1. Course Information (Jan 4th/2021)

Medical Biophysics 3970Z:
General Biophysics Laboratory
Full-year half course 2021-2022 (55th anniversary of undergraduate Biophysics)

Intended primarily for students in Honors Specialization and Major modules in Medical Biophysics. Lectures will include introduction to scientific writing/reading, communication, and basic statistics. Laboratories include topics from biomechanics (mechanical properties of arteries), imaging (image processing/analysis), and biophysical analysis (washout models). Includes an individual 12-week project in a research laboratory.

**Extra Information:** 3 laboratory hours (3 laboratory hours every other week and up to 3 tutorial hours, at the instructor's discretion, in alternate weeks). 0.5 credit course spanning both the Fall and Winter terms.

**Laboratory/Tutorial:**
Monday – two sections - 10:30-1:30 and 2:30-5:30 MSB190

Although 3 hours are available for data collection and interaction with the instructors, it is expected that some labs and most tutorials and demonstrations will be completed in less time.

**Antirequisite(s):** The former Medical Biophysics 3302E.

**Pre-or Corequisite(s):** Medical Biophysics 3330F/G; Medical Biophysics 3501F; Medical Biophysics 3505F.

**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

<table>
<thead>
<tr>
<th>Instructors</th>
<th>Email</th>
<th>Office</th>
<th>Phone</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Ronald (JR)</td>
<td>(via OWL)/jronald@robarts.ca</td>
<td>Robarts 2241A</td>
<td>24391</td>
<td>TBA</td>
</tr>
<tr>
<td>Shirley Liu (SL)</td>
<td><a href="mailto:sliu826@uwo.ca">sliu826@uwo.ca</a></td>
<td>TBA</td>
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<tr>
<td>Simran Sethi (SS)</td>
<td><a href="mailto:ssethi25@uwo.ca">ssethi25@uwo.ca</a></td>
<td>TBA</td>
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**OWL:** Students with OWL issues should see: https://owl.uwo.ca/portal/site/owldocs
3. Course Syllabus

This course replaces the laboratory component of the former Medical Biophysics 3302E

COURSE OBJECTIVES

(i) To complement the lecture material presented in MBP 3501F (Transport Systems), MBP 3505F (Mathematical Transforms) and MBP3330F (Biomechanics)

(ii) To provide hands on experience using a biophysics approach to research.

(iii) To prepare students for the Medical Biophysics 4th year research projects (MBP 4970E, 4971E)

APPROACH

Set laboratory exercises: Two set exercises will be performed by small groups of students where raw data is collected for further analysis. Some labs will require the full 3 hours while others may be completed in less time. Some labs use a low-tech approach to understanding universal concepts rather than high-tech equipment which may not be useful in a few years. Preliminary analysis will be discussed in a group session a week or two following the lab and reports (common data, individual analysis and discussion) are submitted the following week.

Virtual Research Lab Tours: Faculty and graduate students will give presentations about their research labs via Zoom. This provides an opportunity for students to obtain an overview of research in the department, make contacts and plan for their 12-week project.

12-Week Projects: During the latter part of the year, students work in biophysics research labs on individual projects for 12 weeks. This provides them with an opportunity to experience the research environment, contribute to ongoing projects, give scientific presentations/reports, defend their work, and plan for their 4th year project.

Expected Learning Outcomes - Upon completion of the course, students should be able to:

1. Develop hypotheses and design experiments to test hypotheses, develop problem-solving skills, and learn to effectively communicate results for a variety of medical biophysics research topics (Critical Inquiry and Creative Thinking, Communication, Knowledge).

