

**Western University**  
**Faculty of Engineering**  
*School of Biomedical Engineering*

## BME 4400 - “Biomedical Engineering Research Project”

### COURSE OUTLINE – 2022-23

**CALENDAR DESCRIPTION:** Selection and investigation of a biomedical engineering research topic independently under the supervision of a faculty member. The student will carry out analytical and/or experimental work and prepare a project proposal including a literature review, and a written thesis. Each student must deliver a public lecture.

**COURSE INFORMATION:** Course  
 Coordinator: Prof. Louis Ferreira  
 Office: TEB 359  
 E-mail: louis.ferreira@uwo.ca  
 Lectures: Time and location TBD

**PREREQUISITE:** Registration in the final year of a Biomedical Engineering program.

**ANTIREQUISITES:** CBE 4415, CBE 4425, MME 4410.

**ACCREDITATION UNITS:** Engineering Science 75%, Complementary Studies 25%

**COURSE OBJECTIVES:** By the end of the course, students will be able to:

1. Define and devise an approach to solve a biomedical engineering research problem including, as appropriate, consideration of the needs of patient, healthcare provider, and/or scientific end users.
2. Complete and write a literature review about a biomedical engineering research topic.
3. Plan, execute, and interpret the results of an analytical, computational, and/or experimental investigation of a research topic including demonstrating appropriate applications of statistical analysis.
4. Professionally communicate the objectives and outcomes of a research project in oral and written form.
5. Identify and analyze regulatory and biomedical ethics constraints as they apply to the student’s research topic.

**GENERAL LEARNING OBJECTIVES (CEAB Graduate Attributes):**

Knowledge Base	✓	Use of Engineering Tools	✓	Impact on Society and the Environment	✓
Problem Analysis	✓	Individual and Team Work		Ethics and Equity	
Investigation	✓	Communication Skills	✓	Economics and Project Management	✓
Design		Professionalism		Life-Long Learning	✓

**CONTACT HOURS:** 10 laboratory hours per week, 1.5 course.

**TEXT:** N/A

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<b><i>EVALUATION:</i></b>	The final grade is computed as follows:		
	<b>Proposal</b>	<b>Oct. 4</b>	<b>5%</b>
	<b>Progress Report</b>	<b>Jan. 17</b>	<b>20%</b>
	<b>Informative Abstract</b>	<b>Feb. 28</b>	<b>5%</b>
	<b>Oral presentation</b>	<b>March (TBA)</b>	<b>20%</b>
	<b>Thesis</b>	<b>April (TBA)</b>	<b>50%</b>
<b><i>ONLINE QUIZZES OR ASSIGNMENTS:</i></b>	Students are required to complete online modules reviewing topics such as literature review tools and techniques, design of experiments, statistical hypothesis testing, and biomedical research ethics. These modules will ordinarily be completed during the summer portion of the research project.		
<b><i>IN-CLASS PARTICIPATION:</i></b>	Students will contribute to peer evaluation of their classmates' draft research proposals, oral presentations and abstracts, and draft theses. Classroom sessions introducing students to the writing expectations of the course and best practices in peer evaluation will take place during the Fall term.		
<b><i>ENGLISH:</i></b>	In accordance with Senate and Faculty Policy, students may be penalized up to 10% of the marks on all assignments, tests and examinations for the improper use of English. Additionally, poorly written work with the exception of final examinations may be returned without grading. If resubmission of the work is permitted, it may be graded with marks deducted for poor English and/or late submission.		
<b><i>ATTENDANCE:</i></b>	Any student who, in the opinion of the instructor, is absent too frequently from class or laboratory periods in any course, will be reported to the Dean (after due warning has been given). On the recommendation of the School, and with the permission of the Dean, the student will be debarred from taking the regular examination in the course.		
<b><i>CHEATING:</i></b>	University policy states that cheating, including plagiarism, is a scholastic offense. The commission of a scholastic offence is attended by academic penalties which might include expulsion from the program. If you are caught cheating, there will be no second warning. (see Scholastic Offence Policy in the Western Academic Calendar).		
<b><i>SSD:</i></b>	<i>Please contact the course instructor if you require material in an alternate format or if any other arrangements can 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.</i>		
<b><i>NOTE:</i></b>	The above topics and outline are subject to adjustments and changes as needed. Students who have failed an Engineering course (i.e., mark < 50%) must repeat all components of the course. No special permissions will be granted enabling a student to retain laboratory, assignment or test marks from previous years. Previously completed assignments and laboratories cannot be resubmitted for grading by the student in subsequent years.		