



Course Name: Software Engineering I

Course Number: CS 361

Credits: 4

General Information:

Instructor: Ali Aburas, aburasa@oregonstate.edu

Office Hours: TR 11:00am -12:00pm, or by appointment

Office: KEC 3119

Course Description:

Fundamentals of software engineering using a group project as the basic vehicle. Topics covered include managing complexity, requirements specification, architectural and detailed design, testing and analysis, software process, and tools and environments.

Overview:

Our world is full of problems such as war, poverty, addiction, and pollution. Software has played and will continue to play a vital role in promoting peace, education, health, and the renewal of our planet. But software doesn't just grow on trees. Somebody has to carefully design and create the software in a way that actually addresses the problem without making it worse, without incurring excessive costs, and without creating troublesome new problems. That's called "engineering". This course will give you the skills needed to analyse big problems, discover the requirements for a solution, design a solution, and manage the solution's implementation.

Prerequisites: CS 261 [C] College Limitations: +16 (Engr)

Textbook:

There is no required textbook.

Here are some useful books on software engineering



[Pfleeger, Shari Lawrence, *Software Engineering Theory and Practice*, fourth edition. Prentice Hall 2009.](#)

[Sommerville, Ian, *Software Engineering*, Ninth Edition. Addison Wesley, 2010.](#)

[Grady Booch, Robert A. Maksimchuk, Michael W. Engel, and Bobbi J. Young, *Object-Oriented Analysis and Design with Applications*, third edition. Benjamin/Cummings 2007](#)

Learning Objectives:

After the completion of the course, students should be able to

- Process: Select the most appropriate software process model to use in a particular situation.
- Requirements: Synthesize requirements for a realistic software system and write a requirements specification document.
- Documents: Represent requirements, designs, and systems using semi-formal notations such as UML diagram.
- Design: Design software systems at an architectural level and at lower levels.
- Validate: Validate designs and adjust the specification or design.
- Cost and schedule: Estimate the cost and developing a schedule for a programming project.
- Team: Participate effectively in a team environment.

Topics Covered:

- Software Engineering Processes
- Requirements Elicitation
- Diagram Notations
- Evaluating Requirements
- Software Architecture
- Software Architecture Decomposition
- Software Architecture Evaluation



- Object Oriented Design
- Object Oriented Design Patterns
- Agile Process Overview
- Agile Teamwork
- Pair Programming
- Effort Estimation
- Project Scheduling
- Software Testing
- Refactoring Professionalism

Turning in coursework:

You will turn in all coursework items through **Canvas** and **GitHub** before 23:59 (Pacific Time Zone) on the date they are due (**generally Sunday**), otherwise it will be marked late.

Grade Policy:

- Quizzes: 10%
- Course Project: 70%
- Final exam: 20%

Weighting of Scores:

The scores that you receive on the various tasks in the class will be weighted as follows:

Quizzes - 10%

There will be 3-4 quizzes to be taken over the course.

Course Project - 70%

The main portion of a student's grade in this course is the course project. The goal of the course project is to develop a software product and provide you with hands-on software engineering experience, involving **a team of 4-5 students**. You will design and develop your product from the ground up in 10 weeks. Students



will organize into groups and choose to implement a project that is (1) relevant to the materials discussed in class, (2) requires a significant programming effort from all team members, and (3) unique (i.e., two groups may not choose the same project topic).

Each project is comprised of four tasks that are due at different times during the term

1) Vision Statement (Project Proposal) - 10%

- The vision statement must be completed in groups of 2.
- The vision statement consists of
 - A description of a problem. Examples: poverty, hunger, addiction, etc.
 - A few pages about an idea for a solution. Examples: a web application, mobile application, etc.
- Each group will present their project topic to the class
- Each group will submit their vision statement for voting.
- Every student votes for interesting visions.
- The vision statements obtaining the most votes will be used to form groups.
- The authors of the vision statements assigned to each group are the customers for each project. They must approve every aspect of the design and provide feedback to implement their vision in an application. They will receive **extra credit** for directing the group.
- If a vision statement author does not have the time for the extra responsibilities then another vision statement will be assigned. You must inform the instructor immediately on announcement of the voting if you do not want your vision used. This in no way affects your grade.

2) Casting votes on vision statement –5%

- Each student will vote for the vision statement individually.
- Voting is done via a Canvas poll.