2. Use mathematical and physical models to analyse data (Knowledge).

3. Use basic statistical analysis to test for significance in differences found in lab results (Knowledge).

4. Work in a research environment by interacting with research colleagues and providing individual input to the overall project (Professionalism and Ethical Conduct; Literacies and Interdisciplinarity)

5. Report the results of scientific studies using a variety of modern written and oral presentation styles (Communication)
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>1</td>
<td>Sept 6</td>
<td>No Class</td>
<td>N/A</td>
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<tr>
<td>2</td>
<td>Sept 13</td>
<td>Course Introduction</td>
<td>JR/SL/SS</td>
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<td>3</td>
<td>Sept 20</td>
<td>Scientific Abstracts &amp; Basic Statistics Lecture</td>
<td>JR/SL/SS</td>
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<td>4</td>
<td>Sept 27</td>
<td>Lab 1 – Respiratory System</td>
<td>JR/SL/SS</td>
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<tr>
<td>5</td>
<td>Oct 4</td>
<td>Virtual Research Lab Tours (Main Campus)</td>
<td>SL/SS</td>
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<tr>
<td>6</td>
<td>Oct 11</td>
<td>No Class - Thanksgiving</td>
<td>N/A</td>
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<tr>
<td>7</td>
<td>Oct 18</td>
<td>Virtual Research Lab Tours (Off Campus)</td>
<td>SL/SS</td>
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<tr>
<td>8</td>
<td>Oct 25</td>
<td>Journal Club – 2 assigned papers should be read and critiqued prior to class (5% participation mark)</td>
<td>JR/SL/SS</td>
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<tr>
<td>9</td>
<td>Nov 1</td>
<td>Reading Week</td>
<td>N/A</td>
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<td>10</td>
<td>Nov 8</td>
<td>Lab 2 – Cardiovascular System ePoster Template</td>
<td>SL/SS</td>
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<td></td>
<td>Students choice of research project supervisor due</td>
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<tr>
<td>11</td>
<td>Nov 15</td>
<td>Scientific Presentations Lecture Questions about ePoster to be asked</td>
<td>JR/SL/SS</td>
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<tr>
<td>12</td>
<td>Nov 22</td>
<td>Research Projects – Week 1</td>
<td>Supervisors</td>
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<td>Lab 2 ePoster Due (15%)</td>
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<tr>
<td>13</td>
<td>Nov 29</td>
<td>Research Projects – Week 2</td>
<td>Supervisors</td>
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<td>14</td>
<td>Dec 6</td>
<td>Research Projects – Week 3</td>
<td>Supervisors</td>
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<td>Research Lab Presentations (10%)</td>
<td>JR/SL/SS</td>
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<tr>
<td>15</td>
<td>Jan 10</td>
<td>Research Projects – Week 4</td>
<td>Supervisors</td>
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<tr>
<td>16</td>
<td>Jan 17</td>
<td>Research Projects – Week 5</td>
<td>Supervisors</td>
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<tr>
<td>17</td>
<td>Jan 24</td>
<td>Research Projects – Week 6</td>
<td>Supervisors</td>
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<td>3-minute Project Pitch Drop-In</td>
<td>SL/SS</td>
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<td>18</td>
<td>Jan 31</td>
<td>Research Projects – Week 7</td>
<td>Supervisors</td>
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<td>3-minute Project Pitch (5%)</td>
<td>JR/SL/SS</td>
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<td>19</td>
<td>Feb 7</td>
<td>Research Projects – Week 8</td>
<td>Supervisors</td>
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<tr>
<td>20</td>
<td>Feb 14</td>
<td>Research Projects – Week 9</td>
<td>Supervisors</td>
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<tr>
<td>21</td>
<td>Feb 21</td>
<td>Reading Week</td>
<td>N/A</td>
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<tr>
<td>22</td>
<td>Feb 28</td>
<td>Research Projects – Week 10</td>
<td>Supervisors</td>
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<td></td>
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<td>Scientific Writing Lecture</td>
<td>JR/SL/SS</td>
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<tr>
<td>23</td>
<td>Mar 7</td>
<td>Research Projects – Week 11</td>
<td>Supervisors</td>
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<td>Project Final Report Drop-In</td>
<td>JR/SL/SS</td>
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<td>24</td>
<td>Mar 14</td>
<td>Research Projects – Week 12</td>
<td>Supervisors</td>
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<td>Supervisor Evaluations Due (10%)</td>
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<tr>
<td>25</td>
<td>Mar 21</td>
<td>Research Project Reports Due (15%)</td>
<td>Supervisors</td>
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<tr>
<td>26</td>
<td>Mar 28</td>
<td>Project Presentations Drop-In</td>
<td>JR/SL/SS</td>
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<tr>
<td>27</td>
<td>Apr 4</td>
<td>Project Presentations (15%)</td>
<td>JR/SL/SS</td>
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<tr>
<td>28</td>
<td>Apr 11</td>
<td>Project Defenses (10%)</td>
<td>JR/SL/SS</td>
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4. Course Materials:
There is no formal text for the course. Instructional material will be provided electronically (primarily via OWL) and students may be directed to on-line references.

