CSC223: Introduction to Software Engineering

Smith College [Fall 2021]

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Place & Time
Seelye 106

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 & agile development
- Model complex system architectures
- Design software that satisfies needs & constraints
- Build & maintain a real system

Format & Workload
Class meets weekly on Tuesday afternoons, except once a month when it will be held in the evening. Those evening meetings will be announced the week prior with a reminder sent the day before. Classes will follow a **workshop format**. We will begin with a short lecture to review the readings followed by a group discussion, then switch to hands-on activities and project work. You should expect to devote **8 hours per week outside of class** to complete your readings and assignments.

Reading Materials
Readings for this course will draw from three books, all of which are recommended, none of which are required. You will be expected to read and reflect on **2-3 chapters each week**. These 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
Global Edition 2021

Don Norman
The Design of Everyday Things
Revised and Expanded Edition 2013

Frederick P. Brooks, Jr.
The Mythical Man-Month: Essays on Software Engineering
20-Year Anniversary Edition 1995

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**. You will submit documentation, code, and reports jointly, and you will demo your product at the end of the semester as a team. Additionally, every week before class you will each write **brief reflections** (200-300 words) on the readings and you'll also compose two succinct (500-700 words) **research reports**.

Weekly Schedule

Week	Date	Topic	Major Assignments
1	Sep. 7	*What is Software Engineering?*	
2	Sep. 14	*Why is Software Engineering Challenging?* Product Management & Communication	Hello Stack App
3	Sep. 21	*How Do Modern Software Engineering Teams Operate?* Agile Methods & Feature Driven Development	
4	Sep. 28	*How Do We Model Complex Systems?* Architecture & Abstraction	Group Contract
5	Oct. 5	*How Do We Decide What to Build?* User-Centered Design	
6	Oct. 12	[Autumn Recess]	
7	Oct. 19	*How Do We Build Elegantly for Complexity?* Patterns & Services	Project Plan
8	Oct. 26	*How Do We Engineer Robust Systems?* Risk Mitigation	
9	Nov. 2	*How Do We Engineer Just Systems?* Programming Ethics	Research Report A
10	Nov. 9	*How Do We Collaborate On Code?* Tools & Techniques	Research Report B
11	Nov. 16	*Why Does This Feel So Hard?* (Re)Assessing Challenges	Project Prototype
12	Nov. 23	*When Do We Launch? What Do We Do After?* Deployment & Evaluation	
13	Nov. 30	*What Do We Want to Learn More About?* Student-Led Topic	
14	Dec. 7	Demo Day Presentations	Final Project + Report Self-Team-Peer Reviews

Communication
All online communication for this course will take place **via Discord** (a text, voice, and video chat service popular with gamers, live streamers, and programmers). If you do not already have an account, please create one. **Join our server** using the invitation, then follow the instructions in the pinned message in #general to set your nickname and pronouns.

CSC223-F21 Server Invitation
https://discord.gg/rVp8Z2vnnx

- #announcements: Important notices about assignments, office hours, deadlines, etc.
- #general: Discussion about course material, engineering problems, off-topic ideas, etc.
- #questions: If you are wondering something, chances are someone else is puzzled too. Post any non-personal questions you have here.
- DMs: Message me directly for matters that require individual communication.

I will endeavor to answer time-sensitive questions within one workday, but please try to turn to your peers and the TAs for help first. Chances are they will assist you more quickly. Sometimes I miss DMs, so don't be shy 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 drop-in hours are for any student who would like to stop by and chat. Drop-in hours occur on a rotating schedule; times and dates will be announced on Discord. You are also welcome to book a 1-1 appointment if you need a different time or would like to speak more privately. For now, office hours will be **held remotely** in my lab **on Gather**.

Inclusive Design Lab on Gather
https://gather.town/app/NfY57eEoJJb22wzP/InclusiveDesignLab

Grading
Assessment of performance in this course is weighted to reflect the workload. In keeping with how software is evaluated, most submissions will be graded on a **simple scale** of: needs improvement; meets expectations; exceeds expectations; distinguished.

- 50% Major project assignments
- 25% Reading reflections & research reports
- 25% 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
Much of the work for this class will be done in groups, but every student will complete significant pieces individually. As software engineers, we all build on the code of those who came before us, and as honorable scholars, 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 not only books, papers, and articles but also websites, StackOverflow pages, social media 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 thirteen times so **your presence in each class matters**. If you know you will have a planned absence, please let me know two days in advance; and if you have an emergency, please inform me after you are safe.

Extensions & Lateness
It is essential you complete your work in a timely fashion. Programming assignments are due by midnight on Mondays and written assignments are required to be submitted an hour before class begins. The assignments are designed to prepare you for our in class activities, and so extensions will only be given in cases where the student's Dean provides a written request. **Lateness will impact assessments** and you should expect delayed feedback on work submitted after the deadline.

Comfy Class Policies
Laptops and phones can be distracting, but they are important tools in our work. I propose we might benefit from having a live chat available for silent participation during class, but we should discuss and collectively set a policy for how we use devices. Similarly, hydration is essential so you are welcome to bring beverages, but you must use **closed containers** to avoid spills. We will have two breaks during which you can have a snack, but while we are still masking let's **refrain from eating** during class.

Fostering Respect & Inclusion
During this course we will engage in a variety of discussions, activities, and projects that rely on your ability to work together. So that we can build our sense of community, please keep a paper placard with your **name and pronouns** on your desk. Similarly, make sure you change your Discord nickname to your preferred first name and set your pronouns in our channel. When communicating with one another, whether in class or online, I expect you to practice **active listening**. When someone is speaking (or typing), you should be focused on understanding what they are expressing rather than thinking of how you will respond. Additionally, I ask you to remember that we all come from different backgrounds that shape our unique perspectives, and so we ought to **respect one another** when we have sincere differences of opinions.

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 stake in bettering, and a 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
Learning and teaching with masks on will be a challenge for all. My voice will be amplified during class. but if you have trouble understanding what someone is saying, hold up three fingers ('W' in the ASL alphabet) to indicate you are not clear on what they are sharing. You are welcome to use a live captioning app on your mobile device if it increases your ability to understand when others speak. Course materials including readings, slides, and lecture notes will be provided as PDFs that are screen reader compatible. 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, please reach out to Laura Rauscher, **Director of Disability Services, by calling (413) 585-2071** to make an appointment to discuss support and accommodations.

Health Resources
College can be stressful, even more so in the midst of a pandemic, but you are not alone. Please 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. You can 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
Some of the materials used in this course are derived from previous classes at Smith, as well as similar courses taught at other institutions. Thanks to my academic colleagues, especially Alicia M. Grubb, for sharing their syllabi.