

Syllabus

CSE-120-01, Fall 2021

Designation:

CSE 120 Software Engineering

Catalog Description:

Building large software systems is hard, but experience shows that building large software systems that actually work is even harder. And trying to do all this before your competitors has proved fatal to many software projects. This course covers techniques for dealing with the complexity of software systems. We will focus on the technology of software engineering for the individual and small team, rather than business or management issues.

Textbooks and Other Required Materials:

There is one textbook for this class along with selected readings.

"Code Complete" by Steve McConnell, ISBN: 9780735619678

Following books are recommended if you want to read more about the topics covered in class.

- "Software Engineering. A Practitioner's Approach (6th ed.)" by Roger Pressman
- "UML Distilled: A Brief Guide to the Standard Object Modeling Language (2nd ed.)" by Martin Fowler
- "Extreme Software Engineering. A Hands-On Approach" by Daniel H. Steinberg, Daniel W. Palmer
- "Design Patterns: Elements of Reusable Object-Oriented Software" by Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides

Course Objectives/Student Learning Outcomes:

This course is unique in the CSE curriculum in that students are involved in a large-team unique project. Students will see what it takes to collaborate with people with different skills and approach to software development. Students will select an industry-sponsored project and almost all aspects of development (programming language, libraries, build environment, etc.)

By the end of the course, students will be able to:

- 1) Gather information about a contemporary problem, and consolidate them into requirements, to produce a technical specification.
- 2) design a computing solution to a challenging contemporary problem, within realistic constraints and utilizing appropriate standards.
- 3) use project management and teamwork skills to deliver a solution within time constraints.
- 4) deliver a professional presentation appropriate to a broad audience.
- 5) demonstrate effective written technical communication skills through design exams.

Program Learning Outcomes:

- An ability to apply knowledge of computing and mathematics appropriate to the discipline;
- An ability to analyze a problem and identify the computing requirements appropriate for its solution; An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs, and use current techniques, skill, and tools necessary for computing practice;
- An ability to function effectively as a member of a team in order to accomplish a common goal;
- An ability to communicate effectively with a range of audiences;

- An ability to analyze the local and global impact of computing on individuals, organizations, and society;
- Recognition of the need for and an ability to engage in continuing professional development;
- An ability to apply mathematical foundations, algorithmic principles, and computer science theory to the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;
- An ability to apply design and development principles in the construction of software systems of varying complexity.

Prerequisites by Topic:

Class Prerequisite: CSE 100, Senior standing.

Topics:

- Software Development Process
- Requirements and Specification
- Unified Modeling Language
- Design Patterns
- Code Process
- Version Control
- Testing
- Debugging
- Concurrency
- Code Tuning
- Security
- User Interface
- Quality Management.

Class/laboratory Schedule:

Lecture: MW 3:00-4:15pm, SSB 130
 Lab: 02L T 7:30-10:20am, SCIENG 100
 03L W 4:30-7:20pm, SSM 154
 04L R 4:30-7:20pm, SCIENG 100

Midterm/Final Exam Schedule:

This schedule is subject to change, but is tentatively set as follows:

- Midterm: During Week 11 (10/31 – 11/06)
- Final Presentations: During Weeks 16 (12/05 – 12/11) and 17 (12/12 – 12/18)

Assessment/Grading Policy:

Participation	5%
Reading Assignments	8%
Lab Assignments	15%
Midterm	12%
Weekly Meeting Minutes	10%
Project	50% (30% as a team, 20% as individuals)

Coordinator:

Santosh Chandrasekhar

Contact Information:

My email: schandrasedkhar@ucmerced.edu

I will try to answer your emails within 48 hours. However, I may not be able to answer emails after 5:00 p.m. or during weekends/holidays. Please plan accordingly.

TAs' emails:

Akshay Bhatia – abhatia8@ucmerced.edu

Suryabhan Singh Hada – shada@ucmerced.edu

Office Hours:

Santosh Chandrasekhar: T 11:00-1:00pm, SE2 273 and via Zoom

Akshay Bhatia: F 10:00-11:00am, SE2 Lobby and via Zoom

Suryabhan Singh Hada: R 2:30-4:30pm, SE2 Lobby and via Zoom

You may, of course, make an appointment to meet with the instructor or TA if necessary.

Course Policies:

Attendance of labs are mandatory for receiving participation grades, and also because this may be the only time you can meet with your team members to plan your project tasks and discuss any issues that may arise.

There will be reading assignments, project milestone assignments, presentations, and status/update meetings throughout the semester. Each team member is required to participate in order to receive portion of the individual scores of the Class Project and receive participation grades. Presentation dates will be announced when the assignments are released.

IMPORTANT:

Meeting minutes of each team is due weekly. Failure to attend team meetings, fulfill assigned tasks, or participate in presentations will result in receiving an 'F' as your final grade.

Disability Statement:

Accommodations for Students with Disabilities: The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.

Academic Integrity Policy:

The campus Academic Honesty Policy states:

"Academic integrity is the foundation of an academic community. Academic integrity applies to research as well as undergraduate and graduate coursework. Academic misconduct includes, but is not limited to cheating, fabrication, plagiarism, altering graded examinations for additional credit, having another person take an examination for you, or facilitating academic dishonesty or as further specified in this policy or other campus regulations.

