

ELEC ENG 4016
Engineering Design
 Fall/Winter 2015/16
 Course Outline

CALENDAR/COURSE DESCRIPTION

The design process; safety; a term project composed of small teams of students including an oral presentation and written report.

PRE-REQUISITES AND ANTI-REQUISITES

Prerequisite(s): Registration in Level IV or V of any Electrical or Computer Engineering program
 Antirequisite(s): COMPENG 40I4, 40I5, ELECENG 4BI4, 4BI5, 4OI4, 4OI5, ENGINEER 4M06 A/B

SCHEDULE

Lectures: C01 and C02: Monday & Thursday 9:30 am – 10:20 am, and Tuesday 10:30 am – 11:20 am
Tutorial: T01 = Monday & Thursday 10:30 am – 11:20 am ; T02 = Monday & Thursday 10:30 am – 11:20 am
Labs: Every Week: L01 Monday 2:30 pm- 5:20 pm ; L02 Tuesday 2:30 pm - 5:20 pm ; L03 Wednesday 2:30 pm - 5:20 pm ; L04 Thursday 2:30 pm - 5:20 pm ; L05 Friday 2:30 pm - 5:20 pm

INSTRUCTOR OFFICE HOURS AND CONTACT INFORMATION

<p> C01 Dr. Xun Li ITB-A313 lixun@mcmaster.ca ext. 27698 </p>	<p> Office Hours: Monday and Thursday 12:00pm-14:00pm Or by appointment </p>
<p> C02 Dr. Steve Hranilovic ITB-A224 hranilovic@mcmaster.ca ext. 27620 </p>	<p> Office Hours: Monday & Thursday 8:30-9:30am By appointment </p>

TEACHING ASSISTANT OFFICE HOURS AND CONTACT INFORMATION

<p> Sangzhi Zhao (C01) ITB-A204 zhaos26@mcmaster.ca ext. 24087 </p>	<p> Chenyu Yang (C01) ITB-A204 yangc55@mcmaster.ca ext. 24087 </p>	<p> Helen Guo (C02) ITB-A204 guohj@mcmaster.ca ext. 24087 </p>	<p> Warren Pawlikowski (C02) ITB-A239 pawlikws@mcmaster.ca ext.26070 </p>	<p> Office Hours: Monday to Friday: 14:30pm- 17:30pm </p>
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COURSE WEBSITE/ALTERNATE METHODS OF COMMUNICATION

<http://www.ece.mcmaster.ca/faculty/hranilovic/teaching/ee4oi6/ee4oi6.html>
<http://www.ece.mcmaster.ca/faculty/li/EE4O16/ee4oi6.html>

COURSE OBJECTIVES

By the end of this course, students should be able to:

- Formulate an engineering problem in a precise manner understanding approximations and risks.
- Be able to select and apply appropriate materials and supplies to tackle design problem.
- Independently acquire knowledge from a variety of sources.
- Work in a group in an effective and efficient manner
- Manage time effectively to achieve project goals.
- Clearly communicate engineering design work in both written and oral formats.
- Understand and articulate the impact of their work on society and stakeholders

ASSUMED KNOWLEDGE

This course applies all acquired knowledge from the program.

COURSE MATERIALS

Required Texts: None.

COURSE OVERVIEW

Date/Week	Topic	Readings
Mid-Sept	Form groups of <i>four</i> and submit the names of project partners via email to TA. Students that are unassigned by this date will be randomly assigned to groups.	
Mid-Oct	<i>Project Proposal Report and Presentation</i> - Each group must prepare a complete description of their project including a detailed literature review. A presentation to the class is required followed by questions regarding the design decisions of the group.	
End of Nov.	<i>Milestone Demonstration/Presentation 1</i> - A short presentation and demonstration of your project will be required of each group. It is expected that you will have at least one third of your project deliverables ready at this demonstration. Individual marks will be assigned to each group member based on their answers to questions and their work.	
Mid Feb	<i>Milestone Demonstration/Presentation 2</i> - A short presentation and	

demonstration of your project will be required of each group. It is expected that you will have at least two thirds of your project deliverables ready at this demonstration. Individual marks will be assigned to each group member based on their answers to questions and their work.

Early April *Final Technical Demonstration* – Students are required to demonstrate the full scope of functionality of their designs. Individual marks assigned to group members based on their answers to questions and their work

April 8, 2016 *ECE Expo* – Students must prepare and present a poster outlining their design and present it to their peers and the community at large. Full or partial demonstration of project operation is encouraged to aid presentation.

LABORATORY OVERVIEW

Not applicable.

