CS 130: Software Engineering, Fall 2024

Teaching Team

Instructor: **Prof. Maged Elaasar** (**melaasar@g.ucla.edu**)
Lecture: MW 6 PM to 7:50 PM (MS 4000A)
Office hours: MW 5-6 PM (BH 3531A)

TA: **Burak Yetistiren** (**burak@cs.ucla.edu**)
<mark>Discussion 1B & 1C: TBD</mark>
<mark>Office hours: TBD</mark>

TA: **Om Ravishankar** (**omamitesh@g.ucla.edu**)
<mark>Discussion 1A: TBD</mark>
<mark>Office hours: TBD</mark>

Course Description

This course is at the intersection of computer science and engineering. It provides both theory and hands-on experience with the development of large-scale software systems. You will learn systematic methods for large-scale software development including: agile process, software analysis, architecture patterns, design patterns, code generation, unit testing, regression testing, bug finding, code refactoring, and DevOps. You will get to practice these methods in the context of a software project developed in collaboration with other students. However, this course will not focus on coding; and students are expected to already have basic knowledge of Java, which will be used for basic coding exercises and to demonstrate coding examples.

Course Survey

In the first lecture, I will ask you to fill out a background survey on your background and what you are hoping to learn. In the second lecture, I will discuss how your expectations are aligned with and/or different from what is to be covered and emphasized in the course.

Grades

Participation: 3%
Homework: 12%
Project: 35%
Midterm: 25%
Final: 25%

Class Schedule

Week	Day	Date	Topic	Notes
00	F	*9/27*	**CANCELED**	
01	M	9/30	Introduction to Software Engineering	
	W	10/2	Software Process (Process Models, Scrum Process)	
	F	10/4	Discussion Session (TA) (Project kick-off & overview)	**Project Part A release**
02	M	10/7	Software Analysis 1 (UML Diagrams: Basics)	**HW 1 release**
	W	10/9	Software Analysis 2 (UML Diagrams: Digging Deeper)	
	F	10/11	Discussion Session (TA)	**Project Part A due** **Project Part B release**
03	M	10/14	Software Architecture 1 (Architectural Patterns)	
	W	10/16	Software Architecture 2 (Cloud Architectures)	
	F	10/18	Discussion Session (TA)	
04	M	10/21	Software Design 1 (Creational/Structural Patterns)	
	W	10/23	Software Design 2 (Structural/Behavioral Patterns)	
	F	10/25	Discussion Session (TA)	
05	M	10/28	Software Design 3 (Behavioral Patterns)	
	W	10/30	Software DevOps (CI/CD/CM) (Midterm review)	**HW 1 due**
	F	11/1	Discussion Session (TA) (Midterm review)	

06	M	11/4	**Midterm Exam**	**6pm - 7:50pm (MS 4000A)**
	W	11/6	Software Code Generation (Abstraction, Automation)	**Bonus HW release**
	F	11/8	Discussion Session (TA)	**Project Part B due** **Project Part C release** **Project Part D release**
07	M	11/11	**VETERANS DAY HOLIDAY**	
	W	11/13	Software Testing 1 (coverage criteria, white box test, unit test)	**HW 2 release**
	F	11/15	Discussion Session (TA)	
08	M	11/18	Software Testing 2 (symbolic execution, regression test)	
	W	11/20	Software Code Review (Hoare Logic)	
	F	11/22	Discussion Session (TA)	**Bonus HW due**
09	M	11/25	**Special Topic (TBD)**	
	W	11/27	Software Evolution & Maintenance (Anti-Patterns, Refactoring) (Final review)	
	F	11/29	**THANKSGIVING HOLIDAY**	
10	M	12/2	**Final Project Presentations (on Zoom)**	**Project Part D due**
	W	12/4		**HW 2 due**
	F	12/6	Discussion Session (TA) (Final review)	**Project Part C due**
11	T	**12/9**	**Final Exam**	**6:30pm - 9:30pm (Location: TBD)**

Participation

You are expected to attend and participate in all lecture and discussion sessions of this class. Participation will be measured by answering quizzes posted during class. You will be allowed to miss up to 20% of the quizzes. This should allow you to address circumstances like being sick,

having schedule conflicts, etc. without losing marks. So, plan accordingly, and do not ask your instructor or TA for make ups.

