Department of Electrical, Computer, & Biomedical Engineering
Faculty of Engineering & Architectural Science

Course Outline (F2018)

ELE700: Engineering Design

Instructor(s)	Xavier Fernando [Coordinator] Office: ENG437 Phone: (416) 979-5000 x 6077 Email: fernando@ryerson.ca Office Hours: Fridays 2-4 PM Alagan Anpalagan Office: ENG447 Phone: (416) 979-5000 x 6079 Email: alagan@ryerson.ca Office Hours: TBA Balasubramanian Venkatesh Office: ENG320 Phone: (416) 979-5000 x 2232 Email: bala@ryerson.ca Office Hours: TBA Truman Yang Office: ENG435 Phone: (416) 979-5000 x 4175 Email: cungang@ryerson.ca Office Hours: TBA David Xu Office: ENG333 Phone: (416) 979-5000 x 6075 Email: dxu@ryerson.ca Office Hours: Thursday 3-5PM Ebrahim Bagheri Office: ENG316 Phone: (416) 979-5000 x 7953 Email: bagheri@ryerson.ca Office Hours: TBA Farah Mohammadi Office: ENG461 Phone: (416) 979-5000 x 6094 Email: fmohamma@ryerson.ca Office Hours: TBD Gul Khan Office: ENG448 Phone: (416) 979-5000 x 6084 Email: gnkhan@ryerson.ca Office Hours: Wednesday 2:00-3:00PM Ling Guan Office: ENG315 Phone: (416) 979-5000 x 6072 Email: lguan@ryerson.ca Office Hours: TBA Mike Kassam Office: ENG470 Phone: (416) 979-5000 x 6103 Email: mkassam@ryerson.ca Office Hours: Refer to Course Webpage

Nagi Mekhiel
Office: ENG446
Phone: (416) 979-5000 x 7251
Email: nmekhiel@ryerson.ca
Office Hours: TU 11-12, Th 10-11

Richard Cheung
Office: ENG330
Phone: (416) 979-5000 x 6112
Email: cheung@ryerson.ca
Office Hours: TBA

Sheikh Karim
Office: ENG334
Phone: (416) 979-5000 x 6111
Email: skarim@ryerson.ca
Office Hours: TBA

Calendar Description	This one term course has two objectives. (1) The lectures provide students with advice on design, project management, reliability, practical advice on software, circuits and components and the documentation of their work. The lectures are organized as a seminar series presented by the faculty lab coordinators and practising engineering professionals. The seminar series\' goal is to provide students with knowledge that will assist them with project design and implementation. (2) The laboratory component of the course provides students with an opportunity to select a project to be completed in the Winter semester course ELE 800 Design Project. Students search information, design and source components in consultation with the faculty lab coordinators who will supervise their projects in the Winter term. Project topics are provided from which students select a topic. Students are also encouraged to submit their own topics for approval.
Prerequisites	COE 538, ELE 504, ELE 531, ELE 635, ELE 639 and [(ELE 604 and ELE 614) or (ELE 604 and ELE 632) or (ELE 604 and ELE 637) or (ELE 614 and ELE 632) or (ELE 632 and ELE 637)]
Antirequisites	None
Corequisites	None
Compulsory Text(s):	1. Teamwork and Project Management, K. Smith, 3rd edition, McGraw Hill, 2004.
Reference Text(s):	1. Design Concepts for Engineers, M. Horenstein, 3rd edition, Prentice Hall, 2006. 2. Engineering Design, R. Eggert, Pearson Prentice Hall, 2005. 3. Fundamentals of Engineering Design, B. Hyman, Prentice Hall, 2003. 4. Design for Electrical and Computer Engineers, J. Salt and R. Rothery, John Wiley & Sons, Inc., 2002.

