

Information Session for SYSC-4907 Capstone Project

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Agenda

- SYSC-4907: The Course
- The 4th-Year Capstone Project
- Project Timeline
- Opportunities beyond the Course

What did you know about SYSC-4907?

- **Good?**
- **Challenges?**



- Joy
- Freedom
- Teamwork
- Sky is the limit

The Gist of the 4th-Year Capstone Project

- The apex of your undergraduate studies
- Develop professional-level experience
- Focus on engineering design and process
- Apply all acquired knowledge and skills learned from courses
- A training on the engineering design cycle
- 1.0 credit (two consecutive terms, Fall and Winter)

Project Website

- All information about the project is on the web.
 - <https://sce-soft-web-ist.sce.carleton.ca>
(under SCE Course Materials, Carleton VPN connection required)
 - Project expectations and requirements
 - Project registration and selection
 - Project proposal
 - Notices, FAQ, and Deadlines
 - Read the website before asking questions
 - Some work-in-progress on the new website
 - We will notify you by email if and when the new site is up and running
 - **BrightSpace Course Site**
 - Everything after project registration and selection
 - Announcements
 - Submit project deliverables
 - Receive feedbacks
 - Marking

Systems and Electronics

- **SYSC-4907 Systems Projects**
- **ELEC-4907 Electronics Projects**
- The type of project is determined **by the supervisor**, not by the student
 - Systems Project: Supervised by Systems faculty
 - Electronics Project: Supervised by Electronics faculty
- Free movement of students between the two departments
 - At least if you are in CSE or CE
 - Students in SE and BME: expectation that you do a project with a supervisor in Systems
- **All information in this session is for projects supervised by Systems faculty only.**

Course Registration

- Like any other course, you register via Banner
 - Must **register for both Fall and Winter**
 - If you change projects between departments, make sure you change your registration.
 - Systems project to Electronics project
 - Electronics project to Systems project
 - Incorrect registration causes delays in graduation.

Course Registration

- **Prerequisites:** 4th-year Engineering Year Status and Professional Practice (may be taken concurrently)
- Engineering Year Status != University standing
 - 4th-year Engineering Status : Successful completion of all 2nd-year requirements and 3.5 credits from 3rd-year requirements of program
- In the Systems Department:
 - All prerequisites are enforced.
 - Co-op students may **not** take the project during a work term

The 4th-Year Capstone Project Essentials

- An example of good engineering analysis and design that demonstrates your engineering skills
 - Apply lessons learned from different courses
- **At least 200 hours ... average of 8 hours per week**
- Work under the supervision of 1-2 faculty member(s)
 - Meetings, milestones, applying engineering processes, scheduling and time management, ...
- **The initiative for keeping your project on schedule must come from you**
- Good Engineering also requires communication & documentation

The 4th-Year Project Essentials (cont.)

- It is **NOT** a requirement that you build something that is
 - “innovative”
 - “unique”
- It IS important that you follow a proper engineering approach, **applying, honing, integrating, and extending previously acquired knowledge and skills in a major engineering design project.**
 - There needs to be a clear relationship between your degree program and the project
 - You are to use your previously acquired knowledge and skills
 - This is NOT the place to learn a brand-new set of skills, though you still can do that on your own if they are related to the project.
 - The **process, not just the end product**, you follow needs to be documented and will form a major part of your evaluation.

Group Projects

- Engineering Accreditation requires team experience: **No individual projects allowed.**
- For all deliverables (and in particular for the final report, where it is mandatory):
 - Identify who DID what
 - Identify who WROTE what
- Every student receives an individual final grade
 - Seen quite a range
 - Do not assume that it will be the group grade with a small delta

Project Timeline – Before Fall Term

- **Project selection**
 - When: Anytime between now and mid-September
 - The SYSC-4907 website has a list of project proposals, which will be populated/updated over the next few weeks and months
 - Check regularly
 - First Come First Serve: Projects get full
 - Every student will have a project, but the early birds get the projects/supervisors that they want
- To select and register for a project, **you need an account on the course website**
 - **Apply for an account early**

Selection Process

- **How :**
 1. **Read** the project descriptions on the web
 2. **Talk** to supervisors (email to arrange appointments), better to form a **group** on your own before this step
 - Some projects have prerequisites
 - It's up to you: **Treat it like a job search**
 3. **Agree** with the supervisor, **then**

Project Selection

- Complete the on-line **Project Selection** page
 - Once submitted, the agreement between you and the supervisor is formal:
 - The supervisor will hold a spot for you.
 - An initial group number will be assigned, although group numbers may be changed in late September.
 - The current list of projects will be available online.
 - Projects/Professors that become full will be blocked.
- If you decide to change projects
 - Selection of a second project will not be permitted until you first notify the initial supervisor.
 - Use the online system to drop the project then add the new one.

