Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Year: 2025
Course Prefix: Computer Science
Course and Section #: 2450-002
Course Title: Software Engineering I
Credits: 3

Course Description

Introduction to fundamental concepts, philosophies, and trends in Software Engineering. Students will learn principles throughout the software process, from initial phases to final activities, including agile design, software requirements, software analysis, software design, software implementation, software testing, and quality management. This course prepares students to adapt to new situations in the business world.

Students will learn the principles and concepts of the software process, agile design, software requirements, software analysis, software design, software implementation, software testing, and quality management.

Students will apply software engineering principles through case studies and projects to solve real-world problems.

Course Attributes

This course has the following attributes:

☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☐ Elective Core Requirements in Program
☐ Open Elective

Other: *Click here to enter text.*

Instructor Information

Instructor Name: Qudrat E Alahy Ratul

Student Learning Outcomes

- Understand and apply software processes in software development.
- Develop precise, concise, and formal requirements for software systems based on the needs of users and stakeholders.
- Apply analysis, design principles, and patterns while developing software systems using Object-Oriented technology.

- Create UML use case diagrams, use case narratives, and context diagrams to analyze software requirements.
- Create UML class diagrams that model aspects of the domain and software architecture.
- Create UML sequence diagrams and state machines to model system behavior.
- Apply project management methodology in team projects.
- Use simple measurement techniques in software projects.

Course Materials and Texts

I. Engineering: Modern Approaches, Second Edition, ISBN 978-1-4786-3230-6
II. https://softengbook.org

Course Requirements

Course Assignments, Assessments, and Grading Policy
This course is organized into **8 modules**, as follows.

- Module 1: Introduction to Software Engineering and Group Project Details
- Module 2: Software Process and SDLC including Waterfall, Agile, and TDD
- Module 3: Project Management
- Module 4: Requirement Analysis: High-Level and Low-Level including UML
- Module 5: Software Design
- Module 6: Implementation
- Module 7: Testing
- Module 8: Maintenance

The **group project**, comprising **5 milestones** (**40%** of the overall grade), is designed to provide students with hands-on experience in applying software engineering principles. Weekly **homework assignments** (**25%** of the overall grade) are aligned with the modules and consist of a mix of quizzes and coding exercises. The **in-class activity** is **10%** of the overall grade. As part of the group project deliverables, students will incorporate UML diagrams, user stories, and story points, while leveraging software planning tools and source/version control systems. The project will include comprehensive activities such as requirement analysis, design, development of code, UML modeling, documentation, testing, and maintenance to ensure a holistic learning experience.

There is **1 midterm** exam and a **final** exam (each **25%** of the overall grade). Exams are administered in Canvas and are timed. The final exam is comprehensive.

The following grading scale will be used in this class:

A = 94-100	B- = 80-82	D+ = 67-69
A- = 90-93	C+ = 77-79	D = 63-66
B+ = 87-89	C = 73-76	D- = 60-62
B = 83-86	C- = 70-72	E = 0-59

Required or Recommended Reading Assignments

All required readings use chapters from the course text that align with the lecture schedule outlined below.

General Description of the Subject Matter of Each Lecture or Discussion

Week	Module	Topics	Others
Week 1	Module 1	Course introduction, overview of software engineering, and group project details.	
Week 2	Module 2	Software Process and SDLC including Waterfall, Agile, and TDD	
Week 3	Module 2 MLK Jr. Day (No Class Monday)	Agile and Scrum	Project Milestone 1
Week 4	Module 3	Requirement Analysis: High-Level, UML	
Week 5	Module 4	Requirement Analysis: Low-Level	Project Milestone 2
Week 6	Module 5	Software Design principles, patterns	
Week 7	Module 5 Presidents Day (No Class Monday)	Design Patterns	Project Milestone 3
Week 8	Module 5	Design Patterns, Clean code	
Week 9		Review and Midterm	Midterm
Week 10	Spring Break		
Week 11	Module 5	Software Architecture	Project Milestone 4
Week 12	Module 6	Implementation, coding best practices, and clean code	
Week 13	Module 7	Testing	Project Milestone 5
Week 14	Module 8	Maintenance: Devops, Refactoring	
Week 15		Modern software development concepts and review	
Week 16	Project Presentation	Project Presentation	Project: Final feedback
Week 17		Final Exams	Final Exam,

Week	Module	Topics	Others
			Final Project Submission

Required Course Syllabus Statements

Generative AI
ChatGPT (and similar Tools) in This Course
Use ChatGPT as a learning assistant, not as a crutch. If you use it, cite it at the top of your code. You are responsible to make sure that any code or content does what it is supposed to do and says what you want it to say. Don't accept anything it generates at face value without checking it critically. These days potential employers will expect you to know how to use tools like ChatGPT to generate code, so it is a skill we need to teach you. If it helps you learn some things faster, GREAT because we can spend class time on more interesting topics. Just remember: If you REALLY want to be good, work for it.

Using Remote Testing Software
☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities
Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity
At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that

produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX

Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation

UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.
To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.