

CS 3500: Software Practice

Course Details and Objectives Spring 2021

Course Information

COVID-19^Δ

Items marked with the Δ symbol indicate special changes in how CS 3500 is offered in Spring 2021 due to COVID-19, and should not be expected in future classes.

Description of CS 3500

Large software systems are some of the most complex artifacts ever created. The field of software engineering encompasses the study and application of effective tools and techniques for organizing the efforts of teams of people towards designing, developing, deploying, and maintaining software systems. CS 3500 is an introduction to software engineering. Although you will learn about all the steps involved in creating a system, we will focus primarily on the software construction step by building on the programming background that you acquired from CS 1410 and CS 2420. CS 3505 will in turn build on this course by treating the rest of the software development process in more depth. In CS 3500, we will bridge the gap between introductory programming and full-blown software engineering.

Instructor

Daniel Kopta, *Email:* dkopta@cs.utah.edu

Lectures^Δ

Lectures are pre-recorded videos and will be posted online each week along with accompanying materials such as slides and code demos.

Labs and Recitations^Δ

When you enrolled in this class, you selected a specific section with a discussion component covering two days each week. One of those days is a lab, and the other is a recitation. You can find more details about this schedule on Canvas.

Laptop Requirement

Per School of Computing policy, students enrolled in a CS class with a lab/discussion component are required to use their own laptop for the lab. Students are responsible for administering their own laptops, such as installing Windows and Visual Studio. For recommendations and further information, please see the official policy:

https://handbook.cs.utah.edu/2020-2021/Academics/laptop_policy.php

Recitations^Δ

Recitation sections, which meet on Wednesdays, are added for Spring 2021 to provide students with synchronous and face-to-face (for some sections) instruction, while observing restrictions due to the COVID-19 pandemic. Recitations are a critical way of engaging students continuously throughout the semester. Students can expect material and exercises not covered by lecture videos or labs to be presented in recitations. The online sections will hold recitations via Zoom.

Labs^Δ

Labs are weekly meetings led by the TAs via Zoom designed to give you practice with the concepts discussed in class and other necessary instruction. Lab activities must be completed for credit.

Class Website

The class website is on Canvas at utah.instructure.com. It will contain all pertinent course info and materials, such as lectures, announcements, updates, corrections, and grades. Students are required to check their email and Canvas regularly until final grades are posted.

Coursework

Grading

Your grade for this course will be determined by the following:

Assignments	50%
Midterm exam	15%
Final exam	15%
Labs	10%
Quizzes	10%

If X is your overall course score, letter grades will be assigned using the below scale. Scores will *not* be rounded.

	$90 > X \geq 87$ B+	$80 > X \geq 77$ C+	$70 > X \geq 67$ D+	
$100 \geq X \geq 93$ A	$87 > X \geq 83$ B	$77 > X \geq 73$ C	$67 > X \geq 63$ D	$60 > X \geq 0$ E
$93 > X \geq 90$ A-	$83 > X \geq 80$ B-	$73 > X \geq 70$ C-	$63 > X \geq 60$ D-	

Assignments

Roughly the first half of the semester will consist of weekly software development assignments using C# in Visual Studio. These assignments will all build towards one larger software system. The specifications and due dates will be posted online each week.

The second half of the semester will consist of a team project implementing a multiplayer networked game. Development of this project will be mostly from scratch.

You will hand in your software through your *Github* repository (info on this forthcoming). Assignments will be graded on readability, comments, design of the code, as well as correctness in execution. Partial credit may be given for incorrect or incomplete assignments, but it must be clear that a strong attempt was made. If your software does not compile or run according to the specifications, no credit will be given.

Exams^Δ

Both exams will be online this semester. The midterm exam will be given during the week of March 1. The final be given on Monday, May 3. These dates are subject to change, but we will notify you promptly if they do.

Quizzes

There is a short quiz on Canvas associated with each lecture. In general, there will be two quizzes due each week, and they are designed to not take very long. Quizzes will not be accepted late. The lowest two quiz scores will be dropped.

Getting Help

See the Getting Help page on Canvas for further details.

Office Hours^Δ

My office hours on Zoom will be posted on Canvas shortly after the start of the semester.

TA Consulting Hours^Δ

The teaching assistants will have regularly scheduled consulting hours on Zoom. They will help with any course content. The TA consulting schedule will be posted on Canvas shortly after the start of the semester.

Other Issues

Send messages to the teach staff via Piazza if you have issues or questions that can't be resolved on the student help forums, such as a grading issue, or if your question requires posting code. See the "Getting Help" page on Canvas to set up your Piazza account. If you have a question about a personal matter, or one that does not relate to the course, feel free to email me directly at dkopta@cs.utah.edu.

We will send email and announcements to everyone in the class, such as corrections to assignments, changes to due dates, clarifications, etc. through the class web page. Students are required to check their email and the class web page regularly.

