

Course Outline (W2013)

BME100: Introduction to Biomedical Engineering

Instructor	Dr. James Andrew Smith Office: ENG434 Phone: (416) 979-5000 ext 4905 Email: jasmith@ee.ryerson.ca Web: www.ee.ryerson.ca/~jasmith/courses/bme100 Twitter: @BME100Prof Office hours: (TBA)
Prerequisites	None
Course Type	Compulsory
Program Level	BME 02 (2 nd Semester)
Website	www.ee.ryerson.ca/~jasmith/courses/bme100
Compulsory Texts	1. <i>none</i>
Reference Text	1. "Introduction to Biomedical Engineering", Second Edition; by John Enderle, Susan M. Blanchard, Joseph Bronzino.
Calendar Description	This course will deal with the terminology of the medical profession; anatomy and physiology of the human body, from overall system and functional approaches; survey of present-day medical measurements and consideration of those areas in which engineering may be applied advantageously to medicine. The course will also include seminars from guest speakers from biomedical profession. Exposure to medical equipment in hospitals, and small animal handling training will also be provided. Bioethics will also be covered in the course. This course is graded on a pass/fail basis.
Learning Objectives	At the end of this course, the successful student will be able to: 1. Summarize and paraphrase written work accurately with appropriate citations; Formulate and express ideas in clear and correct grammar (7a) 2. Organize and deliver clear and formal presentation following established guidelines (7b) 3. Demonstrate functional use of current software for written, oral and graphical communications in engineering contexts (7c) 4. Use figures and tables appropriately to compliment text (7d) 5. Describe ethical issues and how they affect individuals, companies and the public (10a)

Note: Numbers in parentheses (e.g. 10a) refer to the graduate attributes required by the Canadian Engineering Accreditation Board. For more information, see:

http://www.feas.ryerson.ca/quality_assurance/accreditation.pdf

- Course Organization**
- 1 hour of lecture per week for 13 weeks, in 1 section
 - 2 hours of lab/tutorial every two weeks for 13 weeks
 - 4 Lab/tutorial sections of maximum 25 students
 - 2 Teaching Assistants, (lab/tutorial responsibility split between TA's and Lecturer)

Course Evaluation

Participation	20%
Tutorials/Labs	10%
Tweet Concept Statement	10%
One Page Draft	10%
Final Project (Written)	25%
Final Project (Presentation)	25%
<i>Total</i>	<i>100%</i>

Attendance is mandatory. The Participation grade, like the class, is an all-or-nothing component. If the student is found to be absent during class or lab he/she will receive 0 out of 20 on the Participation grade.

Note that BME100 is a pass-fail course. Students with a cumulative grade of 50% or more will be assigned a PSD (Pass) grade.

Examinations

No exams.

Project

Each project combines two equally important components: a written component and a presentation component. Each half is worth 25% of your final grade (they combine to be worth 50% of the final grade). Evaluation will be conducted based on the technical merit and the skill with which the student communicates his or her message. Depending on the project selection the presentation will take the form of a poster session or a formal multimedia presentation.

Three main project categories are permitted:

1. Literature survey
 - Four-page IEEE format literature survey
 - 10-12 minute in-class multimedia presentation
2. Position paper
 - Four-page IEEE format position paper
 - Conference-style poster and formal, in-class / in-lab poster presentation
3. Hands-on project
 - Two-page IEEE format hands-on project report
 - Conference-style poster and formal, in-class / in-lab poster presentation and demonstration.

Week 1 – Review Project topics.

Week 2 – Select Twitter ID and email to Professor Smith. Follow @BME100Prof.

Week 3 – Select project topic (choose the official project list).

Week 4 – Twitter Project concept statement to @BME100Prof

Week 6 - Hand in 1 page draft. (10% of final grade)

Week 7 - Return of 1 page draft.

Week 12 & 13 – Hand in written component (25% of final grade) and present project (25% of final grade) present in lab.

REMARKS

The top three projects and a limited number of runners-up will receive certificates signed by Dr. Smith.

Course Content

Topic	Sections	Hours	Topic, description
Introduction	all	1	- Introduction to BME 100 (30 minutes) - Project Requirements, Structure & Resources (30 minutes)
Writing & Presentation Skills	all	2	- Library resources & search techniques for peer-reviewed articles (30 minutes) - Thesis Statements & Citations and Avoiding Plagiarism (45 minutes) - Posters and Presentations (45 minutes)
Anatomy and Physiology	all	1	- Introduction to Anatomy (30 minutes) - Introduction to Physiology (30 minutes)
Biomedical Engineering Design	all	4	- Case study: Automated External Defibrillators (1 hour) - Manipulators and Surgery, Mobility and Rehabilitation (1 hour) - Seminar Discussion: When Implants Go Bad (1 hour) - Bio-inspired Engineering Design (1 Hour)
Animal Use	all	1	- Animal use in Biomedical Research (Guest Lecture; 1 hour)
Ethics in Biomedical Research	all	4	- Seminar Discussion: Autism and MMR Vaccines (1 hour) - Seminar Discussion: Nancy Olivieri and Apotex (1 hour) - Seminar Discussion: Denial of Science (1 hour) - Seminar Discussion: Taking care of Seniors (1 hour)

