

Medical Biophysics 4970E – Research Project in Medical Biophysics

1. Course Information

Medical Biophysics 4970E: Research Project in Medical Biophysics

Academic year: 2018-2019

Major laboratory course in experimental biophysics for students registered in an Honors Specialization Medical Biophysics (Medical Science or Physical Science Concentration). The main components are a major experimental project (topic and advisor chosen in consultation with the student) and scientific communication (student presentation and reports).

Lectures/Tutorials:

Monday and Wednesday 12:30-13:30 in MSB-193AB unless otherwise stated

Laboratories:

Monday 9:30-12:30, room TBA (section 002)

Friday 14:30-17:30, room TBA (section 003)

**depending on student availability, laboratories may only run during one section or be conducted independently*

Antirequisite(s):

Medical Biophysics 4971E.

Prerequisite(s):

Medical Biophysics 3970Z and registration in Year 4 of one of the following Honors Specialization modules: Medical Biophysics (Medical Science Concentration), Medical Biophysics (Physical Science Concentration), or Medical Biophysics (Biological Science Concentration).

Extra Information:

Students are expected to spend a minimum of 15h per week (including class time) on MEDBIO 4970 related course assignments, labs, and the research project.

Senate regulation regarding the student's responsibility regarding requisites:

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

2. Instructor Information

Instructors	Email	Office	Phone	Office Hours
Dr. Jeffrey Carson (Course Coordinator)	jcarson@lawsonimaging.ca	Lawson/SJHC E4-142	x64767	Email for appointment
Lawrence Yip (Course Instructor/TA)	lyip4@uwo.ca	Lawson/SJHC E4-143	x64682	Email for appointment
Mr. Dan Sich	dsich2@uwo.ca	Taylor	x81419	Email for appointment

Course Website:

Workshop information, course information, and assignments will be found on OWL. Students with OWL issues should visit: <https://owl.uwo.ca/portal/site/owldocs>

3. Course Content

Required Activities:

There are four main components to this course:

1. An individual research component in the laboratory of a faculty member.
2. Regularly scheduled in class lectures/workshops.
3. Attendance at departmental seminars (Mondays at 8:30am, recommended).
4. Completion of additional laboratories and assignments.

Course Structure:

Research Project

Students will be responsible for finding a research project and supervisor. Supervisors must have a faculty appointment in the Department of Medical Biophysics. Preference should be given to professors who have submitted projects that appear on the resources/projects page.

In the event that the student has arranged to work with a specific supervisor who has not submitted a project description, then the student and supervisor must provide a project description for upload to the project page within 1 week of the first class. Please send the project description to the course coordinator by email.

As part of their research project, each student is required to complete a number of assignments and presentations related to their research. These include:

- Research Proposal
- Abstract formatted to Ontario Graduate Scholarship (OGS) guidelines
- 2x Quick Pitches with accompanying poster
- 2x Mini Seminar
- Seminar
- Draft Report
- Final Report
- Final Poster for A.C. Burton Day
- Oral Examination

Classes

This portion of the course will emphasize critical analysis and communication in science. Students will meet throughout the year at assigned times for instruction and practice in these aspects of scientific research.

Laboratory

The laboratory consists of experiments to be conducted in small groups or individually. The emphasis of the laboratory will be to provide an understanding of measurement systems, their application to experimental biophysics, and how to present the results in writing. This will involve signal classification, data collection and analysis, and the application of appropriate statistical techniques. A complete lab manual containing the relevant theory and materials can be downloaded from the course website. A completed pre-lab report is required for each laboratory and due at the start of the pre-lab demonstration. A written lab report is required, as well as a reflection following the second laboratory. The due dates for the reports can be found on the schedule page. It is the responsibility of the student to complete the data collection, the lab report and the pre-lab report before the set deadlines.

Assignments

Assignments consist of exercises relating to literature search techniques and organization of references. Other assignments relating to the lab or research components are described in those sections of this document. Assignments have similar submission rules to the laboratory and due dates are available on the schedule page.

4. Learning Objectives

1. Knowledge

Students will be able to explain the motivation, objectives, methods, results, and discuss the meaning of the results related to a research topic. Students will be able to analyze and solve problems, and identify new opportunities for research.

2. Literacies and Interdisciplinarity

Students will be able to understand and use technical language, theory, numerical methods, and research methods. They will be able to explore a complex research question from a variety of perspectives, recognizing bias, and identifying missing knowledge. Students will be able to use knowledge to answer research questions. They will be able to describe limitations of the sources and methods they use.

3. Communication

Students will be able to interact and collaborate effectively on research topics. Students will be able to present research work clearly and accessible to a variety of audiences. Students will be able to communicate research work through written and oral means.

4. Resilience and Life-long Learning

Students will be able to adapt to research challenges by being self-aware, resilient, and self-reflective. In addition to their mastery of discipline specific knowledge and methods, students will be able to articulate a clear understanding of their own interests and goals as well as the limitations of their own knowledge.

5. Global and Community Engagement

Students will be able to interact ethically, compassionately, and thoughtfully with peers and researchers.

