CSC223: Software Engineering

Smith College [Fall 2023]

Instructor
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Place & Time
Bass 204

Tuesdays
Usually 1:20-4:00pm
Occasionally 7:00-9:30pm

Course Overview

All software that is used in the real world was created under real constraints. In this course you will learn how to engage in the messy-guessy process of specing, planning, designing, and building a software product that you intend to deploy "in the wild". In CSC223 you will:

- Compare engineering methodologies
- Practice rapid prototyping and agile development
- Model complex system architecture through diagrams
- Design human-centered software that meets needs and constraints
- Build (and possibly deploy) a real system using Ruby on Rails

Prerequisites: CSC210, confidence in coding ability, and willingness to learn new languages.

Format & Workload

Class meets weekly on Tuesday afternoons, except once a month when it is held in the evening. Those late meetings are indicated on the schedule and reminders will be given. Classes follow a **workshop format**. We begin with a short interactive lecture to unpack the readings, then switch to hands-on activities and group project work. You should expect to devote **9 hours per week outside of class** to complete your readings and assignments.

Reading Materials

Readings draw mainly from three books, all of which are recommended, none of which are required. You will be expected to reflect on **~2 chapters each week** during the first half of the course. Readings will all be **provided via Moodle** and thus you are not obliged to obtain them yourself. However, the books listed below are certainly worth reading in their entirety.

Ian Sommerville
Engineering Software Products: An Introduction to Modern Software Engineering

Don Norman
The Design of Everyday Things

Frederick P. Brooks, Jr.
The Mythical Man-Month: Essays on Software Engineering

Assignments

The majority of your work will be devoted to a three phase **group project** during which you specify, plan, and **build a software system** using the Ruby on Rails web framework. You will submit documentation, code, and reports jointly, and you will demo your product at the end of the semester as a team. Before the project begins you will individually set up your own development environment and complete a ~12 hour **series of trainings**. You will share eight **brief reflections** (~100 words) on readings with each other; and you'll compose a short (500-700 words) **research report**. All assignments are **due Mondays at midnight**.

Weekly Schedule

Week	Date	Topic	Assignment
1	Sept. 12	*What is Software Engineering?*	
2	Sept. 19	*Why is Software Engineering Challenging?* Product Management & Communication	Hello Stack
3	Sept. 26 🌙	*How Do Modern Software Engineering Teams Operate?* Agile Methods & Feature Driven Development	Group Prefs. Survey
4	Oct. 3	*How Do We Model Complex Systems?* Architecture & Abstraction	Training A
5	Oct. 10	[Autumn Recess]	
6	Oct. 17	*How Do We Decide What to Build?* User-Centered Design	Training B Group Contract
7	Oct. 24 🌙	*How Do We Build Elegantly for Complexity?* Patterns & Services	Training C
8	Oct. 31	*How Do We Engineer Robust Systems?* Risk Mitigation	Project Plan
9	Nov. 7	*How Do We Collaborate On Code?* Tools & Techniques	Midway Self Review
10	Nov. 14	*How Do We Engineer Just Systems?* Programming Ethics	
11	Nov. 21 🌙	[Thanksgiving Break Backup Day]	Project Prototype
12	Nov. 28	*Why Does This Feel So Hard? When Do We Launch?* (Re)Assessing Challenges + Deployment	Research Report
13	Dec. 5	*How Do We Do This For Real For Real?* Starting Up	
14	Dec. 12	Demo Day Presentations	Final Project Self-Team-Peer Reviews

Communication

All online communication for this course will take place **via Discord**. If you do not already have an account, please create one. **Join our server**, then follow the instructions in the **#welcome** channel to set your nickname and pronouns.

CSC223-F23 Discord Server Invitation: https://discord.gg/vQmhbcr2Nm

- **#announcements**: Important notices about class times, deadlines, office hours, etc.
- **#general**: Introduce yourself and discuss course-related material, off-topic ideas, etc.
- **#questions**: Ask any non-personal questions you have here. Use threads to respond. *And don't be shy; if you are wondering something, someone else is probably puzzled too!*
- **#reflections**: Share your reactions, thoughts, or confusion about the weekly readings.
- **DMs**: Message me directly for matters that require individual communication.

I will **try to answer questions within 24hrs** during the work week, but please ask your peers and TAs for help first. They will generally assist you more quickly; also remember I'm **not available on weekends**! Sometimes I miss DMs, so don't worry about pinging me again if you're waiting on a reply. Lastly, please note that I'm terrible at responding to email. I'll read it, but you'll either get a reply right away, or between two days and two years later.

