can be found at http://myacademicrecord.students.yorku.ca/deferred-standing.
- **You Must hand the deferred standing form to the course director within 7 days of missing the exam along with an explanation for the reasons for missing the exam.**
- The format for a deferred final exam may be different from the original format of the exam.

Policy for Laboratories: READ CAREFULLY AND ENTIRELY

- **LABORATORIES ARE MANDATORY AND YOU MUST ATTEND THE LABORATORY SECTION THAT YOU ARE OFFICIALLY ENROLLED IN.**
- There are **5 in person labs and 2 virtual labs that will be held with the TA via Zoom.**
- You receive marks for participation/performance for every lab totalling 10%.
- You will submit 3 lab reports worth 12%: Lab 1 report (2%) and two lab reports of your choice (5% each). Lab reports are due 2 weeks after performing the lab.
- There will be a lab exam worth 15% held during the regularly scheduled lecture time. If you miss the lab exam its value will be transferred to the final exam.

- **There are No make-up labs for individual students.** If you know in advance you will miss a lab, contact the course director 1 week prior to your lab and it *may (or may not)* be possible to accommodate you in another section.
- Make-up labs or make-up graded dissections may be run on the last week of classes where an entire lab section's lab has been cancelled during the term due to unforeseen circumstances (e.g. snow cancellation; under the order of Toronto Public Health).
- **See the lab manual and course schedule for additional information about lab dates and grading.**

Lab Reports

- **Written reports are required for THREE laboratories.**
- You are required to write a report on Lab #1, worth 2% of the final grade. This exercise will introduce you to detailed laboratory report writing and you will be given extensive feedback by your TA that should help you with the other laboratory reports.
- The two other reports are worth 5% each and you can choose ANY TWO exercises to write up from Lab #3 – Lab #7.
- The lab reports are due 2 weeks after performing the lab and will be penalized 10% per day overdue. No lab reports will be accepted after Dec. 3.

Other Information

Learning Environment

Everyone learns more effectively in a respectful, safe, and equitable learning environment free from discrimination or harassment. I invite you to work with me to create a classroom space—both real and virtual—that fosters and promotes values of human dignity, equity, non-discrimination and respect for diversity. These values and practices are in accord with York Universities policies on equity and inclusion promoted by the Centre for Human Rights, Equity and Inclusion (https://rights.info.yorku.ca/). Please feel free to discuss with me any questions or concerns you have about equity in our classroom or in the Lakehead community. If I cannot answer your questions or help you address your concerns, I encourage you to contact the Centre for Human Rights, Equity and Inclusion Human Rights and Equity (https://rights.info.yorku.ca/contact-us/).

Behaviour and Conduct

- Students are expected to ensure that the classroom and laboratory learning environments are inclusive, respectful, peaceful, and safe.
- Interactions and relationships with instructors and other students (in person, online, in email, etc.) within the academic context should be professional and characterized by integrity, courtesy and mutual respect.
- Lectures should be interactive - please get engaged in the material and ask as well as answer questions!
- I fully encourage a reduction in the use of paper but if you bring your laptop to take notes, please refrain from using the internet in class (otherwise you will be banned from bringing your computer).
- Please be considerate in lectures and refrain from talking as it will disturb the learning environment.

- For your benefit and the benefit of students around you, turn your phone off to ensure it does not ring during lecture and to avoid the urge to text or you may be asked to leave the lecture hall.
- Students are expected to attend all lectures and labs.
- Recording devices of any kind are not permitted to be used in lectures.

Email Policies and Etiquette

I will try to respond to email within two working days, but this is not always possible as there are many students and only 1 professor. I may also answer your question in the next class meeting if appropriate. Questions and answers that I deem of interest to the entire class may be posted (anonymously) on eClass or sent via course announcements if urgent. Emails that do not meet the requirements below will not be answered:

- Use your @my.yorku.ca email address when emailing instructors and others within the university. Email from other sources may be filtered out and not reach the intended recipient.
- SUBJECT LINE - Include the course code, and a brief indication of topic.
- Lecture email example: BIOL 2030 – question regarding echinoderms

Include your NAME and STUDENT NUMBER at the end of each email. I work with many students and this facilitates my ability to help you.

Who do I ask what?

The **Course Director** (Dr. Michael Cardinal-Aucoin) will be teaching the course and is the person to ask any questions pertaining to the lectures. Dr. Cardinal-Aucoin can also help with lab material related questions BUT students are encouraged to first ask your TA about lab related material.

Take note of your **TA's** name! Your TA runs your lab section, administers your quizzes, decides your lab performance grade, marks your graded dissections. Your TA is the first person you should ask lab material related questions to.

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/

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.
Student's 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/

- ***Students are encouraged to contact their professor to discuss accommodation needs or any way in which they can help you succeed.***

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 https://secure.students.yorku.ca/pdf/religious-accommodation-agreement-final-examinations.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-andor-harassing-behaviour-in-academic-situations-senate-policy/

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