Homework

You will be given homeworks in this class with questions that are representative of those on tests. Homework is individual (**not team**) effort. When released, we may not have covered all the topics on it yet. This means you will work on them incrementally until the due date. *Late submission may be allowed (for 1 or 2 extra days) with a penalty*.

Exams

You will write two exams in this class. The first is a **Midterm** that is given around mid quarter. The second is a **Final** that is given in the finals week.Final will not include Midterm topics (except where noted). Exams are always an individual (not team) effort (zero tolerance for any kind of collaboration).

Project

You will practice the software engineering process and methods that you learn in class to develop a software application as an open-source project on GitHub. The project will be carried by a team of approximately 5 students (you will form such a team in the first week). Teams can only be formed by students in the same discussion section.

You will have the opportunity to propose your own unique app idea that can be developed in 8 weeks. You will have the freedom to choose a programming language and a technology stack to realize your app. Hence, it would be prudent to choose ones that team members already have some expertise with or can manage to learn within this timeframe.

You are expected to showcase your project work incrementally over time through a set of deliverables (shown below). You will also be asked to present those deliverables, as well as provide constructive feedback on other teams' deliverables.

Your TA will be in charge of setting expectations for and grading your project deliverables. The focus will be on the quality of following the (scrum) development process, using best practices taught in class, justifying/communicating your decisions, challenging yourself, and the quality of the final product. Students in the same team may not always receive the same grade, as TA will consider your individual contribution/effort and your teammates' feedback when giving individual grades. Such feedback will be collected a few times throughout the quarter and may result in a penalty (up to -**10%** of the overall course grade) for lack of collaboration.

Project deliverables (35%):
- Part A: Application Concept, Milestones, Feasibility, and Technology Stack (**3%**)

- Part B: Application Analysis, Architecture and Design Descriptions (**14%**)
- Part C: Application Implementation, Testing, and Deployment (**12%**)
- Part D: Application Demonstration (Youtube video) and Project Retrospective (**6%**)

Discussion

A discussion session will typically be divided into two parts. In the first part, the TA will review/reinforce the lecture material. In the second part, you will meet with your team members to discuss the project (scrum meeting) and/or with the TA to get feedback.

Platforms

We will be using **BruinLearn** as the main platform for posting the lecture and discussion material and making announcements so make sure to check it regularly. We will be using **Gradescope** for homework, the group project, and midterm + final exams. We will also be using the **Piazza** platform for discussions, Q/A and announcements. Finally, we will be using **Google Forms** (or other platforms) for class quizzes and surveys.

Feedback

At some points, we will be asking you to give feedback on your learning experience using anonymous surveys. It is very important for us to know your reaction to what we are doing in the class, so I encourage you to respond to the surveys, to help us create an environment that is effective for teaching and learning.

Academic Integrity

Each student is expected to uphold the values of integrity, honesty, trust, fairness, and respect toward peers and community. Violations (e.g., cheating, unpermitted collaboration or use of resources) will absolutely NOT be tolerated. In your first week, you must read and sign UCLA's **Academic Integrity Statement** and submit it through Gradescope. It will be homework 0.

Other Policies

- If you want to switch your discussion class (e.g., to be with your teammates), work this out with the CS department. The instructor will not interfere with this process.
- The instructor will not give out PTEs for attending this class. Please work out registration with the CS department.
- The instructor cannot accommodate individual requests to schedule the Midterm or Final exam on different dates.
- Grades for individual components will not be curved. However, the final grade may get curved before letter grades are assigned.