Learning Objectives (Indicators)	At the end of this course, the successful student will be able to: 1. Develop student's ability and technical skills to make decisions in engineering designs using judgement in solving problems with uncertainty and imprecise information, and selecting optimal choice among alternatives applying known constraints identified in the project definition. (**2a**) 2. Predict user needs, define design parameters, and identify constraints in the process of defining Engineering Design Project (EDP). (**4b**), (**4a**) 3. Develop student's ability and technical skills to make decisions in engineering designs using judgement in solving problems with uncertainty and imprecise information, and selecting optimal choice among alternatives applying known constraints identified in the project definition. (**4c**) 4. Train students with project management and teamwork skills, which includes leadership, organization, planning, motivation, conflict resolution, design process management cooperation and contribution, decomposing project into key tasks, determining tasks, interrelationship, and managing project to meet budge and time line. (**6b**), (**6a**), (**11b**) 5. Demonstrates written and oral communication skill through the ability of constructing effective arguments and drawing conclusions using evidence in discussing design choices, using technical vocabulary, and presenting information clearly and concisely. (**7a**), (**7b**) 6. Build up students' creative thinking and capabilities of conducting research/interconnecting various engineering knowledge to formation of realistic designs. Recognize the need for self-education and developing relationships with experts in the field. (**12b**) **NOTE:** *Numbers in parentheses refer to the graduate attributes required by the Canadian Engineering Accreditation Board (CEAB).*
Course Organization	1.0 hours of lecture per week for 13 weeks 1.0 hours of lab/tutorial per week for 12 weeks
Teaching Assistants	TBA
Course Evaluation	

Design Process and Project Management Exam	25 %
Weekly Project Progress	10 %
Seminars Attendances and Quizzes	10 %
Project Oral Exam	20 %
Final written report summarizing design activities	35 %
TOTAL:	100 %

Examinations	Course evaluation will be based on students' performance and design reports.
	
	Note: Each project group consists of 3 students. Each student will be evaluated individually.
	
	Examination on "Design Process and Project Management" is carried out in Week 6.
	
	Students must attend specified seminars and submit project milestones (Week 8) and weekly (Weeks 9 to 11) project progress reports to their FLC for evaluation prior to meeting with their FLCs.
	
	The final written reports will be assessed not only on their technical merit, but also on the communication skills of their author as exhibited through the reports. The written report will be evaluated as follows:
	
	i) Introduction and Objective
	  -Statement of the problem, clarification of need and requirements
	
	ii) Approach and Methods
	  -Relevant literature review, use of suitable engineering concepts and methods
	  -Alternative design approaches examined and analyzed
	
	iii) Design Analysis & Synthesis
	  -Design specifications, challenges and methodology
	  -Use of modern concepts and methods for data gathering, analysis, and synthesis
	  -Charts on the design process
	
	iv) Technical Writing and General Organization
	  -English, spelling, conciseness, clarity, cover page, index, sequence of chapters, references, appendices, overall adequacy, and integration of the report

Other Evaluation Information	Approved Project List In order to assist students in selecting a suitable project, a list of EDP Topics is posted on the Departmental EDP Web site (http://www.ee.ryerson.ca/capstone/). All topics are 3-student projects. Each project on the list has been approved as a possible design project. The Web site description contains a preamble that gives an overview of the project and explains why it is of interest. Partial specifications, objectives, and suggested approach are included.

	Project Cost Equipment, and Laboratories
	This course presents administrators with a major challenge in coordination. There is a broad project spectrum as each person, in the entire fourth-year student body, selects a unique project. Laboratory resources must be managed to ensure their adequacy, longevity, student safety, and security. Students are to be placed with a FLC who can advise them.
	Role of Faculty Laboratory Coordinator (FLC)
	1. Ensure that the minimum 50% design component is in each project under their supervision.
	2. Provide, where feasible, technical and project management advice without unduly removing the challenge from the student.
	3. Advise the student, where necessary and possible, in the acquisition of parts, test equipment, and specialized laboratory facilities, as required.
	4. Monitor the student's weekly progress during the two hours of lab sessions.
Other Information	5. Evaluate the overall project results based on performance on their project, milestone demonstration, and design content in the engineering project report.
	Role of Faculty Advisor (FA)
	The FA is a faculty member who has voluntarily suggested a project or is formally or informally advising the student. When a FA generates a project, the FA is acknowledged in the Engineering Design description. A FA may or may not be interested in assisting the student beyond the project generation phase. As a courtesy, the student should always discuss the project with the FA when one exists and establish the nature and extent of any advice the FA wishes to provide. Upon project completion, in the Winter Term, it is suggested that the student provide an Engineering Design report copy to the FA if the advisor so wishes. This copy does not have to be bound.
	Scope of EDP
	The project component ELE 700 will make significant demands on the student's time. The key to completing all aspects of this course is to carefully define reasonable limits to what is being undertaken and to budget time on a regular basis to minimize last minute rushes. Two-hour lab sessions per week are assigned in Week 7 to 13. In these lab sessions, the student has the chance to discuss challenges that arise and log their progress in their project with their FLC. As stated earlier, the intended value of the engineering design project is to provide a major experience in engineering design. Therefore, it is important that the project is thoroughly researched and well under way in ELE 700 during the Fall Term and a plan of actions for the Winter Term course ELE 800 is carefully drawn up. Your FLC may refuse to assist the student who has not made a reasonable effort to solve their problem.
	Ultimately, the successful completion of the project is the sole responsibility of the student.

