

CS 250: Software Engineering

Spring Semester 2021

<http://www.cs.clarku.edu/~jmagee/cs250/>

Class Meetings @ TBA

Mon, Wed 12:00 pm – 1:15pm

John Magee, Instructor

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Always include "CS250" in the subject.

Office hours @ BP 332:

just drop by if I'm in!

Planned hours: TBA

Course Overview

Students consider the life cycle of large software projects, beginning with the elicitation and definition of users' requirements and continuing through software design, documentation, coding, testing and maintenance. Topics include: modularity, coupling, cohesion, transformational and transactional structures and testing strategies. Working in teams, students gain practical experience developing software to solve concrete problems.

Goals of this course include:

- Improve computer programming skills.
- Introduce and practice Software Engineering topics and methodology.
- Gain experience working on a large software project.
- Learn about and use various tools used by software engineers.
- A practical primer for a Software Engineering career.

We will cover the following topics:

- Software Process
- Project Management
- Requirements Analysis
- Software Design
- Implementation
- Testing and Maintenance

IEEE defines Software Engineering as:

1. The application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software, that is, the application of engineering to software.
2. The study of approaches as in (1).

This course will cover both of the above.

Prerequisites

Prerequisites for this course require a grade of C- or better in CSCI 160 – Algorithms and CSCI 170 – Analysis of Programming Languages. This also assumes that you have completed CSCI 121 – Data Structures and MATH 114 – Discrete Mathematics.

LEEP Learning Outcomes

The goal of this course includes advanced level mastery of LEEP Learning Outcomes as follows.

1. **Knowledge of the Natural World and Human Cultures and Societies.**
Demonstrated through understanding of technical fundamental knowledge areas of computer science, applications of computer science to nearly every aspect of modern life, interaction of computing with many different fields, and the ability to communicate and learn from experts in other fields.
2. **Intellectual and Practical skills**
Demonstrated through the ability to design and improve systems using quantitative and qualitative assessments of their functionality, usability, and performance; practice and improvement of communication skills and the ability to communicate effectively to a range of audiences about technical problems and their solutions; the ability to think at multiple levels of detail and abstraction, and apply that to construct and analyze systems; and a recognition of the context of the function of computer systems, including interactions with people and the physical world.
3. **Personal and Social Responsibility**
Demonstrated through the recognition of the social, legal, ethical, and cultural issues inherent in the discipline of computing; an understanding individual and collective responsibility and the possible consequences of failure on real people or the world; a commitment to life-long learning, recognizing that the field of computing advances at a rapid pace; and the ability to manage one's own learning and development, including managing time, priorities, and progress.
4. **Ability to Integrate Knowledge and Skills**
Demonstrated through the recognition of recurring themes and general principles that have broad applications in computing beyond the domains in which they are introduced; an understanding of the fundamental interplay between theory and practice in computing; the ability to solve problems by constructing complex systems, which are analyzed on multiple levels of detail and abstraction; and an appreciation for interdisciplinary aspects of computer science and the application of knowledge toward solving cross-disciplinary problems.
5. **Capacities of Effective Practice**
Demonstrated through the application of students' knowledge toward solving real problems across a variety of domains; the pursuit of an integrative large-scale project that applies knowledge across the curriculum; the effective presentation of projects, ideas, technical problems, and solutions to a variety of audiences; the ability to work effectively in a team and enhance interpersonal skills through collaborative efforts; and the ability to recognize how to apply foundational knowledge to learn and adapt skills throughout a career, as specific technologies change over time.

Grading

The following percentages are tentative and may be changed at my discretion at any time:

Attendance, participation	10%
Homework Assignments	20%
Programming Project	45%
Written Quizzes (4 to 6)	25%

Withdrawing from the Course

If you feel that you want to drop or withdraw from the class, please come talk to me about it as early as possible; I want to help you succeed, but you need to ask for help.

Books

No Required Textbooks, but please obtain an iClicker 2.

Suggested Textbooks:

Software Engineering, Modern Approaches (Second Edition)
by Eric J. Braude and Michael E. Bernstein
Wiley, ISBN-10: 0471692085, ISBN-13: 978-0471692089

Essentials of Software Engineering (Third Edition)
by Frank Tsui, Orlando Karam, Barbara Bernal
Jones & Bartlett

Please obtain one or more of the following:

The following books are available at Goddard Library with a 7 day borrow period.

