

Carleton University
Department of Systems and Computer Engineering
SYSC 4202 Clinical Engineering, Winter 2011/2012
Course Outline

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Course Objectives:

SYSC4202 Clinical Engineering will introduce students to the profession of Clinical Engineering; a branch of Biomedical Engineering. Topics of discussion and lectures will include an overview of the Canadian Health Care System with examples of other countries; the role of clinical engineering in healthcare; medical technology management in industrialized and developing countries; patient and staff safety considerations; electromagnetic interference; reliability, quality assurance practices; introduction to biomedical sensor and medical technologies; applications of telemedicine; medical technology procurement; the impact of technology on healthcare, and technology assessment. The course provides a good background for students interested in biomedical engineering, clinical engineering, or medical informatics and for students wishing to work in a biomedical and/or healthcare industry.

Pre-Requisites: Fourth (4th) year status in engineering or permission of department

Course Organization:

- Lectures, three (3) hours a week, Mondays, 18:00 to 21:00
- Problem analysis sessions, three (3) hours alternate weeks, Tuesdays, 14:30 to 17:30

Course Curriculum (Draft):

Please note that topics per week are subject to change:

Week	Date	Content
1	Monday, Jan 9 th	Course Outline, Instruction to Biomedical / Clinical Engineering
2	Monday, Jan 16 th	Canadian Health Care System
3	Monday, Jan 23 rd	Introduction to Clinical Engineering, Technology Management
4	Monday, Jan 30 th	Health Technology Management
5	Monday, Feb 6 th	Capital Equipment Procurement, Device Standards
6	Monday, Feb 13 th	Mid-Term Exam
7	Monday, Feb 20 th	Winter Break – no class
8	Monday, Feb 27 th	Sensors and Medical Technology Overview
9	Monday, Mar 5 th	Patient Safety & Risk Management
10	Monday, Mar 12 th	Risk Reporting, Liability, Incident Investigation
11	Monday, Mar 19 th	Education, Research & Development, Telemedicine Technologies
12	Monday, Mar 26 st	Clinical Engineering and Information Technology
13	Monday, Apr 2 nd	Impact of Clinical Engineering on Healthcare
14	TBD	Final Exam

Course Assessment and Requirements:

Quizzes:

There will be ten (10) in-class quizzes to be completed at the beginning of each class. The quizzes will be based on material presented during the previous lecture. 10 minutes will be allowed at the beginning of the lecture to complete the quiz. Each quiz will be graded out of 5. The total marks of the quizzes will constitute 25% of the final mark.

Problem Analysis Sessions:

There will be five (5) problem analysis sessions in which various topics and problems are to be discussed. Attendance will be noted during these sessions. Attendance and discussion participation in the sessions will account for 2 mark each for a total of 10 marks. Students may be asked to hand in notes, provide short oral presentations, or simply engage in discussion during these sessions. The problem analysis sessions will be held on the following days:

Week	Date
2	Tuesday, Jan 17 th
4	Tuesday, Jan 31 st
8	Tuesday, Feb 28 th
10	Tuesday, Mar 13 th
12	Tuesday, Mar 27 th

Examinations:

Mid-term Exam: Counts for **25** marks of the total mark

Final exam: Counts for **40** marks of the total mark. The final exam is for evaluation purposes only and will not be returned to students.

Academic Accommodation

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Pregnancy obligation: Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the [Student Guide](#)

Religious obligation: Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the [Student Guide](#)

Students with Disabilities:

Students with disabilities requiring academic accommodations in this course are encouraged to contact a coordinator at the Paul Menton Centre for Students with Disabilities to complete the necessary letters of accommodation. After registering with the PMC, make an appointment to meet and discuss your needs with me at least two weeks prior to the final exam. This is necessary in order to ensure sufficient time to make the necessary arrangements. Please note the following deadlines for submitting completed forms to the Paul Menton Centre: **March 7, 2012** for the Winter Term.

WebCT

This course will be supported by the WebCT Course Management System. All correspondence with the professor should be carried out through the WebCT e-mail system only. A Discussion group will be available for students, and a variety of resources (both text and online) will be made available through the WebCT site. You must activate your WebCT account by going to webct.carleton.ca and following the links from the "Student Resources" site on the left hand side.

Lecture presentations and information will be provided through the WebCT site. Lecture presentations will be available the night before or morning of the lecture. It is encouraged to monitor the course site for updated lecture notes and article information. Information will be presented in the lecture that may not be necessarily in the presentation notes but is relevant to the course.

Students will be fully responsible for reading and responding appropriately to all information distributed to students through the WebCT Course page. Information provided on this page will be considered to have been provided to all registered students within 24 hours of posting.

Grades:

Grades will be assigned as percentages and alphabetical final grades will be assigned following the percentage equivalents described in the Undergraduate Calendar. Marks for all grade components will be posted on the WebCT Course page. Final letter grades will not be posted until approved by the Dean's office.

Missing Exams:

If you miss the midterm, you must notify the Professor within 24 hours after the date of the exam. A make-up midterm will usually be permitted under two (2) conditions only:

1. Illness
2. Bereavement

Documentation is required to schedule an alternative time for the midterm. If no documentation is provided, you will receive a grade of zero for the midterm. If you do provide appropriate documentation, the TA will contact you to inform you of the make-up midterm location, time, and date. If you miss the final exam, you must contact the appropriate office at the Registrar within the time period specified in the 2010-2011 Undergraduate Calendar. You will need to fully document your application.

Health and Safety:

Every student should have a copy of our Health and Safety Manual. An electronic version of the manual can be found at <http://www.sce.carleton.ca/courses/health-and-safety.pdf>

Plagiarism and Cheating:

It is a serious instructional offense to use or pass off as one's own an idea or product which is the work of another without expressly giving credit to that other. It is also an instructional offense to copy the work of a fellow student. For all assignments, references and sources used to complete the assignment must be explicitly identified. If students do plagiarize or cheat, the Dean's Office will be notified and appropriate action will be taken. Please refer to the section on instructional offences in the Undergraduate Calendar for additional information.

Attendance:

Students are expected to attend all lectures and lab periods as required. The Faculty of Engineering and Design requires students to have a conflict-free timetable, so requests to accommodate missed exams, assignment due dates, project milestones, etc., because of conflicts with other courses, jobs or vacation plans will not be considered. For further clarification please come see me immediately.