6. Critical Inquiry and Creative Thinking

Students will have developed habits of constructive skepticism, differentiation and intellectual adaptability in their approaches to research. They will be able to identify underlying assumptions and evidence thereby arriving at conclusions about reliability. They will bring habits of careful judgment, an appetite for further refinement, and highly developed problem-solving skills to research problems.

7. Professionalism and Ethical Conduct

Students will be able to recognize the ways in which their conduct affects others in their field of research. They will be able to work effectively with others practically (e.g. time management, conflict resolution); ethically (e.g. division of intellectual responsibility and credit) and socially (e.g. respecting cultural differences, work preferences).

5. Course Materials

There is no single text that encompasses the material in the course. Students should have a laboratory notebook. This may be provided by the research lab or alternatively must be purchased for all record keeping in the lab.

6. Evaluation

The final grade will be based on the laboratory component (8%), the assignments (5%), and the research project (87%). There is no written test or written final exam. An oral exam will be scheduled near the end of the second term.

Final grade breakdown:

Laboratory

Lab #1 – 3%

Lab #2 – 3%

Reflection – 2%

Assignments

Library Resources – 5%

Research Project

Project Plan/Research Proposal – 3%

OGS Abstract – 3%

Quick Pitch I – 1%

Quick Pitch II – 3%

Mini Seminar I – 1%

Mini Seminar II – 5%

Seminar - 10%

Draft Report – 5%

Final Report – 20%

Final Poster for presentation at A.C. Burton Day – 3%

Oral Examination – 10%

Lab Performance (term 1) – 7%

Lab Performance (term 2) – 8%

Attendance & Participation – 5%

***The department reserves the right to make adjustment to the grading scheme if deemed necessary*

All written work, including the final scientific paper (thesis), must be submitted electronically through OWL. Hard copies of the paper will not be required.

Student participation in the oral presentation sessions is expected. Attendance at all activities (including workshops) is required. If you are unable to attend a session, the usual University requirements for absence apply (see Section 7) and you should inform both the course coordinator and instructor as soon as possible.

Handing in work late and academic misconduct

- Late reports, presentations, and assignments will receive a penalty of 20% for each 24h period or fraction thereof after the due date (e.g. reports submitted a few minutes after the deadline will be penalized 20%). Penalties can only be avoided with official academic accommodation.
- In the event a student has been involved in academic misconduct (e.g. plagiarism) with respect to a report, presentation or assignment, the student will receive a grade of zero for the report, presentation or assignment and be subject to UWO penalties for academic misconduct (see below).
- After receiving a mark on an assignment, students will have 2 weeks to send any concerns in writing to the course instructor. After this time, re-evaluations will be denied.
- Students will receive at least 15% of their final grade by November 9, 2018.
- As per policy for the BMSc program in the Schulich School of Medicine and Dentistry, we will report the grade you earned in the course. Grades will not be “bumped.” In accordance with the Academic Handbook, final grade averages will be calculated to two decimal places and rounded to the nearest whole number with .45 rounded up.

7. Additional Information/Statements

Statement on Academic Offenses

“Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following website: http://www.uwo.ca/univserc/handbook/appeals/scholastic_discipline_undergrad.pdf.”

“All written work will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).”

Absence from course commitments

Students are expected to attend/complete all workshops, seminars, and assignments. All assignments must be submitted on time. Should a student require accommodations, the following policy applies.

Absence for medical illness:

Statement from the Academic Counselling Office, Faculty of Science

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Academic Counselling Office as soon as possible and contact your instructor (s) immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved by the Academic Counselling Office and the instructor has been informed. For further information please see: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf

A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found at: <https://studentservices.uwo.ca/secure/index.cfm>

Absence for non-medical reasons:

If you are unable to meet a course requirement due to non-medical reasons, then please contact the instructor and the course coordinator. Accommodation will only be granted in cases where there are extraordinary circumstances.

Correspondence

Email is the preferred method of correspondence. All emails must include 'MEDBIO 4970' in the subject line. In emails related to the Research Project, the supervisor(s) and the mentor(s) must be cc'd to the email.

Interaction with supervisor and mentor

Students will meet with their supervisor or mentor at least once every 2 weeks, preferably every week. During each meeting, the supervisor/mentor must be informed of the student's progress on the research project. The lab notebook must be presented to the supervisor/mentor for appropriate signatures. The Course Coordinator may request to see the laboratory notebook at any time. If the supervisor holds regular lab meetings, then the student must attend. Supervisors will evaluate their student at the end of each term on whether they have met course and lab expectations.

Support Services:

Office of the Registrar: <http://www.registrar.uwo.ca>

Academic Counselling: http://www.uwo.ca/sci/undergrad/academic_counselling/

Accessibility: http://accessibility.uwo.ca/resources/support_services.html

Student Center: <http://student.uwo.ca>

Student Development Centre: <http://www.sdc.uwo.ca>

Student Health Services: <http://www.shs.uwo.ca/>

Students that are in emotional/mental distress should refer to Mental Health@Western <http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.