2024 CS 5356 - Syllabus

Course Title: Building Startup Systems, Spring 2024

Department, Course Number, Section: CS 5356

Meeting Time(s) and Locations: Mon, Wed 2:55pm - 4:10pm

Office Hours: https://calendly.com/da335/office-hours?month=2024-01

Slack channel: #2024-cs5356-chats

Instructor:

Danny Aslam-Perez (he/him)
Director of Engineering @ Heggerty
da335@cornell.edu

Prerequisites:

- Familiar with at least one programming language (javascript/node, python, java)
- Knowledge of HTML/CSS

Communications:

- Preferred way to communicate with myself and with the rest of the class will be via dedicated Slack channel
- You can join my office hours over Zoom, or in-person after class
- Announcements and updates will be shared on Slack & Canvas

Course Description:

This course aims to bridge the gap between academic studies of computer science and production software engineering. The course provides a fast-paced introduction to key tools and techniques that can facilitate the building of prototypes and of actual working systems. It introduces technologies for building Web applications and mobile applications, systems for effective storage of data, and tools that support and ease code writing, such as distributed version-control systems, editors and debuggers.

Over the course of the semester, we’ll work on 3-4 different web-based systems and use modern tools & techniques to build them. This class is less about building web systems, and more about the workflow to build and launch systems to support your product.

Course Objectives:

At the end of the semester, you'll be able to:

- Take an idea, create a prototype with Figma, and plan how you're going to build your web project with Trello
- Choose the front-end and back-end tech stack thats right for you
- Use Git & Github to collaborate with other developers by reviewing their code
- Build a continuous integration pipeline with Github Actions to continuously test and deploy your code to your test and production environments
- Extend your pipeline to continuously deploy your Firebase project to test and production environments
- Store data using modern serverless tools like Firebase's NoSQL database, or Object Storage
- Monitor the health of your product by reviewing logs, performance profiles, and metrics gathered by your web app.
- Review the security and compliance of your web app

Overview of the Course

Throughout the course, you’ll be working on 3 different projects to get an understanding of what you have to build to support your products.

Project Work

Project 1 - Creating a Static Website

Project 2 - Creating a Web API

Project 3 - Create A web app with users and a database

Grading

Project 1 - 25%

Project 2 - 25%

Project 3 - 50%

Attendance

Attendance isn’t required. You don’t need to notify me if you’ll be missing class.

You can attend the class remotely over Zoom, but the class will be slightly more focused on in-person activities. Recordings will be made available.

Late Assignments

- Assignments can be submitted for full-credit up until the deadline.
- You can get a 1-week extension with no penalty by sending a request for an extension to the TA
- Late submissions after the 1 week extension or WITHOUT notification take a 25% penalty.
- Assignments need to be submitted through Canvas (and Github when required). No submissions will be accepted over email.

Regarding Plagiarism:

- Yes, as programmers, its common to find useful code on the internet in the form of samples, snippets, templates, fully-baked projects, and starter packs.
- This is a course on building startup systems, and sometimes, the fastest way of doing that is reusing code and using templates.
- For the purpose of this course, I need to be able to identify and review **YOUR** work.
- Work will be considered plagiarized if you have not made substantial contributions of your own. Copying and pasting someone elses work with out major changes of your own doesn’t count.

- Work that is plagiarized will receive a 0 on the first offense
- You have a better chance at a higher grade if you avoid plagiarizing code. People who copy/pasted code they didn't understand weren't able to get their project running in time.

Rough Schedule

Week	Session 1	Session 2
1	1/22	1/24
	Syllabus Overview Project overviews	Wireframes, HTML/CSS, Practice exercises
2	1/29	1/31
	Different types of javascript modules	Event-based programming with JS
3	2/5	2/7
	Deployable packages + web servers	Monitoring, Access Logs, and Analytics
4	2/12	2/14
	Wireframes, web servers, npm node	modules, express, status codes
5	2/19	2/21
	unit testing, testing application code	Deployable packages, running node Milestone 1 due by 2/23
6	2/26	2/28
	NO CLASS	Open Lab Session
7	3/4	3/6
	Wireframes, frontend frameworks	Private pages, authentication
8	3/11	3/13
	Unit testing and web hosting	Monitoring, access logs
9	3/18	3/20

	Wireframes, data models #1	Wireframes, data models #2
10	3/25	3/27
	Private routes Project 2 Due (on 3/25)	Implementing data models with Firebase Storage
11	4/1	4/3
	No Class	No Class
12	4/8	4/10
	Writing new unit tests	Deploying to a web host
13	4/15	4/17
	Web security & standards	FLEX
14	4/22	4/24
	FLEX	FLEX
15	4/29	5/1
	FLEX	FLEX
16	5/6	
	Last Class Project 3 Due All Assignments Due	