Office Hours

Office hours are a time when you can **ask me questions about... anything!** Weekly hours are for any student who would like to chat with me and I hold them on a rotating schedule. To see upcoming office hours and ensure you get a slot, please **book a time via Calendly**. Most office hours are **available in person** or virtually, but I will announce during class the weeks when appointments will only be held **remotely on Gather**.

Reserve Time via Calendly: https://calendly.com/johannabrewer

Virtual Meetings on Gather: https://gather.town/app/NfY57eEoJJb22wzP/InclusiveDesignLab

Grading

This course follows an **"ungrading" approach**. In keeping with how software is evaluated, you will primarily receive qualitative feedback and only be assessed on a **simple scale**: needs improvement (C); meets expectations (B); exceeds expectations. (B+/A-); distinguished (A/A+). Additionally, you will **review your own performance** and weigh in on your final letter grade. Your overall assessment will be weighted to reflect the workload.

- 50% Major project assignments & trainings
- 20% Reading reflections & research report
- 30% Class participation & presentations

Your success in this class will depend on your **active engagement** with both the material and your classmates because software engineering is not a solo endeavor. To do well, you must demonstrate that you are working to master both **coding and communication**.

Academic Integrity

As honorable software engineers, when we build on the code of those who came before us, we credit their contributions. Whenever you collaborate with others, whether in designated groups or informally as study partners, you must **acknowledge your collaborators**. Likewise, I expect you to always **cite all sources** used when preparing your assignments. This includes books, papers, articles, websites, StackOverflow pages, blog posts, etc.

Participation & Absences

Though formal attendance will not be taken, you won't be able to participate in class if you are not there. We only meet twelve times so **your presence in each class matters**. You should **tell me in advance** of a planned absence; and if you have an emergency, please inform me after you are safe. If you must isolate for health reasons, please use Discord to **ask your peers to stream class** for you via Zoom or Gather. Inform me ahead of time, but try to organize this yourself. Regardless, remember to **stay home if you feel unwell**.

Extensions & Lateness

It is important you **work in a timely fashion**. Programming assignments and reading reflections are due by midnight on Mondays. But if you need additional time to complete your individual work, DM me to request it, **late is better than never**. Extensions on group assignments will only be given when a team member's Dean provides a written request.

Comfy Class Policies

Laptops and phones can be distracting, but they are important tools for us. Please avoid using your devices in class for purposes other than coursework. Hydration is essential, so bring beverages, but you must use **closed containers** to avoid spills. We have two breaks during which you can have a snack, but please **refrain from eating** during class. Everyone is welcome to use **concentration accommodations** like fidget toys, knitting, doodling, moving around, or sitting on the floor; just be mindful your focus doesn't disrupt others.

Fostering Respect & Inclusion

During this course we will be working closely together. When communicating with one another, I expect you to practice **active listening**. When someone is talking, focus on understanding what they are expressing rather than thinking of how you will respond. Additionally, keep in mind that our wide array of individual backgrounds shape our unique perspectives, so please **respect one another** when we have sincere differences of opinion.

Diversity Statement & Equity Commitment

As a mixed-race, Native, non-binary, neurodivergent person who was the first in their family to earn a doctoral degree, I have a stake in bettering, and first-hand knowledge regarding, the experience of marginalized folks in our society. I know that a welcoming learning environment can have a real impact, and so I am committed to making this **classroom a comfortable place** for all my students. Please let me know if you ever have thoughts, questions, or concerns about ensuring that we **treat one another equitably**.

Accessibility & Accommodations
Written course materials including readings, slides, and lecture notes will be provided as PDFs that are screen reader compatible and all audio/visual media will offer captions. If you have any issues accessing the materials, let me know as soon as possible and I will work to find a solution. Should you encounter barriers to participation in this or any other course, **contact Disability Services** via email at ods@smith.edu or by calling (413) 585-2071 to make an appointment to discuss support and accommodations.

Health Resources
College can be stressful, but you are not alone. Reach out for help if you are feeling unwell or overwhelmed. The Schacht Center on campus provides a variety of **free & confidential** health and counseling services. Email healthservices@smith.edu or call (413) 585-2250 for any medical concerns. To set up an appointment for mental health support you can email counselingservices@smith.edu or **call (413) 585-2840 if you are in crisis**.

Acknowledgments
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