Western Engineering

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEEING

AISE 2251 – Software Design for Systems Engineering

COURSE DESCRIPTION:

AISE 2251 is a group project illustrating the design and implementation the software engineering design concepts. It covers the integration with third-party applications and big data sources. Real-time and distributed systems, architectural design will be briefly covered.

ACADEMIC CALENDAR:

https://www.westerncalendar.uwo.ca/Courses.cfm?CourseAcadCalendarID=MAIN_030972_1&SelectedCalendar=Live&ArchiveID=

PRE OR COREQUISITES:

> **Prerequisites:** Engineering Science 1036A/B or Computer Science 1026A/B, Software Engineering 2205A/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.

ANTIREQUISITES:

> **Antirequisite:** SE 2203A/B, Computer Science 2212A/B/Y

CEAB ACADEMIC UNITS: Engineering Science 25%, Engineering Design 75%.

CONTACT HOURS:

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

LECTURE:	Three hours weekly
LAB:	Three hours weekly

RECOMMENDED TEXT:

Paul Deitel and Harvey M. Deitel, *"Intro to Python for Computer Science and Data Science: Learning to Program with AI, Big Data and The Cloud"*, Pearson,1st edition, 2019, ASIN:B089N35YXY. https://www.amazon.ca/Intro-Python-Computer-Science-Data/dp/0135404673 Cost: $225.00

GENERAL LEARNING OBJECTIVES (CEAB GRADUATE ATTRIBUTES)

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

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.

COURSE TOPICS AND SPECIFIC LEARNING OUTCOMES:

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

Course Topics and Specific Learning Outcomes	**CEAB GA Indicators**
1. Introduction to Python	KB4, ET2
At the end of this section, students will be able to: **a.** Recognize Python as a programing language. **b.** Recognize and use different development environments for Python. **c.** Recognize and use main programing constructs in Python. **d.** Recognize and utilize Python libraries popular for ML and data science.	
2. Data Engineering Fundamentals	KB4, ET2, D4
At the end of this section, students will be able to: **a.** Recognize and connect to various data sources. **b.** Recognize and work with popular data formats. **c.** Pass data between different databases and/or services. **d.** Distinguish between batch processing and stream processing.	

4.	**Software Design Principles**	KB4, D3, D4
	At the end of this section, students will be able to: **a.** Recognize the software development life cycle. **b.** Recognize and implement distributed systems designs. **c.** Read and create UML models. **d.** Recognize and implement OOP design principles. **e.** Refactor poorly designed code to enhance it.	
5.	**Collaborating in a group project**	ITW1, ITW2
	At the end of this section, students will be able to: a. Contribute responsibly to a teamwork. b. Evaluate the performance of self and teammate. c. Implement a software system from end-to-end.	

EVALUATION:

Course Component	Weight
Project	50%
Review Questions	5%
In class activities	5%
Laboratory	20%
Midterm Test	20%

COURSE POLICIES:

- Evaluation items with a weight less than or equal to 5% **will not be accommodated**.
- The rest of the assignments will be acceptable 72 hours after the due date without penalty to accommodate for any potential emergencies. Accommodations needed for more than 72 hours will require supporting documentation.
    - **Please do not treat the 72-hour flexibility period as an automatic extension to the deadline. Only use it for emergencies; otherwise, you may risk losing the grade of that assignment, as emergencies that occur after the due date will not be considered accommodations.**
    - Please note that because the submission deadline for this assessment already includes flexibility the instructor reserves the right to deny academic consideration for assignments which are submitted following the end of the period of flexibility.
- Students Seeking academic consideration for the midterm exam will be required to provide formal supporting documentation. A Make-up exam will be scheduled for students after they're granted academic consideration.
- Accommodations are granted for individual students, not for groups. If one group member was granted accommodation, the rest of the group is still required to submit

partial work on the due date, stating the responsibilities of each group member and missing only the work of the accommodated student, with the possibility of submitting an amendment to include the accommodated student's work according to their accommodation. Consult with the instructor if you're in doubt regarding your group assignments before the due date to clarify what's required in your case.

- **In order to pass the course a student is required to have at least 50% in each of the evaluation categories with weight >= 10%, otherwise the student will receive a final grade of 48%.**
- **Each student must contribute significantly to the development of the project as demonstrated by their contributions in the project's repo on GitHub according to qualitative judgement by the instructor. Failure to contribute accordingly will result to a final grade of 48% or less. Fake or deceptive commits or any attempt to manipulate the the repo will be considered a violation to academic integrity and will be reported to the dean's office.**