CS_100_001 - SOFTWARE CONSTRUCTION

Overview

CS 100 is a course created to teach you one simple principle, “think twice, develop once”. The purpose of this course is to serve as an introduction to the construction of large software systems and the additional skills and methods required to do so effectively. This includes development methods, tools, infrastructure, documentation, testing, and architectural thinking.

Catalog Description

Emphasizes the development of software systems. Topics include design and implementation strategies; selection and mastery of programming languages, environment tools, and development processes. Develops skills in programming, testing, debugging, performance evaluation, component integration, maintenance, and documentation. Covers professional and ethical responsibilities and the need to stay current with technology.

Course Details

Instructors:

Reem Ali (Please communicate via Slack, not email)

> **Office Hours: Tue** and **Wed** 1:00 PM - 2:00 PM via Zoom (or by appointment)
>
> > **Zoom ID:** 950 3871 9609 (**https://ucr.zoom.us/j/95038719609 (https://ucr.zoom.us/j/95038719609)**)

Neftali Watkinson Medina

> **Office Hours: Wed** and **Thu** 3:00 PM - 4:00 PM via Zoom (or by appointment)
>
> > **Zoom ID:** 924 1053 3071 (**https://ucr.zoom.us/j/92410533071 (https://ucr.zoom.us/j/92410533071)**)

Teaching Assistants: TBA

Lectures: Lectures will take place in person at the ***Student Success Center - Room 329***. Instructors will also try to record lectures on Zoom/YuJa and post the recordings for your reference. However, if you are symptomatic, or would not be able to come to class on a particular day for a legitimate reason, you

must directly message your instructor for permission to attend through Zoom and/or make up missed work. When attending through Zoom, please login using your OFFICIAL UCR email identity.

Do not use the following Zoom links without instructor approval:

Section 001 (Ali): **Mon, Wed and Fri** 6:00 PM - 6:50 PM

> **Zoom ID:** 963 8028 4239
> **Passcode**: 311095
> (https://ucr.zoom.us/j/96380284239?pwd=TERrcWwyNXhxYkxxa2MyUmZRN1B6UT09 (https://ucr.zoom.us/j/96380284239?pwd=TERrcWwyNXhxYkxxa2MyUmZRN1B6UT09))

Section 002 (Medina): **Mon, Wed and Fri** 7:00 PM - 7:50 PM

> **Zoom ID:** 98340744233
> **Passcode**: 985698
> (https://ucr.zoom.us/j/98340744233?pwd=SThDRHVDa09yZnZnOU9QbUNwOXJyZz09 (https://ucr.zoom.us/j/98340744233?pwd=SThDRHVDa09yZnZnOU9QbUNwOXJyZz09))

Please note that this quarter is a special quarter with COVID-19 safety requirements and new return-to-campus plans which implies that current plans might change at any time during the quarter.

Lab Sessions: All lab sessions will take place online through Zoom (see the table below for information to join your lab).

Section	Day	Time	TA	Zoom Meeting Details
021	Tue	8:00 AM - 9:50 PM	TBA	**Zoom ID:** TBA **Passcode:** TBA (link)
022	Tue	10:00 AM - 11:50 AM	TBA	**Zoom ID:** TBA **Passcode:** TBA (link)

023	Tue	12:00 PM - 1:50 PM	TBA	**Zoom ID:** TBA **Passcode:** TBA (link)
024	Tue	2:00 PM - 3:50 PM	TBA	**Zoom ID:** TBA **Passcode:** TBA (link)

Course Access

All course slides and material, as well as links to the assignments and labs, will be posted to Canvas (**eLearn (http://elearn.ucr.edu)**). Ethics assignments will be available on the platform under **Assignments** and under **Discussions**. The labs, and final project work will be submitted through **GitHub**. You will need to have a **GitHub account (https://github.com/join)** for this course; however, that account does not need to be related to your UCR NetID (any GitHub account is fine). In-class activities will be submitted on Canvas and/or GradeScope, unless otherwise stated by your instructor. **Announcements and all other class communication will be over Slack.**

Communication:

ALL sections will use a singular, shared forum for communication, via Slack.

