Carleton UNIVERSITY | Department of Systems and Computer Engineering

SYSC 4907
Engineering Project

Calendar description

Student teams develop professional-level experience by applying previously acquired knowledge to a major design project. Lectures discuss project-related issues and student presentations. A project proposal, interim report, oral presentations, and a comprehensive final report are required.

Includes: Experiential Learning Activity.

Lecture one hour a week, laboratory seven hours a week.

http://calendar.carleton.ca/undergrad/courses/SYSC/

Prerequisites

Fourth-year status in Engineering and ECOR 4995 (may be taken concurrently). Certain projects may have additional prerequisites.

Lecture one hour a week, laboratory seven hours a week.

Prior knowledge

Fourth-year status in Engineering and ECOR 4995 (may be taken concurrently). Certain projects may have additional prerequisites. Students who have not satisfied the prerequisites for this course must either withdraw from the course or obtain a prerequisite waiver by visiting the Engineering Undergraduate Academic Support Office.

Course objectives

The 4th-year project is an important part of your undergraduate program. It allows teams of students to develop professional-level experience by applying, honing, integrating and extending previously acquired knowledge and skills in a major engineering design project. The project shall be an example of good engineering analysis and design that demonstrates your skill in the practice of engineering. The project shall tackle a problem for which there may be several different solutions. The end product will vary widely, with some projects focused more heavily on design, analysis, implementation or experimentation.

Every project should include appropriate use of engineering economics, criteria-based decision-making and risk. The written report in every project must include a discussion of alternative design solutions, which should be compared using clearly defined criteria based on technical merit and, as appropriate, on engineering economics and risk

analysis. Every student is expected to produce a contribution that is beyond the background material provided.

Learning outcomes

The 4th-year project covers a wide range of different learning outcomes. Technical learning outcomes will depend on the specifics of each project. We require students to reflect and to comment on how the project relates to their degree program (in both the proposal and the final report). Non-technical learning outcomes cover a wide range of essential skills that are captured by the Graduate Attributes listed below, including professional practice and behaviour, teamwork and leadership skills, presentation skill, time management skills, and others. The degree to which students have achieved these learning outcomes will be measured by the project supervisor through a range of different evaluation approaches, including but not limited to: the quality of written reports, observations during regular meetings, peer evaluations, demos and presentations, etc.

Graduate Attributes (GAs)

The Canadian Engineering Accreditation Board requires graduates of engineering programs to possess 12 attributes at the time of graduation. Activities related to the learning outcomes listed above are measured throughout the course and are part of the department's continual improvement process. Graduate attribute measurements will not be taken into consideration in determining a student's grade in the course. For more information, please visit: https://engineerscanada.ca/.

Graduate Attribute	Learning outcome(s)
2.1: Problem Analysis: Problem definition	
2.2: Problem Analysis: Approach to the problem	
2.3: Problem Analysis: Use of assumptions	
2.4: Problem Analysis: Interpreting the solution – validity of results	
3.1: Investigation: Complex problem assessment	
3.2: Investigation: Design experiment	
3.3: Investigation: Experimental procedure	
3.4: Investigation: Data reduction methods and results	
3.5: Investigation: Interpretation of data (synthesis) and discussion	
4.1: Design: Clear design goals	
4.2: Design: Detailed design specifications and requirements	
4.4: Design: Design solutions(s)	
4.5: Design: Design implementation/task(s) definition	
4.6: Design: Alternate solution(s) definition	
4.7: Design: Evaluation based on engineering principles	
6.1: Individual and team work: Personal and group time management	
6.2: Individual and team work: Group culture, group dynamics	
6.3: Individual and team work: Leadership: initiative and mentoring, areas of expertise, and interdisciplinary teams	
7.1: Communication skills: Instructions	

7.2: Communication skills: Professional documents: writing, design notes, drawings, attributions, and references	
7.3: Communication skills: Oral and written presentations	
7.4: Communication skills: Technical reading	
7.5: Communication skills: Note-taking skills	
8.4: Professionalism: Knowledge of professional certification requirements	
8.6: Professionalism: Health and safety at work (statutory and other)	
8.8: Professionalism: Code of ethics and protection of public interest	
9.1: Impact of engineering on society and the environment: The place of engineering in society	
9.2: Impact of engineering on society and the environment: Sustainable design; life-cycle planning	
9.3: Impact of engineering on society and the environment: Interactions (engineer with society and stakeholders)	
11.2: Economics and project management: Engineering economics	
11.4: Economics and project management: Risk and change management	
11.5: Economics and project management: Project definition and management techniques	
12.1: Life-long learning: Self-awareness	
12.3: Life-long learning: Information from relevant publications	

Accreditation Units (AUs)

For more information about Accreditation Units, please visit: https://engineerscanada.ca/.

The course has a total of 95 AUs, divided into:

- Complementary Studies: 25%
- Engineering Design: 75%

Instructor and TA contact

Specific to course offering (tbd)

Textbook (or other resources)

Specific to course offering (tbd)

Evaluation and grading scheme

Specific to course offering (tbd)

Breakdown of course requirements

Specific to course offering (tbd)

Tentative week-by-week breakdown

Specific to course offering (tbd)

General regulations

Specific to course offering (tbd)