Course Content

Week	Hours	Chapters / Section	Topic, description
1	2		Course coordinators explain the course outline. The EDP topics can be browsed from a published list of topics on the course web site early in the term in accordance with the enclosed schedule. All topics are 3-student projects. Students will pick topics based on their 'EDP Intention Priorities'.
2	2		In Week 2 lecture hours a seminar on "Design Process and Project Management" is scheduled.
3-5	6		In Weeks 3 to 5 students carry out studies on their interested topics. Students meet with the professors teaching this course termed the Faculty Lab Coordinators (FLCs) to discuss their project topics available for student selection and the design challenges for those projects.

6	2		In Week 6 lecture hours students must do an examination (25% of total course grade) on the subject of Design Process and Project Management. Teams with Topic Intention (first batch) select a topic in their area of interest. The topic selection procedure is describe in detail at https://www.ee.ryerson.ca/capstone/elecoetopicreservation.html
7	2		Teams without topic intentions (second batch) select from the remaining topics. If a student team did not select any topic till the end of week 7 the topic assignment will be done by the Department computer system from the remaining listed topics. The procedure of the computer selection will be announced.
8-12	10		During Weeks 8 to 12 students either attend seminars or carry out design work in a specific location or laboratory and report to their designated FLC. Seminars are team-taught by the guest speakers or FLCs. These seminars will be scheduled and announced on the course D2L.
13	2		During Week 13 students must do their Oral Exam with their designated FLCs and electronically submit their Final Report.

Laboratory/Tutorials/Activity Schedule

Week	Lab	Description
1	ENG103	EDP Coordinators present the course outline and management policies.
2-3	ENG103	Dr. M. Jaseemuddin describes the design process and project management seminar
3-5	TBA	Students review the topics.
6	ENG103	** Design Process and Project Management Exam at ENG103 Computer Selection of Topics (First Batch)
7	TBA	Computer Selection of Topics (Second Batch)
8	TBA	Students meet with their assigned FLCs
9	TBA	**Project milestones submitted to the FLCs.
10	ENG103	1. Guest Speaker and FLCs Seminar 2. Lab Weekly progress report #1 submitted to the FLCs.
11	ENG103	1. Guest Speaker and FLCs Seminar 2. Lab Weekly progress report #2 submitted to the FLCs.
12	ENG103	1. Guest Speaker and FLCs Seminar 2. Lab Weekly progress report #3 submitted to the FLCs.
13	TBA	Project Design Oral Exam Final Report Submission.

Policies & Important Information:

1. Students are required to obtain and maintain a Ryerson e-mail account for timely communications between the instructor and the students;
2. Any changes in the course outline, test dates, marking or evaluation will be discussed in class prior to being implemented;
3. Assignments, projects, reports and other deadline-bound course assessment components handed in past the due date will receive a mark of ZERO, unless otherwise stated. Marking information will be made available at the time when such course assessment components are announced.
4. If you have taken the course previously and are currently looking to get a laboratory exemption, then you must fill out this form: http://www.ee.ryerson.ca/guides/ECE-LabExemptionForm.pdf
5. Refer to our **Departmental FAQ** page for information on common questions and issues at the following link: https://www.ee.ryerson.ca/guides/Student.Academic.FAQ.html.