- **Slack** signup: **Invitation Link (https://join.slack.com/t/cs100-fall2021/shared_invite/zt-w2d217fn-syQrdAmTvNMLNvwd22uBwA)**
- **Slack** workspace: **https://cs100-fall2021.slack.com (https://cs100-fall2021.slack.com)**

In **Slack**, please post *all* questions and answers on the #general channel. Please *do not* Direct Message the instructor, unless it is a (1) medical or (2) grades issue. Make sure you are signed-up and participating on Slack BEFORE classes begin. "I did not get invited to Slack," is no excuse for missing important announcements. If you feel the urge to SPAM, please use the #random channel to avoid clutter.

Online Etiquette:

- Please use your OFFICIAL UCR email identity when registering on Slack and Zoom.
- Identify yourself by changing your handle on Slack and Zoom to use the pattern: [name] - [netid].

- Humor and enjoyment is fine, but please treat others with respect.
- It is generally a good rule of thumb to avoid excessive sarcasm, which is easily misinterpreted.
- We do not put others down. We do not make hurtful remarks.
- We apologize if we do hurt others, and we forgive innocent mistakes.

Textbook

Design Patterns: Elements of Reusable Object-Oriented Software (http://www.amazon.com/Design-Patterns-Elements-Reusable-Object-Oriented/dp/0201633612/ref=sr_1_1?ie=UTF8&qid=1451865096&sr=8-1&keywords=design+patterns)

Available online here through UCRs agreement with O'Reilly:

https://ucr.primo.exlibrisgroup.com/permalink/01CDL_RIV_INST/bt8e2/alma991033538968304706 (https://ucr.primo.exlibrisgroup.com/permalink/01CDL_RIV_INST/bt8e2/alma991033538968304706)

This textbook is not required but has been *highly* recommended by students from previous quarters as an aid to the lecture material. It also makes an excellent desk reference for design patterns.

Coursework & Grading (Subject to Change)

Labs (Equally Weighted)	25%
Project	25%
Ethics Assignments	10%
Participation	10%
Exams	30%
Total	**100**

Grades usually follow a 90/80/70/60 scale, with +/- grades. A+ is reserved by the instructor's discretion.

Labs

While lab attendance will not be recorded you are highly encouraged to attend so you can show your work and get help with lab assignments. If you cannot attend the lab for a legitimate reason, please contact your instructor and lab TA. With the exception of Lab 1, the remaining labs will be done in pairs. You and your partner need to be enrolled in the same lab section. You will need to perform a demonstration to be checked off by your TA (or readers) to receive credit for a lab. Each lab is assigned during a lab session on a particular week, and the demo is due by Friday of the following week (see schedule for details). However if you demo a lab before the end of your designated lab session on Tuesday, you will be rewarded with a **10% bonus.** Demos can occur during the lab session in which a lab is assigned, during the lab session the following week, or during a demo slot scheduled with your TA (or readers) by the lab due date. You should come to your scheduled demo with your lab completed, and ready to demo, or you will receive a 0 for that lab.

If you need to switch lab sections for any reason, including attending one lab section before being officially enrolled in the course and then having to attend another lab section, please inform both your previous TA and your new TA of the change so they can transfer your grade between sections.

Ethics Assignments

There will be four Ethics assignments. We will be using the Canvas discussion platform where you will interact with a group assigned by the instructor following a different prompt. Early participation is key and part of your grade. Specific instructions will be released with each assignment.

Project

The project milestones **must** be completed in teams of four. We highly encourage you to stay with your lab partner and join another pair to form the team. Code for the project should be committed to GitHub regularly and the segments written by each partner should be committed **by that partner**. GitHub commit logs are used to corroborate any allegations of partners failing to complete their portion of the project or failing to meet the coding requirements of the course. Code committed to GitHub is considered reviewable by the instructor for cheating and incomplete work claims.

