

Course Outline (F2016)

ELE 700: Engineering Design

Faculty Lab Coordinators (FLCs)	Drs. V. Geurkov (C), A. Anpalagan, R. Cheung, M. Jaseemuddin, S. Karim, M. Kassam, N. Mekhiel, F. Mohammadi, K. Raahemifar, B. Venkatesh (M. Awadallah), D. Xu, T. Yang, F. Yuan
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 practicing 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.
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)]
Compulsory Text(s):	<i>Teamwork and Project Management</i> , K. Smith, 3 rd edition, McGraw Hill, 2004.
Reference Text(s)	<ol style="list-style-type: none"> 1. <i>Design Concepts for Engineers</i>, M. Horenstein, 3rd edition, Prentice Hall, 2006. 2. <i>Engineering Design</i>, R. Eggert, Pearson Prentice Hall, 2005. 3. <i>Fundamentals of Engineering Design</i>, B. Hyman, Prentice Hall, 2003. 4. <i>Design for Electrical and Computer Engineers</i>, J. Salt and R. Rothery, John Wiley & Sons, Inc., 2002.
Learning Objectives (Indicators)	<p>At the end of this course, the successful student will be able to:</p> <ol style="list-style-type: none"> 1. Predict user needs, define design parameters, and identify constraints in the process of defining Engineering Design Project (EDP). (4b) 2. Develop students' ability and technical skills to make decisions in engineering designs using judgment in solving problems with uncertainty and imprecise information, and selecting optimal choice among alternatives applying known constraints identified in the project definition. (4g,2a) 3. 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) 4. Demonstrates team building and project management knowledge through inter-personal skills, team dynamics, understanding of systematically decomposing project into key tasks, determining tasks inter-relationship, and managing project to meet budget and time line. (6b,11b) 5. Demonstrate ability to assimilate existing knowledge of the field, understand how literature is produced and maintain currency. (12b) <p>NOTE: Numbers in parentheses refer to the graduate attributes required by the Canadian Engineering Accreditation Board (CEAB).</p>
Course Organization	<p>The engineering design projects are selected from a published list of project topics on the course web site, early in the term in accordance with the enclosed schedule. <u>All topics are 3-student projects.</u></p> <p>In Weeks 2 to 3, students carry out studies on their interested topics. Students meet with the professors supervising this course termed the Faculty Lab Coordinators (FLCs) to discuss their project</p>

topics available for student selection and the design challenges for those projects.

In Weeks 4 lecture hours, a seminar on “Design Process and Project Management” is scheduled.

Students must select their project topics by **the end of week 5** according to the procedure described at <http://www.ee.ryerson.ca/capstone/topicreservation.html>. If a student team did not select any topic till the end of week 5, 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.

In Week 6 lecture hours, students must do an examination (25% of total course grade) on the subject of Design Process and Project Management.

During Weeks 7 to 11, 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.

During Weeks 12 and 13, students must do their Oral Exam with their designated FLCs and electronically submit their Final Report.

Hours: 2 hours per week

Course evaluation will be based on students' performance and design reports.

