

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING***SE 4450 – SOFTWARE ENGINEERING DESIGN II*****Course Outline 2026-2027****COURSE DESCRIPTION:**

This full-year, fourth-year capstone course represents the culmination of the software engineering undergraduate program. In this comprehensive project-based course, students work in teams to apply and integrate knowledge and skills acquired throughout their prior coursework. Teams will engage in all phases of the software development lifecycle, including the critical activities of software requirements gathering and analysis, object-oriented and system-level design, thorough software testing, robust implementation, and deployment of a functional software product.

Emphasis is placed on the importance of defining precise and verifiable requirements to ensure that project goals align with user needs. Students will produce high-quality design artifacts and iterate through multiple levels of testing to guarantee software reliability and quality. The course experience mirrors professional practice, requiring students to plan, manage, and document their work while collaborating with real or simulated stakeholders. Upon successful completion, students will have demonstrated their ability to deliver a complete software system from concept to deployment, integrating all fundamental aspects of modern software engineering.

ACADEMIC CALENDAR:

https://www.westerncalendar.uwo.ca/Courses.cfm?CourseAcadCalendarID=MAIN_015930_1&SelectedCalendar=Live&ArchiveID=

Design and implementation of a large software engineering project. Design, coding, testing, and implementation are carried out by individual students or project groups under the supervision of a faculty member. Progress reports and a final engineering report are prepared; each student must deliver a public lecture on the work performed.

ANTIREQUISITE(S):

CBE 4497, CEE 4441, ECE 4416, MME 4499, Engineering Science 4499.

PRE OR COREQUISITES:

Prerequisite(s): Completion of third year of the Software Engineering program. Corequisite(s): SE 4452A/B, SE 4455A/B.

Unless you have either the requisites for this course or written special permission from your dean to enroll in it, you will be removed from this course, and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees if you are dropped from a course for failing to have the necessary prerequisites.

CEAB ACADEMIC UNITS:

Engineering Design 100%.

INSTRUCTOR INFORMATION:

Name:

Office:

Email:

CONTACT HOURS:

Timetable information is available at <https://draftmyschedule.uwo.ca/>.

Lectures will not occur every week; be sure to check the course website (OWL Brightspace). Laboratory sessions occur weekly as per the team's schedule.

LECTURE:	
LAB:	

RECOMMENDED/REQUIRED TEXT: NONE

RECOMMENDED/ REQUIRED SOFTWARE: Installed in Software Engineering Labs.

RECOMMENDED RESOURCES/REFERENCES:

- Course notes and supplemental materials are available on the course website (OWL Brightspace).

GENERAL LEARNING OBJECTIVES (CEAB GRADUATE ATTRIBUTES)

Knowledge Base		Use of Engineering Tools	A	Impact on Society and the Environment	
Problem Analysis	A	Individual and Team Work	A	Ethics and Equity	A
Investigation		Communication Skills	A	Economics and Project Management	A
Design	A	Professionalism		Life-Long Learning	A

Notation: x represents the content level code as defined by the CEAB. blank = not applicable; **I = introduced** (introductory); **D = developed** (intermediate) and **A = applied** (advanced).

Rating: **I – The instructor will introduce the topic at the level required. It is not necessary for the student to have seen the material before.** **D – There may be a reminder or review, but the student is expected to have seen and been tested on the material before taking the course.** **A – It is expected that the student can apply the knowledge without prompting (e. g. no review).**

COURSE MATERIALS: Weekly content and guides for the laboratories will be available on the course OWL site. The material for this course will be taught in both lectures and labs; therefore, it is imperative that you attend each lecture and lab.

COURSE TOPICS AND SPECIFIC LEARNING OUTCOMES:

The course topics ensure students develop the skills needed to deliver a large, team-based software project from conception to public presentation, adhering to industry and academic standards.

The following table summarizes the course topics and the learning outcomes along with CEAB GAs where the GAs in bold indicate ones to be measured and reported annually.

COURSE TOPICS AND SPECIFIC LEARNING OUTCOMES	(CAEB) Graduate Attribute
1. Project Initialization and Planning At the end of this section, students will be able to: a. Developing team charter. b. Defining an engineering problem statement and software project proposal. c. Establishing a high-level, preliminary project schedule. (Gantt Chart, Burndown Chart) and estimating the person-power cost. d. Drafting the RACI (Responsible, Accountable, Consulted, and Informed) chart of the project team.	ITW1 PA1 EPM1 EPM2