Laboratory/Tutorials

Week	Title	Detail	Time	Room
1	No lab	<i>No lab</i>	n/a	n/a
2,3	Annotated bibliographies	<i>Pre-lab:</i> Students are to read the three scientific articles, as well as an IEEE Citation Guide and the Annotated Bibliography handout. <i>Lab:</i> Articles and methodology is reviewed in the first half hour. Then, the students are to create a 50-75 word “Annotated Bibliographies” for each of the three articles. This should take approximately half an hour per article. The work is to be done in class, however any work conducted ahead of time may be used as an aid. Students may bring dictionaries and other writing aids. Computers are not recommended, as the written portion needs to be done on paper.	2 Hours	n/a
4,5	Literature Surveys	<i>Pre-lab:</i> Students are given a list of three bioethics articles to find using the Library’s online catalogue. They must read the articles beforehand, write an annotated bibliography of	2 Hours	n/a

		all three articles and bring them to the tutorial session. <i>Lab:</i> Using the annotated bibliography, the students are to write a 250 word survey of the three articles, linking the three together. No student opinions are to be discussed in this survey. They are also supposed to add a standard IEEE-format bibliography at the end. They are to hand in both the annotated bibliography and the literature survey.		
7	Reading Week	<i>No lab.</i>	n/a	n/a
6,8	Position Papers	<i>Pre-lab:</i> Lab 2 must be completed. <i>Lab:</i> Over the course of the two hours the students are to write a 250 word paper describing their position (opinion) of the three papers reviewed for the literature survey in the previous lab. The position (which is up to the student) is to be backed-up by their literature survey & the surveyed papers. The last page of the document is to be a standard bibliography. They are to hand in both the position (opinion) paper and the bibliography.	2 Hours	n/a
9,10	Hands-On Projects	<i>Content to be announced.</i>	2 Hours	n/a
11,12,13,14	Project Presentation	<i>Pre-lab:</i> Work on your projects. Bring finished project and presentation material to lab. <i>Lab:</i> Each student must present the findings of their final project. Depending on the project selection the presentation will take the form of a poster session or a formal multimedia presentation. Depending on scheduling, some student presentations will take place in the first lab session and the remainder will take place in the second (two weeks later).	4 Hours	n/a

Important Notes

1. All of the required course-specific written reports will be assessed not only on their technical/academic merit, but also on the communication skills exhibited through these reports.
2. All assignment and lab/tutorial reports must have the standard cover page which can be completed and printed from the Department website at www.ee.ryerson.ca. The cover page must be signed by the student(s) prior to submission of the work. Submissions without the cover pages **will not** be accepted.
3. Should a student miss a mid-term test or equivalent (e.g. studio or presentation), with appropriate documentation, a make-up will be scheduled as soon as possible in the same semester. Make-ups should cover the same material as the original assessment but need not be of an identical format. Only if it is not possible to schedule such a make-up may the weight of the missed work be placed on the final exam, or another single assessment. This may not cause that exam or assessment to be worth more than 70% of the student's final grade. If a student misses a scheduled make-up test or exam, the grade may be distributed over other course assessments even if that makes the grade on the final exam worth more than 70% of the final grade in the course.
4. Students who miss a final exam for a verifiable reason and who cannot be given a make-up exam prior to the submission of final course grades, must be given a grade of INC (as outlined in the *Grading*

Promotion and Academic Standing Policy) and a make-up exam (normally within 2 weeks of the beginning of the next semester) that carries the same weight and measures the same knowledge, must be scheduled.

5. Medical or Compassionate documents for the missing of an exam must be submitted within 3 working days of the exam. Students are responsible for notifying the instructor that they will be missing an exam as soon as possible.
6. Requests for accommodation of specific religious or spiritual observance must be presented to the instructor no later than two weeks prior to the conflict in question (in the case of final examinations within two weeks of the release of the examination schedule). In extenuating circumstances this deadline may be extended. If the dates are not known well in advance because they are linked to other conditions, requests should be submitted as soon as possible in advance of the required observance. Given that timely requests will prevent difficulties with arranging constructive accommodations, students are strongly encouraged to notify the instructor of an observance accommodation issue within the first two weeks of classes.
7. The results of the first test or mid-term exam will be returned to students before the deadline to drop an undergraduate course in good Academic Standing.
8. Students are required to adhere to all relevant University policies including:
 - Undergraduate Grading, Promotion and Academic Standing, <http://www.ryerson.ca/senate/policies/pol146.pdf>
 - Student Code of Academic Conduct, <http://www.ryerson.ca/senate/policies/pol60.pdf>
 - Student Code of Non-Academic Conduct, <http://www.ryerson.ca/senate/policies/pol61.pdf>
 - Undergraduate Academic Consideration and Appeals, <http://www.ryerson.ca/senate/policies/pol134.pdf>
 - Examination Policy, <http://www.ryerson.ca/senate/policies/pol135.pdf>
 - Accom. of Student Relig., Abor. and Spir. Observance, <http://www.ryerson.ca/senate/policies/pol150.pdf>
 - Est. of Stud. Email Accts for Official Univ. Commun., <http://www.ryerson.ca/senate/policies/pol157.pdf>
9. Students are required to obtain and maintain a Ryerson Matrix e-mail account for timely communications between the instructor and the students.
10. Any changes in the course outline, test dates, marking or evaluation will be discussed in class prior to being implemented.
11. In-class use of cellular telephones is not permitted. Please turn off your cell phone prior to class. Quiet use of laptops, text-messengers and similar non-audible devices is permitted only in the rear two rows of class. This restriction allows use of such devices by their users while limiting audible and visual distractions to other students. This policy may change without notice.
12. Assignments, projects and/or quizzes handed in past the due date and time will not be accepted for marking and will receive a mark of ZERO.
13. Students found to have plagiarized *any* portion of their final project will receive a grade of zero on the *complete* project. This may lead to a failing overall grade.

Course Developer _____

Date _____

Approved by _____

Date _____

Associate Chair, Program Director
or Department Chair