LABORATORY OPERATION

The laboratory for this course is in ITB/156. Students will be granted permission to enter room via access cards. No food or drink permitted in lab. Please keep lab clean.

TAs will be in labs during the week to provide technical guidance on projects. A schedule of their lab hours will be posted to course website.

Soldering is not permitted in ITB/156. Please refer to appropriate safety training at:
http://www.ece.mcmaster.ca/ug_cours/Lab_Safety_2015.html

ASSESSMENT

Component	Weight
Meeting Milestones	10%
Project Proposal (report & presentation)	10%
Milestone Demonstration 1	20%
Milestone Demonstration 2	20%
Final Project (report, presentation, demonstration, poster)	40%
Total	100%

All projects must be done in groups of 4 students. Instructor's approval is required for groups with a smaller or larger number of students. Marks are assigned individually and not on a group basis. A satisfactory final report must be submitted, else a grade of "F" in the course will be assigned.

ACCREDITATION LEARNING OUTCOMES

Note: The *Learning Outcomes* defined in this section are measured throughout the course and form part of the Department's continuous improvement process. They are a key component of the accreditation process for the program and will not be taken into consideration in determining a student's actual grade in the course. For more information on accreditation, please ask your instructor or visit: <http://www.engineerscanada.ca>.

Outcomes	Indicators	Measurement Methods(s)
Be able to apply specialize engineering knowledge and mathematics to real design problems.		
Apply approximations, modeling and assumptions to design process.	4.5	Interview
Apply and modify engineering tools to help achieve project goals		
Work effectively as an engineering team to partition and solve a design problem.	6.1 ; 6.2	Final Tech Demo & Interview
Effectively communicate engineering results in written, oral and technical demonstration formats. Both to a technical and non-technical audience.	7.1 ; 7.2 ; 7.3	Proposal presentation & report
Understand the role of engineer in society and her/his duty to the public.	8.3	Interview
Have a deep understanding of how their work impacts economic, environmental and societal aspects.	9.1	Final report
Effectively manage time and scope of project management.	11.2 ; 11.4	Milestone 1&2 progress demos, proposal report
Able to independently acquire and assimilate new knowledge not explicitly taught in curriculum.	12.1 ; 12.2	Interview, Final report
Understands and applies ethical standards to engineering project work, especially between group members.	10.3	Interview

ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour 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 types of academic dishonesty please refer to the Academic Integrity Policy, located at <http://www.mcmaster.ca/academicintegrity>

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.
3. Copying or using unauthorized aids in tests and examinations.

ACADEMIC ACCOMMODATIONS

Students who require academic accommodation must contact Student accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contact by phone at 905.525.9140 ext. 28652 or e-mail at sas@mcmaster.ca. For further information, consult McMaster University's Policy for [Academic Accommodation of Students with Disabilities](#).

NOTIFICATION OF STUDENT ABSENCE AND SUBMISSION OF REQUEST FOR RELIEF FOR MISSED ACADEMIC WORK

1. If you are seeking relief for missed academic work because of an absence lasting less than three days in duration, you must use the [McMaster Student Absence Form](#).
2. Absences lasting more than three days must be reported to the Associate Dean's Office (JHE-A214) and appropriate documentation must be provided. For medical absences, the University reserves the right to require students to obtain medical documentation from the Student Wellness Centre.
3. You should expect to have academic commitments Monday through Saturday but not on Sunday or statutory holidays.
4. Students may submit requests for relief using the MSAF once per term. You must report to the Associate Dean's Office (JHE-A214) for any request for relief in a term where the MSAF has been used previously in that term. Relief for missed academic work is not guaranteed.
5. You are responsible to contact your instructor(s) immediately to discuss the appropriate relief. Failure to do so may negate the opportunity for relief.
6. It is the prerogative of the instructor of the course to determine the appropriate relief for missed term work in his/her course.

NOTICE REGARDING POSSIBLE COURSE MODIFICATION

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.

REFERENCE TO RESEARCH ETHICS

The two principles underlying integrity in research in a university setting are these: a researcher must be honest in proposing, seeking support for, conducting, and reporting research; a researcher must respect the rights of others in these activities. Any departure from these principles will diminish the integrity of the research enterprise. This policy applies to all those conducting research at or under the aegis of McMaster University. It is incumbent upon all members of the university community to practice and to promote ethical behaviour. To see the Policy on Research Ethics at McMaster University, please go to <http://www.mcmaster.ca/policy/faculty/Conduct/ResearchEthicsPolicy.pdf>.