2. Software Development Model At the end of this section, students will be able to: a. Apply the process of requirements engineering by investigating, defining, and clarifying the project scope, user stories, and sprint backlog. b. Selecting high-level software architecture and formulating the best strategy to achieve the software project's goals. c. Incorporate version control systems (e.g., Git) for managing the changes of the software developing activities. d. Developing a structured approach to delivering software in stages, i.e., incremental release planning (Version 1.0, 2.0, etc.)	I3, D1 PA2 EPM4 D2
3. Prototyping and Technical Feasibility At the end of this section, students will be able to: a. Use of prototypes for requirements gathering and solution exploration. b. Applying incremental and iterative development c. Identifying and applying technology and engineering tools for product development d. Execute detailed sprint planning for the project deliverables.	D3 D4 ET1 PA3
4. Individual and Teamwork At the end of this section, students will be able to: a. Applying methods for tracking individual contributions (e.g., GitHub). b. Applying strategies for effective team collaboration (a rowing crew analogy) c. Assess and reflect on teamwork and individual performance d. Understanding professional ethics and equity in software development (e.g., ACM Code of Ethics) e. Fostering diversity and inclusion through forums and activities	ITW1 ITW2 ITW3 EE1 EE4
5. Communication Skills At the end of this section, students will be able to: a. Follow the instructions for the listening and reading comprehension course guidelines and requirements. b. Deliver effective oral presentations that clearly communicate technical concepts and demonstrations. c. Compose professional reports and retrospectives that communicate information effectively.	CS1 CS2 CS3
6. Lifelong Learning and Retrospective At the end of this section, students will be able to: a. Evaluate project outcomes to derive lessons learned and recommend improvements. b. Assess personal knowledge and skills to identify gaps and develop a plan for further learning.	LL1 LL2

EVALUATION AND COURSEWORKS SCHEDULE:

Activity name	% Worth	Due date	CEAB GAs ASSESSED
Team charter & project selection	2%		ITW1
Project workbook & project inception	10%		PA1, EPM1, EPM2, I3
Iteration planning & individual checks-in	5%		I3, D1, EPM2
Concept Design Presentations	10%		PA2, ET1, D1
Live demo 1 with Faculty Advisor (demonstrating minimal, end-to-end features of the software product)	15%		D2, D3, PA3, ET1, ITW2
Retrospective (Demo 1 feedback and action items)	5%		CS3, LL1, LL2
Live demo 2 with Faculty Advisor (demonstrating a potentially releasable software product)	15%		D2, D3, PA3, ET1, ITW2
Design day presentation	10%		CS2
Final Prototyping and final design documentations	15%		CS3, LL1, LL2
Retrospective (Reflections and Lessons Learned)	5%		CS3, LL1, LL2
Participation and professionalism (including lecture attendance)	8%		ITW3, EE1, EE4

Note that the dates listed above are **tentative** and may be adjusted if needed.

COURSE POLICIES:

- The Design Day presentation will be scheduled at a time and location suitable for all capstone projects in software engineering, mechatronics systems engineering, electrical engineering, and mechanical engineering programs to be presented at the same time and in the same venue. The Design Day event is a designated assessment; therefore, participation is mandatory unless the student has approved academic accommodations.
- To pass this course, students need to achieve a final grade of at least 50%. The deliveries on the table above are subject to adjustments and changes as needed. These deliverables are assigned to teams except for the team charter, individual checks-in, participation, and professionalism, which are individual marks. 50% is needed to pass the participation and professionalism portion of the deliverables above. Failure to meet this threshold means that the student fails the course.
- Students who have failed the course must repeat all course components. No special permissions will be granted enabling a student to retain evaluation marks from previous years. The student cannot resubmit previously completed evaluations for grading in subsequent years.
- Marks will be assigned based on method of analysis and presentation, correctness of solution, clarity, and neatness.
- Design teams will be formed around approved project topics to be determined early in the course.
- Individuals who do not join a project group by the team charter due date will forfeit the marks allotted for this task and will be assigned to a group at the discretion of the course instructor. The course instructor reserves the right to assign students to groups and projects as appropriate.
- While the default assumption for team submissions is that all team members have contributed equally and hence they should receive identical marks for team deliverables, the project advisor can discretionarily adjust the marks depending on individual contributions brought to the team effort.
- If the project advisor thinks that the assessment and progress are not meeting expectations for a long time,

the project may be terminated right away and the course failed.

- All team members are expected to contribute equally to the team's efforts. Project advisors will check these contributions from time to time, and team members will be held responsible for what they do. Therefore, if the faculty advisor thinks that different group members aren't contributing equally to the project deliverables, each member's contributions will be updated weekly, and each member will be given the appropriate grade. If a student keeps not contributing enough to the team, the project advisor may have to remove them, which could mean failing the course.
- Students are responsible for checking their Western email and notices posted on OWL/Brightspace (<http://owl.uwo.ca>) for news and updates. This is the primary method for disseminating information to all students in the class.

