

Department of Biology Course Outline

BIOL4510: Cellular and Molecular Basis of Muscle Physiology
SC/BIOL 4510 3.00
Fall 2020

Course Description

Topics include muscle development, muscle-specific gene expression, molecular and electrophysiological basis of muscle contraction, biochemical plasticity of muscle, sarcolemmal and nuclear signal transduction in muscle, muscle regeneration and reprogramming, with a primary focus cardiac muscle. In addition, we will look at the impact of exercise on cardiac remodeling.

The course will be offered asynchronously through remote/online delivery, with synchronous sessions during the available three hour lecture period on Mondays and Wednesdays weekly (see below)..

Prerequisites (strictly enforced)

Prerequisite(s): AS/HH/SC/KINE 3012 3.00 **or** SC/BIOL 3060 4.00 and SC/BIOL 3070 4.00. Course credit exclusions: None.

WARNING: Students without pre-requisites will be de-enrolled unless they have advanced standing or permission from the Course Director

Course Instructors and Contact Information

Course Director: Robert Lakin
Email: lakinrob@yorku.ca
Office: 354 Farquharson Building
Office Hours: Online/remote, by appointment

For email correspondence, please put your name & student number & relevant description of the email (including course code) in the subject line.

Schedule

Synchronous and asynchronous

Synchronous Sessions: Monday and Wednesday: 1:00 – 2:30 pm

Links to each lecture will be provided as a Zoom link on Moodle

Technology Requirements

Lectures will be prerecorded (asynchronous), with the live (Synchronous) class time focused on student questions and expansion on material presented in the prerecorded lectures.

Synchronous sessions will be recorded for students unable to attend and made available within 48-hours on Moodle (see below for additional information about Zoom sessions).

Recommended (but not required); *high speed internet, audio capability (microphone), ability to stream online lectures, ability to support video conferencing software* (i.e., for synchronous sessions, office hours), *Proctortrack requirements* (see <https://registrar.yorku.ca/proctortrack-faq> and Moodle)

Evaluation

Midterm 1 – 20%

Midterm 2 – 20%

Final Exam – 30% (TBD)(Proctortrack may be used, see below)

Written Assignments – 15% (4 assignments, see due dates below)

Module Quizzes – 10% (bi-weekly throughout the term, best 5 out of 6 quizzes will be accepted)

Assignment – 5%

Please do not ask the Course Director how many questions will be on the test or exam. Your question will not be answered.

Midterms and Final Exam:

The format of the midterm tests and final exam will include short and long written answers. The midterms will be held during synchronous class sections and will be held through Moodle.

If you believe that a written answer on a test was marked incorrectly, you must submit your midterm for remarking within **one week** of the test being made available to you.

Note: Re-marking can result in the mark being raised, confirmed or lowered.

The final exam is non-cumulative, except for those students who missed any of the midterm tests (see "Course Policies" below). Note that the final exam may be proctored using Proctortrack (see below).

Moodle Quizzes:

Six timed quizzes will be posted bi-weekly consisting of multiple choice, fill-in-the-blanks, diagrams, and/or short-answer questions with the goal of gauging student learning throughout the course and to keep students on schedule. Only the best 5 out of 6 quizzes will be included in your final mark.

Assignment:

Students will be required to complete the equivalent of a take-home assignment to be completed over a couple days and submitted through Moodle.

Written Assignments

Students will be required to read research papers and submit written summaries of the papers.

Assignments are due before class and must be uploaded onto Moodle.

There is a 5% deduction/day for late assignments. There is a 10% deduction for going over the word limit.

In order to be fair and consistent with regards to the entire class, individual grades are not negotiable. There will be no "extra credit" assignments. Marks for assignments and tests will not be "rounded".

Students who miss a midterm test will have the weighting AND lecture material transferred to their final exam. Therefore, those students will write a longer final exam.

Final grades may be subject to grades distribution adjustment to conform to Program or Faculty grades distribution profile

Important Dates

Midterm 1 – Wednesday, October 7 (during class time)
Midterm 2 – Monday, November 9 (during class time)
Final Exam – date to be determined by Registrar's Office (December 9-23)

Drop Date: Friday November 6, 2020

NOTE: for additional important dates such as holidays, refer to the "See All Important Dates" at Current Students <http://www.yorku.ca/yorkweb/cs.htm>

Resources

Required textbook: None

All course materials (lecture notes/recordings, reading material) will be posted on Moodle.

Website: Moodle

Please check the BIOL 4510 Moodle website (www.yorku.ca/moodle) on a regular basis for course updates and postings. Course announcements from the Moodle site may be associated email; **please regularly check your email account.**

Moodle Discussion Boards

The Discussion Board will be an important component of the online learning environment of the course. All questions related to course/lecture materials will be posted (anonymously) on the Discussion Board, with the expectation that students in the course can have the opportunity to respond and discuss.

