

BME 701 – Fall 2019
Biomedical Engineering Core I

Course Objective: An Introduction to biomedical engineering. The biological, chemical, electrical, and mechanical principles involved in the design and operation of medical devices and bioprocesses. The engineering research themes of the School of Biomedical Engineering are emphasized: mechanical engineering, biomedical imaging, bioinstrumentation, biomedical technology (e.g. biophotonics and medical robotics) and neurotechnology.

Instructors: Dr. Greg Wohl (ETB 411, ext. 21195) wohlg@mcmaster.ca
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TA: Martin Villegas (villegm@mcmaster.ca)

Lecture Hours: Thursdays (Starting September 12th), 2:30-5:30 pm

Lecture Room: BSB (Burke Science Building) room 115

Assessment: Section Evaluations (e.g., quiz, assignment, paper) **60 %**
- one evaluation per segment, to be assigned by the instructor
- each evaluation is worth 10%

Project **40 %**
Oral PowerPoint presentation (13-15 min) followed by Q and A session (5 min)

Policy Reminder:

The Faculty of Engineering is concerned with ensuring an environment that is free of all discrimination. If there is a problem, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer or the Human Rights Consultant, as the problem occurs.

McMaster University Statement on Academic Dishonesty

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university. It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, specifically Appendix 3, located at:

http://www.mcmaster.ca/senate/academic/ac_integrity.htm

Lecture Schedule

Sept. 12, 19, 26	Dr. Tom Doyle (Instrumentation and Microcontrollers)
Oct. 3, 10	Dr. Qiyin Fang (Optical)
(NOTE: Oct. 17	<i>Fall reading week: no class.</i>
Oct. 24 [†] , 31 [†]	Dr. Greg Wohl (Mechanical Engineering)
Nov. 7, 14	Dr. Jeff Fortuna (Machine Learning)
Nov. 21, 28	Dr. Mike Noseworthy (Medical Imaging)
Dec. 5, 12	Dr. Boyang Zhang (microfluidics, organ-on-chip)
Tuesday Dec. 17 th	Student final presentations (<u>full day</u>).

Some segments could include exposure to faculty research laboratories. These will be *ad hoc*, at the discretion of the faculty member and at times other than in the slotted lectures (agreed upon by whoever in the class is interested).

[†] These lectures will start 1 hour later (i.e. 3:30-6:30pm)

Final presentation

For the final evaluation of the course, you have to prepare a 13-15 minutes (+ 5 minutes for discussion) presentation about a self-chosen topic related to the field of Biomedical Engineering. This topic has to be **COMPLETELY OUT** of your research area and the format of the presentation is also free, however you must answer the following questions.

1. What is the health problem (disease) related to the topic? (You must give an overview of the anatomy/physiology/biology of the problem including updated statistical information about morbidity/mortality)
2. Where within the field of BME does my topic fit?
3. How does my topic address the health problem?
4. What are the engineering principles behind the topic/device/method?
5. What alternatives to my topic/device/method exist to address the problem?
6. What are the advantages/disadvantages of my topic/device/method compared to the others?

IMPORTANT NOTES:

- 1). Your topic topic/device/method can be commercially available or “on-going” research. In any case it has to be approved by the TA of the course.
- 2). In order to avoid repeated topics, a “first come, first served” scheme will be used so the suggestion is that you choose your topic as soon as possible.

In case you have any additional questions please email the TA.