3) Projects - 45%

- The project is to work on one of the classmates' envisioned solutions (proposed in the vision statement).
- The project will be done in teams with 4 to 5 members.
- The instructor assigns students to teams and assigns projects to teams.



- The projects are divided into different parts (i.e., assignments), each of which ends in a milestone. At each milestone, the team submits a written report.
- Every student must make contribution every week. When your team submits each homework, you must also indicate what each team member contributed. Individual team members will usually get approximately the same grade, but individual team member grades may be reduced depending on the quality and quantity of the contribution.
- For the second part of the project you will write code and real tests and submit the code. The idea is that, with the approval of the customer, each pair would select some feature and implement that and then write a test to check that particular implementation. You will also have to perform integration testing/overall feature integration. Grading will NOT be based on how many features/functionality you have implemented, but whatever the number of features you have implemented, did you write test case(s) for them and are those actually well thought-out tests (because it's possible to write a huge number of trivial tests that actually don't add any value). Whatever the number of features you decide to implement must work correctly and has to be substantial enough (decided by the grader) according to the number of people in the group.
- Please submit **ONLY one submission per group**.

4) Team member evaluations –10%

- Each student will do the evaluation individually.
- All team members will evaluate all other team members on
 - Participation in group meetings.
 - Timeliness in deliverables.
 - Giving feedback.
- The evaluations will include the customers. They are the authors of the vision statement. They must ensure that your design satisfies their vision of the application!
- Team member evaluation may impact the grade for the project.



Final Exam -20%

The final exam

- Will be closed book (no notes, no calculator or text editor are allowed).
- Will be **110 minutes** long.
- Covers material from lectures.
- Date and Time (TBA)

Late Policy:

Late work is not accepted without prior arrangement for any group work, individual work and the final.

Grading Scale

Grade	Average
A	>92
A-	>90 - 92
B+	>87 - 90
B	>83 - 87
B-	>80 - 83
C+	>77 - 80
C	>73 - 77*
C-	>70 - 73
D+	>67 - 70
D	>63 - 67
D-	>60 - 63
F	<=60

*** REMINDER: A passing grade for core classes in CS is a C or above.**



If you have a question about your grade, you must contact the grader through EMAIL within **ONE WEEK** of receiving your grade.

Technical environment:

You are encouraged to choose your own toolset and use whatever is right for your particular project. Your whole team should work together to choose, understand, and use the tools. However, we require that you use a distributed version control system, such as [Git](#).

Academic Integrity:

Students are expected to comply with all regulations pertaining to academic honesty. For further information, visit [Student Conduct and Community Standards](#), or contact the office of Student Conduct and Mediation at 541-737-3656. OAR 576-015-0020 (2) Academic or Scholarly Dishonesty:

- a) Academic or Scholarly Dishonesty is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another.
- b) It includes:
 - i) **CHEATING** - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information. This includes but is not limited to unauthorized copying or collaboration on a test or assignment, using prohibited materials and texts, any misuse of an electronic device, or using any deceptive means to gain academic credit.
 - ii) **FABRICATION** - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.
 - iii) **ASSISTING** - helping another commit an act of academic dishonesty. This includes but is not limited to paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, taking a test/doing an assignment for someone else by any means, including misuse of an electronic device. It is a violation of Oregon state law to create and



offer to sell part or all of an educational assignment to another person (ORS 165.114).

- iv) **TAMPERING** - altering or interfering with evaluation instruments or documents.
- v) **PLAGIARISM** - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.
- c) Academic Dishonesty cases are handled initially by the academic units, following the process outlined in the University's Academic Dishonesty Report Form, and will also be referred to SCCS for action under these rules.

Students with Disabilities:

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Technical Assistance — If you experience computer difficulties, need help downloading a browser or plug-in, assistance logging into the course, contact the OSU Help Desk for assistance. You can call (541) 737-3474, email osuhelpdesk@oregonstate.edu or visit the OSU Computer Helpdesk online.

OSU Student Evaluation of Teaching:

Course evaluation results are extremely important and are used to help me improve this course and the learning experience of future students. Results from the 19 multiple choice questions are tabulated anonymously and go directly to instructors and department heads. Student comments on the open-ended questions are compiled and confidentially forwarded to each instructor, per OSU procedures. The online Student Evaluation of Teaching form will be available toward the end



of each term, and you will be sent instructions via ONID by the Office of Academic Programs, Assessment, and Accreditation. You will log in to “Student Online Services” to respond to the online questionnaire. The results on the form are anonymous and are not tabulated until after grades are posted.