Be sure to read the other threads before you post a question to see if your question has already been answered.

When posting, be clear specific and professional (see Netiquette guidelines posted on Moodle).

Discussions are monitored. Messages containing personal attacks, inappropriate language, or other disrespectful contents will be removed. Irrelevant material will also be removed. Follow the York University Student Code of Conduct <http://www.yorku.ca/oscr/codeofrr.html>

If you notice any inappropriate threads please contact the Course Director.

Disclaimer: While Moodle moderators / instructors will attempt to remove (or edit) objectionable/inappropriate material as quickly as possible, it is not always possible to review every post. All posts made on the forums express the views and opinions of the author and not the moderators / instructors (except for posts by these people) and they cannot be held liable.

Learning Outcomes

Upon successful completion of BIOL4510, students will be able to demonstrate an understanding of the structure and function of the heart, and the fundamental cellular mechanisms regulating excitation-contraction coupling, cell signaling and embryonic development of the heart. Students will have an understanding of the mechanisms of myocardial regeneration and aging, as well as the impact of exercise on cardiac structure and function.

Specific learning outcomes:

- Explain major concepts, methodologies, and issues in muscle physiology, demonstrating detailed knowledge on specific course topics (i.e., course topics).
- Apply scientific knowledge and critical thinking to identify, define, and analyze issues in muscle physiology and design/suggest solutions.
- Given an experimental figure and associated experimental information, describe (in own words) what is represented and the significance of the experimental findings (in the context of the course).

- Use technology (i.e., Moodle forums) to share information and collaborate with the course instructor and other students in the course.
- Communicate (in writing) concepts in muscle physiology to a scientific and/or lay audience.
- Read, interpret, critically evaluate, and synthesize information (including experiments and data) about muscle physiology in peer-reviewed articles (i.e., writing assignments).
- Summarize key points from peer-reviewed articles to provide relevant information and support.

*additional learning outcomes will be posted with each lecture/assignment

| Course Content | |
|-------------------------|---|
| Date | Topic |
| September 9 | Course Introduction |
| September 14 | Cardiac Physiology |
| September 16 | Cell Biology |
| September 21 & 23 | Contractile Proteins |
| September 28 & 30 | Sarcoplasmic Reticulum |
| October 5 | Writing Assignment #1 – September 30th @5:00pm Ion Channels I + Midterm Review |
| October 7 | Midterm #1 (20%) Lectures: Cardiac Physiology to Sarcoplasmic Reticulum (September 9 th – September 30 th inclusive) |
| October 12-16 | <i>Fall Reading Week</i> |
| October 19 | Ion Channels II |
| October 21 | Pumps and Exchangers |
| October 26 | Writing Assignment #2 – October 23 @ 5:00pm Channelopathies |
| October 28 & November 2 | Excitation-Contraction Coupling |
| November 4 | Assignment (5%) – November 2nd Cell Signaling I |
| November 9 | Midterm #2 (20%) Lectures: Ion Channels to Excitation-Contraction Coupling (October 5 – November 2) |
| November 11 | Cell Signaling II |
| November 16 & 18 & 23 | Embryonic Heart Development |
| November 25 | Writing Assignment #3 – November 16 @ 5:00pm Exercise and Heart Function |

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| November 30 & December 2 | Stem Cells and Regenerative Medicine |
| December 7 | Exam Review and Questions Writing Assignment #4 – December 7 @ 5:00pm |
| Final Exam (30%) TBD | Lectures: Cell Signaling to Stem Cell and Regenerative Medicine The final exam is scheduled by the Registrar's Office December exam period: December 9-23 |

Experiential Education and E-Learning

e-learning: to get the most out of the course, students are expected to go through the prerecorded lectures/modules on their own time (asynchronous), with the class sessions (synchronous learning) focused on addressing topics that require further clarification or elaboration.

Experiential learning: students will have the opportunity to consider their audience when writing, with the goal of the writing assignments to adapt writing styles for a scientific or lay audience.

Other Information

Online Proctored Final Examination - Proctortrack

This course may require the use of online proctoring for examinations. The instructor may use an online proctoring service to deliver the exam(s), which would be administered through the Learning Management System (e.g. Moodle, Canvas, etc.). Students are required to have access to minimum technology requirements to complete examinations. If an online proctoring service is used, students will need to become familiar with it at least five days before exam(s). For technology requirements, Frequently Asked Questions (FAQs) and details about the online proctoring service visit – <https://registrar.yorku.ca/online-exams> or <https://registrar.yorku.ca/proctortrack-faq>. Students are required to share any IT accommodation needs with the instructor as soon as they are able.

Zoom

Several platforms will be used in this course (e.g., Moodle, Crowdmark, Zoom, etc.) through which students will interact with the course materials, the course director / TA, as well as with one another. Please review the syllabus to determine how the class meets (in whole or in part), and how office hours and presentations will be conducted.

