Medical Biophysics 4971E – Research Project in Medical Biophysics

Course Information

Academic year: 2019-2020

Major laboratory and tutorial course in experimental biophysics for students registered in an Honors Specialization Medical Biophysics (Clinical Physics Concentration). The main components are a major experimental project related to Clinical Physics (topic and advisor chosen in consultation with the student) and scientific communication (student presentations and reports). Students will work on a research project from September to March and present their results as a research paper (thesis) and public seminar.

Lectures/Workshops:

Fall & Winter terms: Monday 9:30-11:30 in MSB-394 unless otherwise stated
Winter term only: Wednesday 10:30-13:30 in MSB-282 unless otherwise stated

Antirequisite(s):

Medical Biophysics 4970E.

Prerequisite(s):

Medical Biophysics 3970Z and registration in Year 4 of the Honors Specialization module: Medical Biophysics (Clinical Physics Concentration).

Extra Information:

Students are expected to spend a minimum of 15 hours per week in the laboratory.

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 if 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 (519) 661-2111 x 82147 for any specific question regarding an accommodation.

2. Instructor Information

<table>
<thead>
<tr>
<th>Instructors</th>
<th>Email</th>
<th>Office</th>
<th>Phone</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Jeffrey Carson (Course Coordinator)</td>
<td><a href="mailto:jcarson@lawsonimaging.ca">jcarson@lawsonimaging.ca</a></td>
<td>SJHC E4-142</td>
<td>x64767</td>
<td>Email for appointment</td>
</tr>
<tr>
<td>Lawrence Yip (Course Instructor/Teaching Assistant)</td>
<td><a href="mailto:lyip4@uwo.ca">lyip4@uwo.ca</a></td>
<td>SJHC E4-146</td>
<td>x64682</td>
<td>Email for appointment</td>
</tr>
<tr>
<td>TBA (Teaching Assistant)</td>
<td>TBA</td>
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<td>TBA</td>
<td>Email for appointment</td>
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<td>TBA (Library Staff)</td>
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Course Website:

Workshop information, course information, and assignments will be found on OWL. Students with OWL issues should visit: https://owlhelp.uwo.ca/students/tools/index.html

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 9:00am, recommended).
4. Completion of additional 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.
Projects must be clinical in nature. Examples include analysis of patient derived data, research on methods and instrumentation that are used for patient care, and clinical trials. A clear link must be established between the outcome of the research project and an impact on patient care. Projects involving wet-lab work with cultured cells, experiments on animals, and biophysical modeling are generally not permitted.

In the event that a 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 approval within 1 week of the first class/other specified deadline. Please send the project description to the Course Coordinator by email, and cc’ the Course Instructor and Teaching Assistant(s).

As part of their research project, each student is required to complete assignments and presentations related to their research.

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. The following activities (in no particular order) will take place during scheduled class-time:

1. Introduction to course syllabus
2. Instruction on using library resources and performing a literature search
3. Instruction on how to complete a laboratory notebook.
4. Presentation on Graduate Studies, followed by Q&A.
5. Instruction on how to write scientifically for a general audience
6. Instruction on how to write scientifically in journal manuscript format (“thesis”).
8. Instruction on how to present seminar-length presentations (7-12 minute duration),
9. Instruction on how to prepare and present a scientific poster.
10. Instruction on how to prepare an abstract for a research manuscript.
11. Presentation of Quick Pitch 1, 2
12. Presentation of Mini Seminar
13. Presentation of Final Seminar

Assignments

Assignments consist of exercises relating to literature search techniques and organization of references.
4. Learning Outcomes

Following completion of this course, successful students will be able to:

1. Compile a literature review based on primary literature and develop a rationale and motivation for the research project. Work independently or collaboratively on a research project and at its conclusion, explain the methods, results, and discuss the meaning of the research project in relation to existing peer-reviewed literature through the writing of a scientific report in journal manuscript format (“the thesis”).

2. Demonstrate independent technical expertise for lab procedures (general or field-specific) and record study/experimental details in a clear, rigorous, and repeatable manner.

3. Present research work clearly and accessibly to a variety of audiences, through short pitches, seminar-length oral presentations, and as a scientific poster.

5. Course Materials

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

6. Evaluation

A summary of each evaluation is detailed below. In brief, students will be evaluated by their supervisor on their performance in the laboratory. This will include not only technical skills, but also their familiarity with the scientific literature and their contribution to the experimental design, analysis, and interpretation of the data. This evaluation will be done at two times during the academic year. The first evaluation will be done at the end of the first term and is designed to inform the student on his/her progress to date. The second evaluation will be done at the end of the second term. We will provide you with the marking sheet so that you may see the evaluation criteria.

For written work, all assignments will be evaluated by the course teaching assistant(s). The scientific paper (“thesis”) will be evaluated by both teaching assistants and the course coordinator (see table below for details). Peer evaluations may be utilized for earlier draft versions of the paper submitted throughout the year, to help you improve your writing. Supervisors will not assist you in writing your thesis. Students will be evaluated on their written assignments and oral presentations throughout the year by the course coordinator, teaching assistants, and potentially other faculty involved. Feedback will be given to students as soon as possible after presentations.