Course Guidelines

Zoom[△]

Zoom is used for all labs, TA help hours, instructor office hours, and some recitation sections. Links for joining each meeting are available through Canvas. Students must use their @utah.edu zoom account and their first and last names (as they appear in Canvas) in their Zoom profile, such that the correct name appears during meetings. Students are responsible for their behavior in a Zoom meeting, just as they are in person. Inappropriate behavior (including posting offensive messages or content) constitutes academic misconduct.

Piazza

Piazza is used for questions and discussions related to CS 3500. A student must use their first and last names (as they appear in Canvas) in their Piazza profile, such that the correct name is visible to the instructor and TAs on posts. Note that students may select to post anonymously, such that their name is not visible to classmates.

Working Together

Some of the work in this class will be completed in pairs with another student. When pair work is required, students must adhere to the techniques of pair programming (remotely via desktop sharing[△]). Partners are required to contribute equally to the work. Students are encouraged to discuss high-level solution strategies with fellow classmates, but each student is responsible for writing their own answer. Cheating is: sharing (outside of a partnership) written or electronic work either by copying, retyping, looking at, or supplying a copy. Cheating is not: discussing concepts, answering questions about concepts or clarifying ambiguities, or helping someone understand how to use the class tools and software. There must be no collaboration during quizzes or exams. See the class web page for the cheating policy for this course. See the University of Utah Student Code for a detailed description of the University policy on cheating. Any student found cheating will fail the course. Supplying cheated materials is considered cheating just as using them is.

Late Work[△]

Each assignment's deadline is followed by a three-day late period. You may use the late period on up to two assignments with no penalty. Unused late assignment allotments will not grant extra credit. Third and subsequent late assignments will incur a penalty of 15% of the assignment's max value if submitted within the 24-hour period following the due date. This penalty increases by 15% per 24-hour period, up to three days. Work submitted more than three days late will not receive credit. An assignment is considered late if submitted any amount of time past the deadline, as measured by the submission system. Any delays caused by the submission system or corrupt/lost files is not an excuse for lateness. **Do not risk submitting at the last minute.** Late days apply to programming assignments only; other work, such as labs and quizzes, will not be accepted late.

Github

Your code for this class will be stored on a private Github repository owned by the course staff. Your repository may be deleted after the end of the semester. Make sure you backup your work if you want to keep it after the end of the semester.

College of Engineering Guidelines

For information on withdrawing from courses, appealing grades, and more, see:
<https://www.coe.utah.edu/semester-guidelines>

Students with Disabilities

The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.

Safety

The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

Violence and harassment based on race, national origin, color, religion, age, disability, sex or gender (which includes sexual orientation and gender identity/expression) is a civil rights offense and will not be tolerated. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776.

COVID-19^Δ

Face Coverings

Based on CDC guidelines, the University requires everyone to wear face coverings in shared public spaces on campus, including our classroom. As a reminder, when the instructor wears a face covering, they are protecting students. When a student wears a face covering, they are protecting the instructor and all of their classmates. If a student forgets to wear a face covering in class, the instructor will ask them to leave class to retrieve it. If a student repeatedly fails to wear a face covering in class, they will be referred to the Dean of Students for a possible violation of the Student Code.

Note that some students may qualify for accommodations through the Americans with Disabilities Act (ADA). Any student who thinks they meet these criteria and desires an exception to the face covering policy, should contact the Center for Disability and Access (CDA). Accommodations should be obtained prior to the first day of class so that the instructor is notified by CDA of any students who are not required to wear a face covering.

Positive COVID-19 Tests

Any student who tests positive for COVID-19 must self-report via coronavirus.utah.edu

Course Objectives

Upon completion of CS 3500, students will be able to:

- Design and implement large and complex software systems (including concurrent software) through the use of libraries (both standard and custom), and modern software development tools (such as debuggers, profilers, and revision control systems)
- Perform input validation and error handling, as well as employ advanced testing principles and tools to systematically evaluate software
- Apply the model-view-controller pattern and event handling fundamentals to create a graphical user interface
- Exercise the client-server model and high-level networking APIs to build a networked software system
- Appreciate the collaborative nature of software development

Background

A portion of the course will be devoted to studying C#. All students should have had an introductory programming course (such as CS 1410) and a programming-intensive course in algorithms and data structures (such as CS 2420). Most of you will have learned some combination of Java, Python, and/or C++ in these two courses. Regardless of the particular language(s) you have used, you should be proficient in these topics:

- Using a development environment to create, compile, test, and debug programs
- Implementing classes (understanding member variables and their role in information hiding, constructors and their role in initialization, methods and their role in abstraction)
- Implementing constructors and methods (using method calls, assignments, conditionals, and loops)
- Using and implementing common algorithms (e.g., sorting and searching) and data structures (e.g., stacks, queues, lists, trees, hash tables, etc.) as well as the use of generics or templates
- Exploiting class libraries, especially those that provide common algorithms and data structures
- Understanding techniques for exploiting polymorphism via inheritance and interfaces

If you do not have this background, you should not take CS 3500.