Collaboration, Cheating & Self Plagiarism

Engineering is a team sport, because of this it is acceptable to get feedback from your peers on the correctness of your solutions and ideas. However, you are not allowed to ask for or provide complete solutions to problems. Remember that doing the required work for others only makes them less likely to pass exams (and is a violation of **UCR's academic integrity policy (http://senate.ucr.edu/bylaws/?action=read_bylaws&code=app&section=06)**).

Any student who is caught cheating in this course on an exam, lab, homework, or project milestone will **automatically fail the course** and have their case **submitted for judicial review**. You will not have an opportunity for a second attempt at that particular exam, lab, homework, or project milestone. If you have taken this course in the past and have some previous material please reach out to the instructor to discuss what can and cannot be re-used for this quarter. **Do not** simply re-submit your previous labs or project code. If you reuse your own code from a previous quarter you will receive 0 points on the project milestone or lab and may be submitted for judicial review.

Tentative Schedule

	Date		Lecture	Homework Assignments	Lab Discussion (Tuesdays)	Lab Due	Project
Week 0	9/24/2021	Friday	Class Intro				
Week 1	9/27/2021	Monday	Intro to Git and GitHub		Intro to Tooling		Contact lab TA by Thu if no lab and/or project group
	9/29/2021	Wednesday	Intro to Git and GitHub				
	10/1/2021	Friday	Unit and Integration Testing				
Week 2	10/4/2021	Monday	Interfaces in OOP/ **Take home Exam 0**	Ethics 1	Gitflow	Intro to Tooling (Bonus by Tue, Due Friday)	
	10/6/2021	Wednesday	Development methods				
	10/8/2021	Friday	Development methods / **Exam 0 due**				
Week 3	10/11/2021	Monday	User Stories	Ethics 1 Due	Valgrind	Gitflow (Bonus by Tue, Due Friday)	
	10/13/2021	Wednesday	User Stories				
	10/15/2021	Friday	**Exam 1**				
Week 4	10/18/2021	Monday	UML notation	Ethics 2	Github Actions	Valgrind (Bonus by Tue, Due Friday)	
	10/20/2021	Wednesday	Design Pattern Overview				Proposal (Due Wednesday)

	10/22/2021	Friday	Composite Pattern				
Week 5	10/25/2021	Monday	Composite Pattern	Ethics 2 Due	Composite	Github Actions (Bonus by Tue, Due Friday)	
	10/27/2021	Wednesday	SOLID				
	10/29/2021	Friday	Strategy Pattern				
Week 6	11/1/2021	Monday	Strategy Pattern	Ethics 3	Strategy	Composite (Bonus by Tue, Due Friday)	
	11/3/2021	Wednesday	Abstract Factory Pattern				
	11/5/2021	Friday	**Exam 2**				Design Document (Due Friday)
Week 7	11/8/2021	Monday	Abstract Factory Pattern	Ethics 3 Due	Factory	Strategy (Bonus by Tue, Due Friday)	
	11/10/2021	Wednesday	Iterators				
	11/12/2021	Friday	Visitor Pattern				
Week 8	11/15/2021	Monday	Visitor Pattern	Ethics 4	Visitor	Sprint (Bonus by Tue, Due Friday)	Sprint Meeting (Due at lab time)
	11/17/2021	Wednesday	Testing Methods				
	11/19/2021	Friday	Testing Methods				
Week 9	11/22/2021	Monday	Ethics	Ethics 4 Due		Factory and Visitor (Bonus by Tue, Due Friday)	
	11/24/2021	Wednesday	Privacy and Security				
	11/26/2021	Friday	**HOLIDAY**				
Week 10	11/29/2021	Monday	Advanced topics			Final project demos (Due during lab on Tue, late submission due Dec 7th)	Final Submission (Due at lab time)
	12/1/2021	Wednesday	Advanced topics/Review				
	12/3/2021	Friday	**Exam 3**				