Cheating is the unauthorized use of information in any academic exercise, or another attempt to obtain credit for work or a more positive academic evaluation of work through deception or dishonesty. Cheating includes, but is not limited to: copying from others during an examination; sharing answers for a take-home examination without permission; using notes without permission during an examination; using notes stored on an electronic device without permission during an examination; using an electronic device to obtain information during an exam without permission; taking an examination for another student; asking or allowing another person to take an examination for you; tampering with an examination after it has been corrected, then returning it for more credit

than deserved; submitting substantial portions of the same academic work for credit in more than one course without consulting the second instructor; preparing answers or writing notes in a blue book before an examination; falsifying laboratory, or other research, data or using another person's data without proper attribution; allowing others to do the research and writing of an assigned paper (for example, using a commercial term paper service or downloading a paper from the internet); and working with another person on a project that is specified as an individual project.

Plagiarism refers to the use of another's ideas or words without proper attribution or credit. This includes, but is not limited to: copying from the writings or works of others into one's academic assignment without attribution, or submitting such work as if it were one's own; using the views, opinions, or insights of another without acknowledgment; or paraphrasing the ideas of another without proper attribution. Credit must be given: for every direct quotation; when work is paraphrased or summarized, in whole or in part (even if only brief passages), in your own words; and for information which is not common knowledge. The requirement to give credit applies to published sources, information obtained from electronic searches, and unpublished sources.

Collusion is when any student knowingly or intentionally helps another student to perform any of the above acts of cheating or plagiarism. Students who collude are subject to discipline for academic dishonesty. No distinction is made between those who cheat or plagiarize and those who willingly facilitate cheating or plagiarism."

More information about the policy and the Office of Student Conduct can be found here:

<http://studentconduct.ucmerced.edu/>

Some students may still have some confusion (albeit the policy is quite clear), in particular concerning collaboration. The following rules are in place to make this issue clearer, from the perspective of my class.

Cheating vs. Collaboration: Collaboration is a very good thing. On the other hand, cheating is considered a very serious offense. **Please don't do it!** Concern about cheating creates an unpleasant environment for everyone. If you cheat, you risk losing your position as a student in the college. The school's policy on cheating is to report any cases to the university judicial office. What follows afterward is not fun. So how do you draw the line between collaboration and cheating? Here is a reasonable set of ground rules. Failure to understand and follow these rules will constitute cheating and will be dealt with as per university guidelines.

The Simpson's Rule: This rule says that you are free to meet with a fellow student(s) and discuss assignments with them. Writing on a board or shared piece of paper is acceptable during the meeting; however, you should not take any written (electronic or otherwise) record away from the meeting. This applies when the assignment is supposed to be an individual effort or whenever two teams discuss common problems they are each encountering (inter-team collaboration). After the meeting, engage in a half-hour of mind-numbing activity (like watching an episode of the Simpsons), before starting to work on the assignment. This will assure that you can reconstruct what you learned from the meeting, by yourself, using your brain.

The Freedom of Information Rule: To assure that all collaboration is on the level, you must always write the name(s) of your collaborators on your assignment in the beginning of your submission file as a comment.

Computer Science Department Policy on Academic Honesty

As stated in the campus-wide Academic Honesty Policy (AHP), "academic integrity is the foundation of an academic community". Accordingly, the CSE faculty takes this matter very seriously and has embraced a zero tolerance on this matter. The process described in the following establishes the minimum consequences for violations of the AHP in CSE courses, but repercussions may be more severe for egregious violations. The Computer Science Department Policy on Academic Honesty ("CSE Policy" from now onwards), does not substitute the AHP but rather specifies how it will be implemented when students enrolled in classes offered by the Computer Science and Engineering (CSE) department are found in violation of the AHP. In particular, the CSE Policy defines how the CSE faculty implements the "Instructor-Led Process" described in AHP 802.00.A. This policy and the associated processes have been developed in collaboration with the Office of Student Conduct and the School of Engineering and is jointly implemented by the CSE Faculty, the School of Engineering, and the Office of Student Conduct. The CSE Policy has been in effect since the Fall 2019 term.

Preamble: Computer science education relies on a variety of methods to assess students' preparation and learning. The term "assignment" shall be interpreted as any method or process resulting in a grade or

contributing to the final grade for a class. Accordingly, the term “assignment” used in the following includes, but is not limited to: homeworks, quizzes, in-class exams, take-home exams, programming assignments, software projects, and presentations.

Shared Responsibility: Maintaining an environment where academic integrity is valued and enforced requires commitments by both instructors and students. Instructors will specify what type of collaboration is allowed or disallowed for a given assignment, and students should strictly follow the provided guidelines. When in doubt, students should contact the instructor and ask for clarifications.

First Infraction: If it is determined that a student has cheated, plagiarized, or otherwise violated the AHP, the student will receive a 0 (or equivalent grade) for the assignment. As per the AHP, violations will be reported to the Dean of the School of Engineering and the Office of Student Conduct for review of possible violations of the Code of Student Conduct.

Additional Infractions: The School of Engineering keeps a record of all infractions reported by its faculty. If upon receiving a notification it is determined that the student has one or more prior violations of the AHP, the School will inform the instructor who reported the new violation. The additional violation will immediately lead to a failing grade (F) for the course. The student will be informed in writing and will not be allowed to withdraw from the class. According to CSE Policy, students should note that even the first infraction in a class may lead to a failing grade if after reporting it is determined that the student had been previously sanctioned for one or more infractions in other classes. Students will have the right to appeal the instructor's decision as per AHP 802.00.A.

Resources: If in doubt, students are encouraged to seek guidance from the faculty, advisors, and the Office of Student Conduct. Additional resources can be found on:

- <http://studentconduct.ucmerced.edu/>
- <https://ombuds.ucmerced.edu/>
- https://eecs.ucmerced.edu/sites/eecs.ucmerced.edu/files/page/documents/computer_science_department_policy_on_academic_honesty_fall_2019.pdf