Code Complete: A Practical Handbook of Software Construction (2nd Edition)
By Steve McConnell

The Pragmatic Programmer: From Journeyman to Master
By Andrew Hunt and David Thomas

Clean Code: A Handbook of Agile Software Craftsmanship
By Robert Martin

The Clean Coder : a code of conduct for professional programmers
By Robert Martin

The Mythical Man-Month: Essays on Software Engineering, Anniversary Edition (2nd Edition)
By Frederick P. Brooks

Beautiful Code: Leading Programmers Explain How They Think
by Andy Oram, Greg Wilson

Other online readings and tutorials will be posted to the schedule page.

Policies and Miscellaneous

The official administrative business of this class will be conducted by email.

Grade questions/disputes, explanation of absence, etc. will be processed via email so that we both have a written record of what was agreed. Feel free to discuss in person but an email follow-up is required for the official record.

Attendance and discussion/asking questions are expected and will be reflected in your grade.

If you must be absent, please email me in advance to let me know why you won't be in class, and to let me know what you will do to keep up with the assignments.

This is not a correspondence course. Inadequate attendance is grounds for a grade of F.

Computer Use Policy

Please do not use class time to work on other homework, play games, check Facebook, or surf the web. Such activities can be distracting to other students. **Assignments are due on the date stated on the homework assignment (to be posted on web).**

- Assignments received within 0-24 hours of the deadline will be accepted with a 10% penalty.
- Assignments received within 24-48 hours of the deadline will be accepted with a 20% penalty.
- Assignments received more than 48 hours past the deadline will not be accepted or graded.

Plan your work accordingly, and work on all assignments as soon as they are given so you can ask questions in class and get assistance early.

Students are responsible for ensuring that assignments are correctly submitted. If you have a question or problem, seek help from course staff immediately.

No special make-up work will be accepted after the end of the semester. Don't even ask.

In the event of a documented major medical problem, a grade of Incomplete will be given pending the submission of complete work. However, make up work "to improve one's grade" will not be accepted.

It is the student's responsibility to retain all papers, quizzes, and exams that have been graded and returned. Should these original documents not be available in the event of a grade dispute, I will need to defer to the own records.

Grades are not negotiable. Don't even ask – just do the work and you'll get the grade you deserve. Of course, please bring any clerical grading errors to my attention by email and I will gladly fix them.

Time Commitment. This is a 4-credit. Each class meeting will require several hours of preparation and additional work outside of class. This course involves a semester-long large-scale project that you should devote significant time towards. You should expect to devote 13-18 hours per week to this course. The workload will vary week-to-week. A minimum of 180 hours of engaged academic time is expected.

Students with Disabilities. Clark University is committed to providing students with documented disabilities equal access to all university programs and facilities. If you have or think you have a disability and require academic accommodations, you must register Student Accessibility Services (SAS), which is located in room 430 on the fourth floor of the Goddard Library. If you have questions about the process, please contact The Director of Accessibility Services. If you are registered with SAS, and qualify for accommodations that you would like to utilize in this course, please request those accommodations through SAS in a timely manner.

Welcoming Class Atmosphere. I strive to make my classroom welcoming and productive for all students. Please let me know what name or pronoun you prefer to use. Please bring to my attention any issues or concerns you have about the classroom atmosphere.

Notice to students: Faculty Members are "Responsible Employees"

As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. I also have a mandatory reporting responsibility related to my role as a responsible employee. I am required to share information regarding sexual misconduct or information about a crime that may have occurred at Clark. Students may speak to someone confidentially by contacting the Center for Counseling and Personal Growth at (508) 793-7678 or our faculty confidential sources: Kathleen Palm Reed, James Cordova, Sasha Adkins, and Andrew Stewart.

Plagiarism, Collaboration, and Collusion

Unless otherwise specified, all CS250 homework assignments and projects are **independent work**.

It is the student's responsibility to know and understand the Clark University Academic Integrity policy, which is within the Academic Advising Handbook (The Blue Book) available at the Academic Advising Center.

In addition to the definition of plagiarism in the handbook, **with respect to CS250, plagiarism is specifically defined to include (but is not limited to) the following:**

- collaboration on the solutions/code you write
- copying any part of someone else's assignment/program, even if you have permission and/or have modified the code
- sharing or giving your assignment/code or even a subset of your assignment/code to another student to review
- reviewing another student's solution (including from past semesters)
- reviewing solutions on the internet

It is my policy to use automatic plagiarism detection software, and suspicious similarities will be uncovered. The University takes acts of cheating and plagiarism very seriously; violators may be suspended or fail the course.

What is acceptable cooperation?

Cooperation is recommended in understanding programming concepts and system features. You are encouraged to discuss the labs, the homework problem statements and expected output, and to seek and receive help with the various tools used in the course.

However, each student must write his or her own solution/code and other deliverables independently.