TEAMWORK: Software project teams can be formed by 4, and only 4, members. No exceptions from this rule will be allowed. Team members will be required to present their software development outcomes and the related design reports at various times during the year, with all team members expected to present their work.

ATTENDANCE: Attendance in lectures is mandatory and will contribute towards the participation and teamwork grade.

LATE SUBMISSION POLICY: This course employs flexible deadlines for the group project assignments. The assignment deadlines can be found above in the course outline. For each assignment, teams are expected to submit the assignment by the deadline listed. Should illness or extenuating circumstances arise, they are permitted to submit their assignment up to 48 hours past the deadline without academic penalty. Should a team submit their assessment beyond 48 hours past the deadline but less than 72 hours, a late penalty of 50% will be subtracted from the assessed grade. No submissions will be accepted after 72 hours from the listed deadline, and the homework assignment will be marked as zero. **As flexible deadlines are used in this course, requests for academic consideration will not be granted.** If you have a long-term academic consideration or an accommodation for disability that allows greater flexibility than provided here, please reach out to your instructor at least one week prior to the posted deadline.

CLASSROOM CONDUCT: The instructor is committed to providing a respectable learning environment for all students involved in this course. There is a shared responsibility here between the instructor and the students, so all students in this course agree to follow these rules:

- Please arrive at class on time.
- Keep in mind the different cultural and linguistic backgrounds of the students in the course.
- Treat the teacher, your classmates, and the authors whose work you are talking about with respect.
- Show respect for the different points of view you will hear in class and in your readings. The exchange of diverse ideas and opinions is part of the scholarly environment.
- Be professional and scholarly in all course activities. Remember to properly cite other people's ideas.
- Any kind of disruptive behavior in class is not allowed. Students engaging in disruptive behavior may be subject to disciplinary measures under the Code of Student Conduct.

FACULTY OF ENGINEERING POLICIES:

Students must familiarize themselves with the policies of the Faculty of Engineering

<https://www.eng.uwo.ca/electrical/pdf/2025-UG-Policy-and-Procedures.pdf>

FACULTY OF ENGINEERING POLICIES AND PROCEDURES-UNDERGRADUATE:

Absence/Late Accommodation Policy

Students must familiarize themselves with the University Policy on Academic Consideration – Undergraduate Students in First Entry Programs posted on the Academic Calendar:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf

This policy does not apply to requests for Academic Consideration submitted for attempted or completed work, whether online or in person. The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

Students missing a test/assignment/lab or examination will report the absence by submitting Academic Consideration Request form through [STUDENT ABSENCE PORTAL](#).

- All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline. Academic consideration may include extension of deadlines, waiver of attendance requirements for classes/labs/tutorials, or re-weighting of course requirements.
- An instructor may deny academic consideration for any assessment that is not required in the calculation of the final grade (e.g., "8 of 10 quizzes"). Assessment flexibility must be indicated on the course outline.
- An instructor may deny academic consideration relating to the timeframe submission of work where there is already flexibility in the submission timeframe (e.g., 72-hour submission window). This assessment flexibility must be indicated on the course outline.
- All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request without supporting documentation per course. Some assessments are excluded from this policy. Please refer to the course outline to determine if documentation is required.
- Requests without supporting documentation are limited to one per term per course.
- Please note that examinations scheduled during official examination periods always require official supporting documentation.
- If a student mistakenly submits their one allowed Academic Consideration request without supporting documentation for the assessments listed above that do not require academic consideration, the request cannot be recalled and reapplied. This privilege is forfeited.

An undocumented absence is only valid for a 24-hour period, from midnight on the day specified to midnight of the following day. An appropriate use of an undocumented absence would be for an in-class assessment that takes place that day. Where the time given to complete the assessment is longer than 24 hours, an undocumented absence will not cover a student for the full time given to complete the assessment, and flexibility considerations in submitting the assessment will override the undocumented absence.

NOTE: Forged notes and certificates will be dealt with severely. To submit a forged document is a scholastic offence (see below).

It is the student's responsibility to check the date, time and location of the [Special Examination](#).

Religious Accommodation

When scheduling unavoidably conflicts with religious holidays, which (a) require an absence from the University or (b) prohibit or require certain activities (i.e., activities that would make it impossible for the student to satisfy the academic requirements scheduled on the day(s) involved), no student will be penalized for absence because of religious reasons, and alternative means will be sought for satisfying the academic requirements involved. If a suitable arrangement cannot be worked out between the student and instructor involved, they should consult the appropriate Department Chair and, if necessary, the student's Dean.

It is the responsibility of such students to inform themselves concerning the work done in classes from which they are absent and to take appropriate action.

Academic Integrity

In the Faculty of Engineering, we encourage students to create a culture of honesty, trust, fairness, respect, responsibility, and courage, befitting the professional degree you are pursuing.