Textbook: None required
Supplemental Information: Provided via OWL
Laboratory Manual: Provided via OWL
Laboratory Materials: Provided
Safety Materials: As required for specific labs
Electronic Devices: Laptops or equivalent are useful for calculations and records

5. Evaluation:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weighting (%)</th>
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<tbody>
<tr>
<td>Lab 1 Abstract</td>
<td>15</td>
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<tr>
<td>Journal Club</td>
<td>5</td>
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<tr>
<td>Lab 2 ePoster</td>
<td>15</td>
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<tr>
<td>Research Lab Presentations</td>
<td>10</td>
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<tr>
<td>3-Minute Project Pitch</td>
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<tr>
<td>Supervisor Evaluations</td>
<td>10</td>
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<tr>
<td>Project Report</td>
<td>15</td>
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<tr>
<td>Project Presentation</td>
<td>15</td>
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<tr>
<td>Project Defense</td>
<td>10</td>
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There are no exams for the course

6. Additional Information/Statements

Statement on Academic Offences
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/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

Offenses include

Plagiarism, which may be defined as “The act or an instance of copying or stealing another’s words or ideas and attributing them as one’s own.” Excerpted from Black’s Law Dictionary, West Group, 1999, 7th ed., p. 1170. This concept applies with equal force to all assignments, including laboratory reports, diagrams, and computer projects. Students wishing more detailed information should consult their instructor, Department Chair, or Dean’s Office. In addition, they may seek guidance from a variety of current style manuals available in the University’s libraries. Information about these resources can be found at www.lib.uwo.ca/services/styleguides.html.

In this course, there are a number of written reports required for evaluation. We feel strongly that students should work together, sharing raw data and ideas. Reports submitted for marking, however, must be written independently. After working together, take the data, go away, do the analysis and write it up without looking at anyone else’s work. In a course as small as this, it’s easy for us to spot material with a common source.
Absence from course commitments

A. Absence for medical illness:
Students must familiarize themselves with the Policy on Accommodation for Medical Illness for Undergraduate Students, located at: [http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf)
The policy is also accessible from the Medical Accommodation

B. Absence for non-medical reasons:
Material submitted for evaluation (assignments, lab reports) after the due date will be subjected to a late penalty of 10%/day but will not be accepted after marked material has been returned to the class. Missed material will be given 0% unless accommodation is made through the Office of the Dean of Science.

C. Special Examinations
There is no final exam for this course, but students are expected to present their projects as a PowerPoint presentation at a scheduled time. Under exceptional circumstances, students may seek permission to make alternate arrangements.

Support Services:
Registrarial Services: [http://www.registrar.uwo.ca](http://www.registrar.uwo.ca)

Academic Counselling (Science and Basic Medical Sciences): [http://www.uwo.ca/sci/undergrad/academic_counselling/index.html](http://www.uwo.ca/sci/undergrad/academic_counselling/index.html)

USC Student Support Services: [http://westernusc.ca/services/](http://westernusc.ca/services/)

Student Development Centre: [http://www.sdc.uwo.ca](http://www.sdc.uwo.ca)

Student Health Services: [http://www.shs.uwo.ca](http://www.shs.uwo.ca)

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