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%

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

**Course
Evaluation**

<p>Approved Project List</p>	<p>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/).</p> <p>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.</p>																																												
<p>Activity Schedule</p>	<table border="1"> <thead> <tr> <th data-bbox="367 390 574 422">Week</th> <th data-bbox="574 390 862 422">Presenters/ Evaluators</th> <th data-bbox="862 390 1435 422">Activities</th> </tr> </thead> <tbody> <tr> <td data-bbox="367 422 574 485">1 Sep 5-11</td> <td data-bbox="574 422 862 485">EDP Coordinator</td> <td data-bbox="862 422 1435 485">Course Management</td> </tr> <tr> <td data-bbox="367 485 574 548">2 Sep 12-18</td> <td data-bbox="574 485 862 548"></td> <td data-bbox="862 485 1435 548">Studying and Selection of Topics</td> </tr> <tr> <td data-bbox="367 548 574 611">3 Sep 19-25</td> <td data-bbox="574 548 862 611"></td> <td data-bbox="862 548 1435 611">Studying and Selection of Topics</td> </tr> <tr> <td data-bbox="367 611 574 674">4 Sep 26-Oct 2</td> <td data-bbox="574 611 862 674">Dr. M. Jaseemuddin</td> <td data-bbox="862 611 1435 674">Design Process and Project Management Seminar</td> </tr> <tr> <td data-bbox="367 674 574 737">5 Oct 3-9</td> <td data-bbox="574 674 862 737"></td> <td data-bbox="862 674 1435 737">Computer Selection of Topics</td> </tr> <tr> <td data-bbox="367 737 574 800">6 Oct 10-16</td> <td data-bbox="574 737 862 800">FLCs</td> <td data-bbox="862 737 1435 800">Design Process and Project Management Exam</td> </tr> <tr> <td data-bbox="367 800 574 863">7 Oct 17-23</td> <td data-bbox="574 800 862 863">FLCs</td> <td data-bbox="862 800 1435 863">Students meet with their assigned FLCs</td> </tr> <tr> <td data-bbox="367 863 574 926">8 Oct 24-Oct 30</td> <td data-bbox="574 863 862 926">FLCs</td> <td data-bbox="862 863 1435 926">Project Milestones submitted to the FLCs</td> </tr> <tr> <td data-bbox="367 926 574 989">9 Oct 31-Nov 6</td> <td data-bbox="574 926 862 989">Guest Speaker/ FLCs</td> <td data-bbox="862 926 1435 989">Seminar/ Lab Weekly Progress Report #1 submitted to the FLCs</td> </tr> <tr> <td data-bbox="367 989 574 1052">10 Nov 7-13</td> <td data-bbox="574 989 862 1052">Guest Speaker/ FLCs</td> <td data-bbox="862 989 1435 1052">Seminar/ Lab Weekly Progress Report #2 submitted to the FLCs</td> </tr> <tr> <td data-bbox="367 1052 574 1115">11 Nov 14-20</td> <td data-bbox="574 1052 862 1115">Guest Speaker/ FLCs</td> <td data-bbox="862 1052 1435 1115">Seminar/ Lab Weekly Progress Report #3 submitted to the FLCs</td> </tr> <tr> <td data-bbox="367 1115 574 1178">12 Nov 21-27</td> <td data-bbox="574 1115 862 1178">FLCs</td> <td data-bbox="862 1115 1435 1178">Project Design Oral Exam</td> </tr> <tr> <td data-bbox="367 1178 574 1241">13 Nov 28-Dec 4</td> <td data-bbox="574 1178 862 1241">FLCs</td> <td data-bbox="862 1178 1435 1241">Project Design Oral Exam, Final Report Submission</td> </tr> </tbody> </table>			Week	Presenters/ Evaluators	Activities	1 Sep 5-11	EDP Coordinator	Course Management	2 Sep 12-18		Studying and Selection of Topics	3 Sep 19-25		Studying and Selection of Topics	4 Sep 26-Oct 2	Dr. M. Jaseemuddin	Design Process and Project Management Seminar	5 Oct 3-9		Computer Selection of Topics	6 Oct 10-16	FLCs	Design Process and Project Management Exam	7 Oct 17-23	FLCs	Students meet with their assigned FLCs	8 Oct 24-Oct 30	FLCs	Project Milestones submitted to the FLCs	9 Oct 31-Nov 6	Guest Speaker/ FLCs	Seminar/ Lab Weekly Progress Report #1 submitted to the FLCs	10 Nov 7-13	Guest Speaker/ FLCs	Seminar/ Lab Weekly Progress Report #2 submitted to the FLCs	11 Nov 14-20	Guest Speaker/ FLCs	Seminar/ Lab Weekly Progress Report #3 submitted to the FLCs	12 Nov 21-27	FLCs	Project Design Oral Exam	13 Nov 28-Dec 4	FLCs	Project Design Oral Exam, Final Report Submission
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<p>Project Cost, Equipment, and Laboratories</p>	<p>Project costs for components and other supplies will be borne by the students. Some specialized components may be provided by the Department. This will be noted in the project description. Students should carefully assess the cost implications of a particular project before making a commitment. Requests for equipment or laboratory usage outside of your scheduled lab hours should be directed to your FLC.</p>																																												
<p>Roles of FLC & FA</p>	<p>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.</p> <p>Role of Faculty Laboratory Coordinator (FLC)</p> <ol style="list-style-type: none"> 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. 5. Evaluate the overall project results based on performance on their project, milestone demonstration, and design content in the engineering project report 																																												