Please visit [Academic Integrity Western Engineering](#) for more information.

Academic Offences

Plagiarism means using another's work without giving credit. The university has rules against plagiarism and other scholastic offences. Western Engineering has a zero-tolerance policy on plagiarism. The minimum penalty is zero on the course work and a repeat offence will earn you zero on the course. A third offence may lead to expulsion from the university.

[Scholastic Discipline for Undergraduate Students & Cheating, Plagiarism and Unauthorized Collaboration: What Students Need to Know](#)

Students must write their reports, essays and assignments in their own words. Whenever students take an idea or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. University policy states that cheating, including plagiarism, is a scholastic offence. The commission of a scholastic offence is attended by academic penalties, which might include expulsion from the program. If you are caught cheating, there will be no second warning.

All required papers may be subject to submission for textual similarity review to commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents on the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between the University of Western Ontario and Turnitin.com (<http://www.turnitin.com>). Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, in the relevant section of the Academic Handbook:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

Faculty of Engineering AI Policy

The use of generative Artificial intelligence (GenAI) tools won't be discouraged in the Faculty of Engineering. As we pride ourselves on building the future we can't hide from the use of GenAI tools to contribute to the understanding of the course materials. Please refer to the course outline for the GenAI policy related to each course.

GenAI tools use won't be permitted in any type of examination or other assessments where the faculty have prohibited their use. If use of GenAI tools is detected by the instructor in these instances, academic offences penalties might be imposed against the student.

Accessibility

Western is committed to achieving barrier free accessibility for persons with disabilities studying, visiting and working at Western. As part of this commitment, there are a variety of services, groups and committees on campus devoted to promoting accessibility and to ensuring that individuals have equitable access to services and facilities. To help provide the best experience to all members of the campus community, please visit the [Accessibility Western University](#) for information on accessibility-related resources available at Western.

Students with disabilities may arrange for academic accommodation at Western. For a more detailed explanation, please visit [Academic Support & Engagement -Academic Accommodation.](#)

Inclusivity, Diversity, and Respect

The Faculty of Engineering at Western University is committed to creating equitable and inclusive learning environments that value diverse perspectives and experiences. We recognize that university courses often marginalize students based on social identity characteristics such as, but not limited to, Indigeneity, race, ethnicity, nationality, ability, gender identity, gender expression, sexuality, age, language, religion, and socioeconomic status.

Understanding this, we strive to facilitate equitable experiences and inclusion within the classroom by respecting and integrating multiple ways of knowing, being, and doing. Please visit the [Office of Equity, Diversity and Inclusion](#).

Health and Well-Being

[Health & Wellness Services – Students](#) - Offers appointment-based medical clinic for all registered part-time and full-time students.

[Mental Health Support](#) - Provides professional and confidential services, free of charge, to students needing assistance to meet their personal, social and academic goals. Services include consultation, referral, groups and workshops, as well as brief, change-oriented psychotherapy.

[Crisis Support](#) - For immediate assistance, please visit Thames Hall Room 2170 or call 519-661-3030. The crisis clinic operates between 11:00 am - 4:30 pm. For after-hours crisis support, click [here](#).

[Gender-Based Violence and Survivor Support](#) - “Western is committed to reducing incidents of gender-based and sexual violence (GBSV) and providing compassionate support to anyone who is going through or has gone through these traumatic events. If you are experiencing or have experienced GBSV (either recently or in the past), you will find information about support services for survivors, including emergency contacts at the following website: https://www.uwo.ca/health/student_support/survivor_support/gethelp.html To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Important Contacts

[Engineering Undergraduate Services](#)

[Department of Electrical and Computer Engineering](#)

[Office of the Registrar/Student Central](#)

Important Links

- [WESTERN ACADEMIC CALENDAR](#)
- [ACADEMIC RIGHTS AND RESPONSIBILITIES](#)
- [ENGINEERING PROGRESSION REQUIREMENTS AND ACADEMIC REGULATIONS](#)
- [UNIVERSITY STUDENTS’ COUNCIL \(USC\) - SERVICES](#)
- [IMPORTANT DATES AND DEADLINES](#)
- [ACADEMIC CONSIDERATION FOR MEDICAL ILLNESS - UNDERGRADUATE STUDENTS](#)
- [ACCOMMODATIONS FOR RELIGIOUS HOLIDAYS](#)
- [SCHEDULING OF ASSIGNMENTS, TESTS, AND EXAMINATIONS](#)
- [STUDENT FORMS](#)
- [OFFICE OF THE REGISTRAR](#)
- [RETENTION OF ELECTRONIC VERSION OF COURSE OUTLINES \(SYLLABI\)](#)

- [ACADEMIC APPEALS](#)
- [STUDENT ABSENCE PORTAL](#)