Propose Your Own Project?

- Definitely!
- **Criteria:**
 - All or most aspects of engineering: requirements, analysis, design, implementation, testing
 - Make use of coursework and go beyond; require independent learning
 - Beyond the integration of existing parts; some parts must be your own creation
- Talk to a professor about the idea and his/her approval for supervision
- Still a group project is needed, i.e., need team members!

Project Timeline – Fall Term

- **Project Selection and Course Registration**
 - Early to mid-September, deadlines on the website
- **Proposal (Mid-late October)**
 - To describe the major objectives and the engineering challenges of the proposed project
 - Driven by project proposal and in discussion with the project supervisor
 - To present an initial plan for the work to be done by each member (timetable)
- **Progress Report (End of Fall Term)**
 - A mid-point checkup on the progress achieved, with reference to the original proposal.
 - A chance to re-define your project, now that you know more.
 - A (refined) plan for the final term
 - Rule of Thumb: All research, requirements & high-level design complete.

Project Timeline – Winter Term

- **Oral Presentations**

- Within a strict fixed 10-minute/person period, you present your work thus far to your supervisor, a 2nd reader, and your peers.
- A visual performance, requiring different skills

- **Poster Fair**

- A poster display will exhibit the final product of your project.
- Visitors will wander about, asking you questions whenever interested. It's a chance for you to showcase your work and even impress some potential employers!

- **Final Report (End of Winter Term):**

- To fully document the engineering of your finished product.
 - Need to cover the process
- Ideal Goal: Allow the use and continuation of your work for a future 4th-year project.
- Major component of your final grade
- Since 2020/21: submit a **3-minute video** showcasing your project

Beside deliverables, during the term

- How much work is expected from me?
 - Rough rule of thumb: **a minimum of 8 hours per week is expected.**
- How can I get a good mark on the project?
 - **A project must contain all engineering elements:** requirements analysis, design, implementation, testing, and documentation.
 - The technical work should reflect the methodologies taught in courses.
 - The best projects show creativity and initiative.
- Bottom Line: The project is your **responsibility**, i.e., self-managed.
 - Supervisors can only remind you, guide you, and provide feedback for improvement.

Grading

- Differ from others: **No fixed percentage breakdown.**
- Key individuals: Supervisor, second reader.
- The final report is the most important factor but
 - each deliverable matters
 - your participation and involvement also factor into the assessment
- We aim to assign the individual as the second reader for the oral presentation, poster, and final report.

The Project Coordinator

- Coordinates departmental events (selection, presentations, poster fair)
- Ensures that all students have a project
- Ensures workload is evenly distributed among faculty
- Last resort for students looking for projects
- Can provide guidance but **is not involved in any project** and does not evaluate any deliverables.
- **Required in all communication: Group number (if you are in a project group already)**
 - **ug-projects@sce.carleton.ca**

Supervisors versus Coordinator

- **Coordinator**

- Looks after overall administration of the projects
- Organizes project-wide events (like information sessions)
- Is a person to help when troubles arise.
- Has no involvement in the project itself (not a co-supervisor)

- **Supervisor**

- Responsible for regular supervision of progress
- Responsible for informing students of all project requirements
- Governs the format of the project deliverables, within the guidelines stated for the project.
- Responsible for providing any resource required by the project
- Responsible for evaluating students and the project deliverables

Opportunities

- **Competitions (samples, not all the time)**
 - IEEE Student Design Competition in late March
 - The IEEE Computer Society International Design Competition
 - The Canadian Appropriate Technologies in Mine Action Competition (CATIMAC)
 - The Ontario Engineering Competition
 - The Canadian Engineering Competition
- **Patents**
- **Departmental Video Competition**
 - We're looking for off-the-shelf demos that we can use in University Open Houses
- **Paper publications in academic conferences**

Project Website

www4.sce.carleton.ca/courses/sysc-4907



With **Freedom** comes ...
Responsibility.

Self-management is key:

- Time management
- Self motivation
- Stress management
 - Adaptability
- Decision making
 - Goal alignment
- Personal development

Engage

*Every aspect,
starting from project selection*