Students shall note the following:

- Zoom is hosted on servers in the U.S. This includes recordings done through Zoom.
- If you have privacy concerns about your data, provide only your first name or a nickname when you join a session and choose to have your cameras off.
- Questions can be asked either via video or through the Chat function within Zoom.
- For synchronous sessions, the Zoom session will be recorded for students who are unable to make it or may be in a different time zone.
- The system is configured in a way that all participants are automatically notified when a session is being recorded. In other words, a session cannot be recorded without you knowing about it. Technology requirements and FAQs for Moodle can be found here - <http://www.yorku.ca/moodle/students/faq/index.html>

Student Responsibilities

- 1) Students are responsible for material presented in class (synchronous and asynchronous sessions) and assigned papers.
- 2) Lecture and Zoom recordings can be shared **only** with students enrolled in the course. Recordings **cannot** be uploaded to public websites or otherwise shared publicly. Students in violation of these policies may have legal action taken against them.
- 3) A final will be given in a 3-hour block during the December exam period and will have the similar types of questions as the midterm tests.

It is your responsibility as a student to ensure that you are available to sit for midterms (during the pre-determined lecture time) and examinations during the entire exam period. Under no circumstances will makeup midterm test or final exam be provided because of conflict with vacation plans or work conflicts.

4) It is your responsibility to earn your grade. Individual adjustment of a student's grade without academic merit is unethical. All requests for grade "bumping" will be ignored.

Course Policies

Course Policies on Missed Tests and Exams

1. If you miss a test, you must provide the Course Director with written documentation (e.g. Attending Physician's Statement, accident report, death certificate) to support your absence.

Only a York "Attending Physician's Statement Form" will be accepted:

<http://registrar.yorku.ca/pdf/attending-physicians-statement.pdf>

The documentation should cover the date of the missed test. All documentation supporting your absence for missing a test must be received by the Course Director or by the Biology Undergraduate Office **within a week of the missed test** (or as soon as the student is able to return to school if you are sick for more than a week). **Students must contact the Course Director within 48 hours after a missed test to inform him of their absence. If appropriate documentation is NOT provided within ONE week, a mark of zero will be earned on the missed test.**

2. Missed Midterm Exemption Form

In addition to the appropriate document(s) to support the student's absence from a midterm test, students must also complete and sign the Missed Midterm Exemption Form. The form is posted on Moodle.

3. **Students who do not write the final exam, AND have completed all midterms and assignments, must contact the Course Director for permission to write a deferred exam and provide a Deferred Standing Agreement form:**

http://registrar.yorku.ca/sites/registrar/files/pdf/deferred_standing_agreement.pdf.

It is Senate Policy that "*Normal requests for deferred standing must be communicated within one week following a missed examination, or on the last day to submit course work*".

Please check out the Registrar's Office Deferred Standing FAQs more details:

<http://www.registrar.yorku.ca/exams/deferred/>

Students who do not write the final exam, AND have missed at least one midterm or have not completed any of assignments, must submit a petition form to write a deferred exam. For more information, please go to:

<http://myacademicrecord.students.yorku.ca/academic-petitions>

If the Course Director denies the deferred standing request, the student can submit a petition to their home Faculty through the Office of the Registrar. An academic committee will decide whether or not permission to write the deferred final exam will be granted based on the situation and evidence presented. Denied petitions will result in a zero on the final exam.

See <http://registrar.yorku.ca/petitions/academic> for information regarding academic petitions.

NOTE: There will be **NO** make-up day for the midterms. If you cannot attend the midterm **AND** you have valid reasons for missing the test(s), the **weighting of the test and course material will be put on the final exam.**

Scheduling Conflicts: Assignment and midterm dates are not negotiable. They have been structured to distribute your workload over the term and have been based on feedback from previous BIOL 4510 students. Scheduling conflicts (for valid reasons) for the midterms must be brought to my attention **at least two weeks prior to the midterm** so that alternative arrangements can be made.

Remarking of Assignments/Midterm: Any marked term work (including tests/quizzes) may be submitted for re-grading within 5 business days of the work being returned (made available) to the student. Remarking is only possible for *assignments/tests written in ink*; those written in pencil **will not** be remarked. The work must be accompanied by a written rationale providing valid reasons for the request for reappraisal; requests because

'I need a higher mark' will be denied. **Note: remarking can result in the mark being raised, confirmed, or lowered.**

Discussion of Marks/Grades: To be fair and consistent, individual grades are not negotiable, particularly as there are opportunities to recoup marks. Contact me about marks ONLY if there's a clear error in your mark (calculation, etc.) as soon as possible. **There are no alternative assignments that can be completed for students to increase marks (e.g., extra credit).**

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 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.

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/>

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/>