CSE344: SOFWARE ENGINEERING
YEDITEPE UNIVERSITY
Instructor: Doç.Dr. Mert Ozkaya

SPRING 2023 TERM PROJECT

This semester you are required to undertake a software project in collaboration with the undergraduate students from the Department of Industrial Engineering (ISE) who is taking ISE 402 System Design course.

You are required to work as a group of 5-6 CSE students and work collaboratively with a group from ISE402. While the goal of the CSE group is to define the problem, analyse the problem and specify the requirements, design the system, and implement & test the system as designed, the goal of the ISE group is to define and analyse the problem. So, the two groups are required to work together in defining the problem to be focused in their project, and analysing the problem to better understand its parts and requirements, documenting the problem and its solution using a well-understood format (i.e., UML and acceptable document outline). Note that the problem focused needs to be confirmed by each group.

In this course, you are essentially expected to gain the theoretical and practical knowledge of analyzing, specifying, and designing a software system before starting with the implementation (coding). So, each CSE team is supposed to prepare and submit (as a group) an analysis report first then develop a prototype tool that satisfies the requirements. Note here that the analysis report is to be prepared together with the ISE group and each statement given in the analysis report must be agreed by both group members. After submitting the analysis report and demonstrating your prototype tool, you are expected to submit a design report during the term. The report submissions need to be made as a softcopy (via YULEARN). Note also that each CSE team is expected to implement your software system in the way you specified and designed.

Analysis report (Deadline: March 31st, 2023) comprises the requirements specification, which is the first stage of developing a software system. The requirements specification can be considered as the agreement between you and your customer. In the requirement specification, each CSE team is expected to describe your software system that is intended to solve the customer's problem. It basically includes the functionality of the system (i.e., what the software does and does not), the system's interaction with the users, quality requirements, and design constraints.

1. Introduction
    1. Purpose - *describe in short what this document serves for*
    2. Background - *give information about the domain*
    3. Motivation
        1. Statement of problems with the existing system
        2. The new system - *describe here the features of your new system by showing how they solve the problems*
    4. Structure of the document
2. Functional requirements
    1. Description of the system functionalities
    2. Description of the system users
    3. Specific Requirements

1. Use Case Diagram
2. Use Case Priority List
3. Use Case Specifications
3. Non-functional requirements
1. Volere Template
4. System models
1. Object and class model
2. User interface - navigational paths and screen mock-ups
5. Definitions, Acronyms and Abbreviations
6. Glossary & references

Prototype Software Tool Development (Deadline: April 17th, 2023) is the second stage where you are expected to develop a prototype software that includes the graphical user interfaces regarding all the functional requirements and can be executed successfully. The prototype software tool is expected to support all the user interfaces agreed with the ISE group.

Note that the prototype tool does not have to include the business logic (i.e., the implementation of the functional requirements) and should rather focus on the user-interface aspect of the system. The business logic is expected to be implemented in accordance with the software design.

Each prototype tool will be demonstrated to the course TA (*To be announced*) during the date and time interval to be announced and you will get your grade.

Software design (Deadline: May 24th, 2023) is the third stage in software development, which follows the requirements specification. In the software design report, each CSE team is expected to describe the structure of your software system that meets the requirements specified in the analysis report. The design report must clearly describe the components of your software system and their relationships. You must also describe all necessary information about these components so that programmers can use your design to implement the software system.

A good structure for a design report can be as follows:
1. Introduction
    1. Purpose of the document - what is this document for?
    2. Purpose of the system - what is your proposed system for?
        1. Describe your proposed new system in terms of its users and the features provided to the users.
    3. Structure of the document
2. Detailed design class diagram (Refined and corrected form of the analysis class diagram)
    1. You must provide a much more detailed class diagram here
        1. Detailed classes (attributes and methods)
        2. Detailed Relationships (associations, compositions, aggregations, relationship names, and multiplicities)
3. Dynamic models
    1. Sequence Diagrams
    2. State Diagrams
    3. Activity Diagrams
4. Software architecture
    1. UML Package Diagram
    2. UML Component Diagram
5. Entity Relationship Diagram
6. Glossary & references

Software implementation (Deadline: 29ᵗʰ May, 2023) is the fourth stage in which each CSE team is supposed to implement the computer game you have designed in the previous stage. You can use any object-oriented programming languages to implement your system, e.g., Java, C++, and C#. The implementation code for each CSE team is to be submitted online via YULEARN.

You should keep reports of every phase of your project. You should track your team members and assign work via Trello (trello.com online collaboration tool). Your project development phases should follow your initial project plan (Gantt chart) and if you have diverted from your initial time line, you should justify it in your project's final implementation report.

The meeting minutes submission (Deadline 1ˢᵗ June, 2023) is the final stage of the project where you are supposed to submit 13 different meeting minutes. **ISE Collaboration** is the essential part of the course. Each CSE team needs to have a meeting with the corresponding ISE team on a weekly basis. After each meeting, you are supposed to submit a meeting minutes report that includes what have been discussed in the meeting and who have attended the meeting. It is mandatory that each member of each group is ready at the meeting. If you have any valid reasons to not to attend any meeting, you need to let TA (To be announced) know. **The meeting minutes report for a week must include the signatures of each team members. In case you prefer to meet online, you must put a picture of the meeting session that clearly indicates the members attended.** The meeting minutes will be evaluated and graded – its weight is 10% of the overall course grade.