CS 130 Hub

UCLA CS 130: Software Engineering (Spring 2023)

TABLE OF CONTENTS

Course description

Principles relevant to creating large-scale software projects as opposed to small one-person efforts. The class emphasizes scalable software engineering practices, teamwork, processes, and tools. The core of this class is a team project to implement and deploy a web server in C++.

Important links

Code Review (Git/Gerrit):	https://code.cs130.org
Piazza discussions:	https://piazza.com/ucla/spring2023/cs130
E-mail instructors:	ucla-cs130-admin@googlegroups.com

Instructors

Michael Burns:	mbx@g.ucla.edu
Alex Monroe:	alexrmonroe@gmail.com
Philo Juang:	pjuang@google.com

Lectures

Class:	Mondays and Wednesdays 6pm - 7:50pm Franz Hall Room 1178
Office hours:	Book on calendar or e-mail instructors to schedule.

Discussions / TAs

TA:	Apoorv Garg «apoorvgarg17@g.ucla.edu»
TA:	Arvind Vepa «arvind.m.vepa@gmail.com»
TA:	Fabrice Harel-Canada «FabriceYHC@gmail.com»
TA:	Steven Gong «nikepupu9@gmail.com»

Prerequisites

- CS111: Operating Systems
- CS131: Programming Languages
- (Suggested) CS118: Networking

Textbook and Readings

- (Suggested) Kernighan and Pike, The Practice of Programming
- Additional readings on the web

Class project

During this course you will join a team of other students and complete a project in which you will jointly develop a configurable, scalable server and deploy it for public access on Google Cloud with appropriate logging and monitoring. The goal of this is to learn and practice sound development practices including thoughtful API design, maintainable coding style, automated testing, and peer code review.

Assignments will be posted on this website each Monday after noon for specific milestones of the project, and will be due the following Monday morning by 11:59PM, submitted via online form. Students will be graded on their individual contributions for each assignment, as well as the health of the project and the functionality of the server.

Assignment topics include:

- Repository setup, Unit tests, Code reviews (individual assignment)
- Simple echo server, Deployment
- Continuous build, Test coverage, Web server testing
- Serving static files
- API proposal and presentation (no late work accepted)
- Refactoring
- Reverse proxy, Threading
- Self and peer evaluations (individual assignment)

Exams

Exam questions will be drawn from lectures, readings, and assignments. Exam structure is TBD due to remote teaching.

Grading

Course grade breakdown:

Assignments:	70%
Midterm:	15%
Final:	15%

Work and exams will be graded on an absolute scale.

A curve may be applied, but only to students’ benefit (your grade will never decrease as a result of a curve)

Academic Honesty

For exams, presentations, and written work (other than code), normal standards of academic honesty apply, as outlined in the UCLA Student Conduct Code.

For computer code, reading and adapting publically available code is encouraged, and in some cases may be necessary. You must cite your source in a comment, in the form of a URL.

Class Schedule

Date	Lecture	Topics	Reading
April 3	1	Course overview Development environments Source control	
April 5	2	Testing	
April 10	3	Code Reviews Tools for web server development	
April 12	4	Build systems Deployment	
April 17	5	Testing, refactoring, and debugging a web server	
April 19	6	Testability Integration testing Mocks Dependency Injection	
April 24	7	Static analysis Instructor Q&A	
April 26	8	Logging and exception handling	
May 1	9	APIs	
May 3	-	**Midterm**	
May 8	10	Class API standardization	
May 10	11	Writing Readable Code	

Date	Lecture	Topics	Reading
May 15	12	Threading, Refactoring	
May 17	13	Web server & Distributed system architecture Anti-patterns	
May 22	14	Performance Capacity planning Profiling	
May 24	15	Invariant testing Monitoring	
May 31	16	**Memorial Day**	
May 31	17	Documentation Team structure Postmortems	
May 31	18	Team presentations	
June 2	19	Team presentations	
June 10	-	**Final, 8am - 11am**	

“You may think using Google’s great, but I still think it’s terrible.” —Larry Page

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