

Electrical Engineering ECE-4BI6 Biomedical Capstone Design Project

2012/2013 Course Outline

Dept. of Electrical and Computer Engineering, Faculty of Engineering, McMaster University

Instructors:

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Course Schedule

The following course schedule is only nominal. There are no lab sections and the lab is open all day and evenings for student work. Lecture and tutorial times will be selected to meet the students' timetables and preferences.

	C01	Mo Th	12:30	13:20	3	T13/123
		Tu	13:30	14:20	3	T13/123
EOW	L01	Th	14:30	17:20	3	ITB/142
EOW	L02	Th	14:30	17:20	3	ITB/142
EOW	L03	Fr	14:30	17:20	3	ITB/142
EOW	L04	Fr	14:30	17:20	3	ITB/142
	T01	Mo	08:30	09:20	3	T13/105
		We				

Course Description

The design process; establishing objectives; preliminary design; planning; scheduling; decision matrices; modeling tools; economic impact; optimization methods; reliability; safety; sustainability demonstrated by a term project conducted by small teams of students.

Three lecture slots, two tutorials slots, two lab slots weekly; both terms.

Prerequisite: Registration in Level IV Electrical and Biomedical Engineering. Anti-requisite: COMP ENG 4OI4, 4OI5, ELEC ENG 4BI4, 4B15, 4OI4, 4OI5

Objectives

To develop a working knowledge of the basic principles of the engineering design process and apply this knowledge to the selection and analysis of a biomedical problem and to propose, design, construct and test a solution. Biomedical engineering areas: medical instrumentation (hardware and/or software) and devices, medical imaging, medical robotics; etc.

New

Biomedical systems are often notorious for being 'un-environmental'. Therefore all projects must contain some aspect of sustainability. For example your device might contain a solar power source. Furthermore, the appropriate tools and metrics available to evaluate the environmental impact of the project must be used and discussed.

Resources

There are no textbooks needed to be purchased. Student groups will be required to purchase materials for their projects. Groups may be provided with some financial support or materials. However, this will be at the discretion of the department and faculty supervisors assisting with the project.

Outline of Lecture Topics

Week	Topic
1	Development processes and Organizations
2	Product Planning
3	Product Specification
4	Professional Standards (Ontario Hydro, CSA, IEC)
5	Concept Generation
6	Product Architecture
7	Report(s) Structure

Format: Full class sessions once per week, or more frequently as required, for 6 weeks to give basic concepts and tutorials in design, followed by independent work and consultation during design and implementation of major term project.

Evaluation

Biomedical Capstone Design Course Component Weightings

TERM 1

Work Item	Due Date	Value
Project Proposal	October 15 th , 2012	40%
Progress Group Presentation/Report	Week of Nov 26 th 2012	60%
Course Mark	Total =	100%

TERM 2

Work Item	Due Date	Value
Progress Group Presentation	Week of Feb 14 th , 2013	30%
Capstone Project Presentation/Report		70%
Course Mark	Total =	100%

Each semester students will evaluate each other's contribution to the group project. This will prevent all the work being done by one person. Furthermore, groups will submit a joint proposal (not individual ones) and will present group presentations (i.e. each member of the group presents on a specific component of the work).

A satisfactory final report must be submitted, else a grade of F will be awarded. In a case where the component weight cannot be fulfilled as a result of unforeseen and/or uncontrollable circumstance(s) in the course operation or execution, the grades assigned to that component may be pro-rated.

Academic Integrity Policy **Policy Reminders**

“The Faculty of Engineering is concerned with ensuring an environment that is free of all adverse discrimination. If there is a problem, that cannot be resolved by discussion among the persons concerned, individuals are reminded they should contact the Departmental Chair, the Sexual Harassment Officer or the Human Rights Consultant, as soon as possible.”

“Students are reminded that they should read and comply with the Statement on Academic Ethics and the Senate Resolutions on Academic Dishonesty as found in the Senate Policy Statements distributed at registration and available at the senate office.”

"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

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained
2. Improper collaboration in group work. (E.g., using previous year's lab reports).
3. Copying or using unauthorized aids in tests and examinations.

Health and Safety

The Faculty of Engineering is committed to McMaster's University Workplace and Environmental Health and Safety Policy which states: "Students are required by University policy to comply with all University health, safety and environmental programs".

It is your responsibility to understand McMaster University Workplace and Environmental Health and Safety programs and policies. For information on these programs and policies please refer to McMaster University Environmental and Health Support Services Occupational Safety Risk Management Manual at:

<http://www.workingatmcmaster.ca/link.php?link=Job+Matters%3APolicy-Manual>

It is also your responsibility to follow any specific Standard Operating Procedures (SOPs) provided for some of the experiments and the laboratory equipment.

Notice

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.