## **SWEN 360L: Software Design and Engineering Laboratory (1 credit)**

This laboratory-based course provides students with practical experience in applying software engineering principles and techniques to real-world scenarios. Students will work individually and in teams to engage in various software engineering activities, including requirements analysis, design, implementation, testing, and maintenance of software systems. Through a series of guided projects and exercises, students will develop skills in problem-solving, critical thinking, and effective collaboration within a software engineering context. This laboratory course serves as a valuable opportunity for students to gain practical insights into the application of software engineering concepts and refine their skills in building reliable and maintainable software products. *(Corequisite: SWEN 360)*

**Course Learning Outcomes:**

By the end of the course, students will be able to:

A1. Apply software design principles to practical, hands-on exercises and projects.

A2. Effectively use industry-standard software and tools for modelling and designing software solutions.

B1. Develop software prototypes facilitating the translation of design concepts into functional solutions during projects.

B2. Effectively communicate the functionality of developed software solutions to both technical and non-technical audiences.

C1. Collaborate effectively in a team environment during software projects development.

C2. Address ethical principles in software design and engineering decision-making processes.

**Course Learning Materials:**

* Sommerville, I. (2015). Software engineering 10th edition.
* Pressman, R. S. (2005). Software engineering: a practitioner's approach. Palgrave macmillan.
* Pfleeger, S. L., & Atlee, J. M. (1998). Software engineering: theory and practice. Pearson Education India.
* Lethbridge, T. C., & Laganière, R. Object Oriented Software Engineering: Practical Software Development Using UML and Java, 2004.

**Course Content:**

1. Lab 0: Introduction to Case Studies + Brainstorm Mind maps
2. Lab 1: Introduction to Project Brief + Brainstorm Mind Maps + Ishikawa Diagrams
3. Lab2: Getting started with Azure DevOps
4. Lab 3: Journey Maps + Interviews
5. Lab 4: Setting up Azure DevOps Wiki + SRS
6. Lab 5: Data Flow Diagram + Data Dictionary
7. Lab 6: UML Use Case Models
8. Lab 7: UML Sequence Diagrams
9. Lab 8: UML Class Diagrams
10. Lab 9: UI/UX (Navigation and MockUps)
11. Lab 10: Introduction to GitHub
12. Lab 11: Testing Plan
13. Lab 12: Build applications with Azure DevOps (Pipeline)