Missed Classes and/or Evaluations

When possible, students are required to inform their instructors of any situation which arises during the semester which may have an adverse effect upon their academic performance, and must request any consideration and accommodation according to the relevant policies as far in advance as possible. Failure to do so may jeopardize any academic appeals.

1. *Health certificates* - If a student misses the deadline for submitting an assignment, or the date of an exam or other evaluation component for health reasons, they should notify their instructor as soon as possible, and submit a Ryerson Student Health Certificate AND an Academic Consideration Request form within 3 working days of the missed date. Both documents are available at https://www.ryerson.ca/senate/forms/medical.pdf.. **If you are a full-time or part-time degree student, then you submit your forms to your own program department or school;**
2. *Religious, Aboriginal and Spiritual observance* - If a student needs accommodation because of religious, Aboriginal or spiritual observance, they must submit a Request for Accommodation of Student Religious, Aboriginal and Spiritual Observance AND an Academic Consideration Request form within the first 2 weeks of the class or, for a final examination, within 2 weeks of the posting of the examination schedule. If the requested absence occurs within the first 2 weeks of classes, or the dates are not known well in advance as they are linked to other conditions, these forms should be submitted with as much lead time as possible in advance of the absence. Both documents are available at www.ryerson.ca/senate/forms/relobservforminstr.pdf. **If you are a full-time or part-time degree student, then you submit the forms to your own program department or school;**
3. *Academic Accommodation Support* - Before the first graded work is due, students registered with the Academic Accommodation Support office (AAS - www.ryerson.ca/studentlearningsupport/academic-accommodation-support) should provide their instructors with an Academic Accommodation letter that describes their academic accommodation plan.

Academic Integrity

Ryerson's Policy 60 (the Academic Integrity policy) applies to all students at the University. Forms of academic misconduct include plagiarism, cheating, supplying false information to the University, and other acts. The most common form of academic misconduct is plagiarism - a serious academic offence, with potentially severe penalties and other consequences. It is expected, therefore, that all examinations and work submitted for evaluation and course credit will be the product of each student?s individual effort (or an authorized group of students). Submitting the same work for credit to more than one course, without instructor approval, can also be considered a form of plagiarism.

Suspicions of academic misconduct may be referred to the Academic Integrity Office (AIO). Students who are found to have committed academic misconduct will have a Disciplinary Notation (DN) placed on their academic record (not on their transcript) and will normally be assigned one or more of the following penalties:

1. A grade reduction for the work, ranging up to an including a zero on the work (minimum penalty for graduate work is a zero on the work);
2. A grade reduction in the course greater than a zero on the work. (Note that this penalty can only be applied to course components worth 10% or less, and any additional penalty cannot exceed 10% of the final course grade. Students must be given prior notice that such a penalty will be assigned (e.g. in the course outline or on the assignment handout);
3. An F in the course;
4. More serious penalties up to and including expulsion from the University.

The unauthorized use of intellectual property of others, including your professor, for distribution, sale, or profit is expressly prohibited, in accordance with Policy 60 (Sections 2.8 and 2.10). Intellectual property includes, but is not limited to:

1. Slides
2. Lecture notes
3. Presentation materials used in and outside of class
4. Lab manuals
5. Course packs
6. Exams

For more detailed information on these issues, please refer to the Academic Integrity policy (https://www.ryerson.ca/senate/policies/pol60.pdf) and to the Academic Integrity Office website (https://www.ryerson.ca/academicintegrity/).

Important Resources Available at Ryerson

1. The Library (https://library.ryerson.ca/) provides research workshops and individual assistance. Inquire at the Reference Desk on the second floor of the library, or go to library.ryerson.ca/guides/workshops
2. Student Learning Support (https://www.ryerson.ca/studentlearningsupport) offers group-based and individual help with writing, math, study skills and transition support, and other issues.

Approved by: _____   Date _____

                  Course Instructor

Approved by: _____   Date _____

Associate Chair or Program Director