	<p>Role of Faculty Advisor (FA)</p> <p>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. <u>This copy does not have to be bound.</u></p>
<p>Scope of EDP</p>	<p>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.</p> <p><i>Ultimately, the successful completion of the project is the sole responsibility of the student.</i></p>

Important Notes

1. All of the required course-specific written reports will be assessed not only on their technical/academic merit, but also on the communication skills exhibited through these reports.
2. All assignment and lab/tutorial reports must have the standard cover page which must be signed by the student(s) prior to submission of the work. Submissions without the cover page **will not** be accepted. The cover page can be found on the departmental web site: [Standard Assignment/Lab Cover Page](#)
3. Should a student miss a mid-term test or equivalent (e.g. studio or presentation), with appropriate documentation, a make-up assessment **may** be scheduled. Alternatively, the weight of the missed work is placed on the final exam, or another single assessment. This may not cause that exam or assessment to be worth more than 70% of the student's final grade. If a student misses a scheduled make-up test or exam, the grade may be distributed over other course assessments even if that makes the grade on the final exam worth more than 70% of the final grade in the course. Make-up assessments cover the same material as the original assessment but need not be of an identical format.
4. Students who miss a final exam for a verifiable reason and who cannot be given a make-up exam prior to the submission of final course grades, must be given a grade of INC (as outlined in the *Grading Promotion and Academic Standing Policy*) and a make-up exam (normally within 2 weeks of the beginning of the next semester) that carries the same weight and measures the same knowledge, must be scheduled.
5. Medical or Compassionate documents for the missing of an exam must be submitted within 3 working days of the exam. Students are responsible for notifying the instructor that they will be missing an exam as soon as possible.
6. **If a student is requesting accommodation due to a religious, aboriginal and/or spiritual observance, he or she must submit a Request for Accommodation of Student Religious, Aboriginal, and Spiritual Observance AND an Academic Consideration form within the FIRST TWO WEEKS OF CLASS or, for a final examination, within two weeks of the posting of the examination schedule.** If the required absence occurs within the first two 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 required absence.
Both documents are available at <http://www.ryerson.ca/senate/forms/reobservforminstr.pdf>. Full-time or part-time degree students must submit the forms to their own program department or school.
7. The results of the first test or mid-term exam will be returned to students before the deadline to drop an undergraduate course in good Academic Standing.

8. Students are required to adhere to all relevant University policies including:
 - Undergraduate Grading, Promotion and Academic Standing: <http://www.ryerson.ca/senate/policies/pol46.pdf>
 - Student Code of Academic Conduct: <http://www.ryerson.ca/senate/policies/pol60.pdf>
 - Student Code of Non-Academic Conduct: <http://www.ryerson.ca/senate/policies/pol61.pdf>
 - Undergraduate Academic Consideration and Appeals: <http://www.ryerson.ca/senate/policies/pol134.pdf>
 - Examination Policy: <http://www.ryerson.ca/senate/policies/pol135.pdf>
 - Course Management Policy: <http://www.ryerson.ca/senate/policies/pol145.pdf>
 - Accommodation of Student Religious, Aboriginal and Spiritual Observance: <http://www.ryerson.ca/senate/policies/pol150.pdf>
 - Establishment of Student E-mail Accounts for Official University Communication: <http://www.ryerson.ca/senate/policies/pol157.pdf>
9. Students are required to obtain and maintain a Ryerson e-mail account for timely communications between the instructor and the students.
10. Any changes in the course outline, test dates, marking or evaluation will be discussed in class prior to being implemented.
11. Assignments, projects, reports and other deadline-bound course assessment components handed in past the due date will receive a mark of ZERO. Marking information will be made available at the time when such course assessment components are announced.
12. 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>

Approved by: _____
Course Instructor

Date _____

Approved by: _____
Associate Chair or Program Director

Date _____