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. Failure to attend classes and workshops will result in a reduction in the participation and attendance mark.

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.

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<tr>
<th>Activity</th>
<th>Weight</th>
<th>Evaluator(s)</th>
<th>Deadline</th>
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<tr>
<td>Annotated Bibliography</td>
<td>1%</td>
<td>Teaching assistant(s)</td>
<td>Oct 4th noon</td>
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<tr>
<td>Written Research Proposal/Project Plan</td>
<td>4%</td>
<td>Teaching assistant(s)</td>
<td>Oct 11th noon</td>
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<td>Library Resources Assignment</td>
<td>5%</td>
<td>Teaching assistant(s) and Library staff</td>
<td>Oct 25th noon</td>
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<tr>
<td>Quick Pitch 1</td>
<td>2%</td>
<td>Teaching assistant(s)</td>
<td>Nov 25th</td>
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<tr>
<td>Quick Pitch 2</td>
<td>5%</td>
<td>Teaching assistant(s)</td>
<td>Jan 13th</td>
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<tr>
<td>Thesis Draft 1</td>
<td>2.5%</td>
<td>2 Peer reviewers</td>
<td>Jan 17th noon</td>
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<tr>
<td>Abstract</td>
<td>4%</td>
<td>Teaching assistant(s)</td>
<td>Feb 14th noon</td>
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<tr>
<td>Mini Seminar</td>
<td>6%</td>
<td>Teaching assistant(s) and Course Coordinator</td>
<td>Week of Feb 24th</td>
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<tr>
<td>Thesis Draft 2</td>
<td>2.5%</td>
<td>2 Peer reviewers</td>
<td>Mar 6th noon</td>
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<tr>
<td>Research Paper (Thesis)</td>
<td>25%</td>
<td>Teaching assistant(s) and Course Coordinator</td>
<td>Mar 25th noon</td>
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<tr>
<td>Data Submission to Lab Supervisor</td>
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<td>Apr 1st noon</td>
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<td>Final Seminar to Department</td>
<td>10%</td>
<td>Teaching assistant(s), Course Coordinator, faculty</td>
<td>Week of Mar 30th</td>
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<td>Poster (Undergraduate Research Day/AC Burton Day)</td>
<td>3%</td>
<td>Teaching assistant(s)</td>
<td>TBA</td>
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<tr>
<td>Oral Examination</td>
<td>10%</td>
<td>Teaching assistant(s) and Course Coordinator</td>
<td>Apr 6th</td>
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<tr>
<td>Lab Performance (Term 1)</td>
<td>7%</td>
<td>Supervisor</td>
<td>N/A</td>
</tr>
<tr>
<td>Lab Performance (Term 2)</td>
<td>8%</td>
<td>Supervisor</td>
<td>N/A</td>
</tr>
<tr>
<td>Attendance &amp; Participation</td>
<td>5%</td>
<td>Teaching assistant(s)</td>
<td>N/A</td>
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**The department and course coordinator/instructor reserve the right to make adjustment to the grading scheme and scheduled deadlines if deemed necessary**

**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 addition, following instructions properly on each assignment submission is very important. This includes submitting assignments in the correct location, formatting the assignment correctly, as well as other details which will be clearly outlined for you for each assignment. A deduction of 10% from the assignment will be applied for not adhering to instructions.

- 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).

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:

[https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/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.

Appeals Policy

The Department of Medical Biophysics follows the Western University student academic appeals policy (http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#SubHeading_181). All appeals to individual graded course components must be submitted to the course instructor within 3 weeks of the grade being released. All final course grade appeals must be received by June 30. You must first appeal to the course instructor/coordinator. If this appeal is rejected, then you can appeal to the Undergraduate Chair of the Department of Medical Biophysics (Dan Goldman; dgoldma2@uwo.ca). If this appeal is rejected, you may then appeal to the Assistant Dean of the Bachelor of Medical Sciences Undergraduate Education Committee (Candace Gibson; Candace.Gibson@schulich.uwo.ca).

You must have suitable grounds for appeal which may include: 1) appeal on medical or compassionate grounds; 2) appeal based on extenuating circumstances beyond your control; 3) appeal based on bias, inaccuracy or unfairness. All appeals must be accompanied by a detailed explanation along with supporting documentation. You should submit your appeal as an e-mail with a single attachment. If you have multiple supporting documents, you should merge them into a single document.

Correspondence

Email is the preferred method of correspondence. All emails must include 'MEDBIO 4971E' 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 and/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 and instructor 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: https://www.uwo.ca/sci/counselling/advising_services/appointments.html
Accessibility: https://accessibility.uwo.ca/students/support_services.html
Student Center: http://student.uwo.ca
Student Development Centre: http://www.sdc.uwo.ca
Student Health Services: https://www.uwo.ca/health/shs/index.html
Students that are in emotional/mental distress should refer to https://www.uwo.ca/health/psych/index.html for a complete list of options on how to obtain help.