Electrical and Computer Engineering Lab Safety

Information for Laboratory Safety and Important Contacts

This document is for users of ECE instructional laboratories in the Information Technology Building.

This document provides important information for the healthy and safe operation of ECE instructional laboratories. This document is required reading for all laboratory supervisors, instructors, researchers, staff, and students working in or managing instructional laboratories in ECE. It is expected that revisions and updates to this document will be done continually. A McMaster University lab manual is also available to read in every laboratory.

General Health and Safety Principles

Good laboratory practice requires that every laboratory worker and supervisor observe the following:

1. Food and beverages are not permitted in the instructional laboratories.
2. A Laboratory Information Sheet on each lab door identifying potential hazards and emergency contact names should be known.
3. Laboratory equipment should only be used for its designed purpose.
4. Proper and safe use of lab equipment should be known before using it.
5. The course TA leading the lab should be informed of any unsafe condition.
6. The location and correct use of all available safety equipment should be known.
7. Potential hazards and appropriate safety precautions should be determined, and sufficiency of existing safety equipment should be confirmed before beginning new operations.
8. Proper waste disposal procedures should be followed.

Location of Safety Equipment

Fire Extinguisher

On walls in halls outside of labs

First Aid Kit

ITB A111, or dial "88" after 4:30 p.m.

Telephone

Pulls

On the wall of every lab near the door

Fire Alarm

Near all building exit doors on all floors

Who to Contact

Emergency Medical / Security: On McMaster University campus, call Security at extension 88 or 905-522-4135 from a cell phone.

Non-Emergency Accident or Incident: Immediately inform the TA on duty or Course Instructor.

University Security (Enquiries / Non-Emergency): Dial 24281 on a McMaster phone or dial 905-525-9140 ext. 24281 from a cell phone.

See TA or Instructor: For problems with heat, ventilation, fire extinguishers, or immediate repairs

Environmental & Occupational Health Support Services (EOHSS): For health and safety questions dial 24352 on a McMaster phone or dial 905-525-9140 ext. 24352 from a cell phone.

ECE Specific Instructional Laboratory Concerns: For non-emergency questions specific to the

In Case of a Fire (Dial 88)

When calling to report a fire, give name, exact location, and building.

1. Immediately vacate the building via the nearest Exit Route. Do not use elevators!
2. Everyone is responsible for knowing the location of the nearest fire extinguisher, the fire alarm, and the nearest fire escape.
3. The safety of all people in the vicinity of a fire is of foremost importance. But do not endanger yourself!
4. In the event of a fire in your work area shout "*Fire!*" and pull the nearest fire alarm.
5. Do not attempt to extinguish a fire unless you are confident it can be done in a prompt and safe manner utilizing a hand-held fire extinguisher. Use the appropriate fire extinguisher for the specific type of fire. Most labs are equipped with Class A, B, and C extinguishers. Do not attempt to extinguish Class D fires which involve combustible metals such as magnesium, titanium, sodium, potassium, zirconium, lithium, and any other finely divided metals which are oxidizable. Use a fire sand bucket for Class D fires.
6. Do not attempt to fight a major fire on your own.
7. If possible, make sure the room is evacuated; close but do not lock the door and safely exit the building.

Clothing on Fire

Do not use a fire extinguisher on people

1. Douse with water from safety shower immediately or
2. Roll on floor and scream for help or
3. Wrap with fire blanket to smother flame (a coat or other nonflammable fiber may be used if blanket is unavailable). Do not wrap a standing person; rather, lay the victim down to extinguish the fire. The blanket should be removed once the fire is out to disperse the heat.

Equipment Failure or Hazard

Failure of equipment may be indicative of a safety hazard - You must report all incidents.

Should you observe excessive heat, excessive noise, damage, and/or abnormal behaviour of the lab equipment:

1. Immediately discontinue use of the equipment.
2. In Power Lab, press wall-mounted emergency shut-off button.
3. Inform your TA of the problem.
4. Wait for further instructions from your TA.
5. TA must file an incident report.

Protocol for Safe Laboratory Practice

Leave equipment in a safe state for the next person - if you're not sure, ask!

In general, leave equipment in a safe state when you finish with it. When in doubt, consult the course TA.

Defined Roles

TA	The first point of contact for lab supervision	
ECE Lab Supervisor	Steve Spencer- ITB 147	steve@mail.ece.mcmaster.ca
ECE Chair	Tim Davidson- ITB A111	davidson@mcmaster.ca
ECE Administrator	Kerri Hastings- ITB A111	hastings@mcmaster.ca
ECE Course Instructor	Please contact your specific course instructor directly	