CSCI 310: Software Engineering
Units: 4
Fall 2018 – Monday, Wednesday—10:00am-11:50am

Location: SGM 101

Instructor:

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Course Assistants:

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Course Description

Introduction to the software engineering process and software lifecycle. Covers project management, requirements, architecture, design, implementation, testing, and maintenance phase activities in individual and team based projects.

Learning Objectives

Students will gain an understanding of the foundational methods and techniques of professional software development, and learn how to leverage them in practical settings. Major learning objectives are:

1. Understand the importance of requirements: make sure your software does what the customer wants it to do
2. Understand the basic object-oriented (OO) design principles: make sure your software has flexibility
3. Understand the basic design patterns: make sure your software is maintainable and reusable
4. Understand the software processes: make sure you work efficiently and communicate well with others

Prerequisites

CSCI 201 (Principles of Software Development)
CSCI 104 (Data Structures and Object Oriented Design)
CSCI 103 (Introduction to Programming)

Textbook and Supplementary Readings

Textbook:
- Software Engineering (10th Edition), Ian Sommerville, Pearson, 2015 (required)

Supplementary Reading:
- Head First Object-Oriented Analysis and Design, McLaughlin, Pollice and West, O'Reilly, 2006 (option)
- Head First Software Development, Pilone and Miles, O'Reilly, 2008 (optional)
- Head First Design Patterns, Freeman and Robson, O'Reilly, 2014 (optional)
- Head First Android Development, Griffiths and Griffiths, O'Reilly, 2015 (optional)

Assignments and Examinations

The grades will be based on the completion of quizzes, two examinations, an individual software development project, and a team-based software development project.

- **Quizzes**: Unannounced quizzes will access the student's understanding of the materials covered in the lectures.

- **Examination #1**: It will assess the student's understanding of materials covered in the first half of the semester.

- **Examination #2**: It will assess the student's understanding of materials covered in the second half, although the student is still expected to show in-depth understanding of topics already covered by the first exam.

- **Project #1**: This individual project will develop the student's ability to use professional software tools and adopt test-driven development (TDD).

- **Project #2**: This team-based project will develop the student's ability to collaborate with others and adopt the iterative development process. The project will have 7 exercises, thus resulting in 7 deliverables. The last three exercises, in particular, will be "sprints" intended to build on the solutions produced in the first four exercises.

Grading Breakdown

Assignment	% of Grade
Examination #1	15%
Examination #2	15%
Quizzes	15%
Individual Project	10%
Team-based Project	45%
- Deliverable #1 - 10% (requirements) - Deliverable #2 - 10% (design) - Deliverable #3 - 5% (implementation) - Deliverable #4 - 5% (testing) - Deliverable #5 - 5% (sprint 1) - Deliverable #6 - 5% (sprint 2) - Deliverable #7 - 5% (sprint 3)	
TOTAL	**100%**

While the second project is a team exercise, each student will receive an individual grade, based on not only the team's performance but also the student's personal contribution; thus, an individual's grade may deviate from the team's grade.

No students are allowed to miss either exam. Failure to take an exam during its scheduled time will result in a grade of zero on that exam.

Students are allowed to miss up to two quizzes during the entire semester without a penalty. This is because, for all students, two of the lowest-graded quizzes will be dropped when computing the final grade.

Additional Policies

Late assignments will be accepted up to 24 hours after the announced deadline, with a penalty of 20%. Assignments received more than 24 hours late will receive a grade of 0.

If you feel that an error has been made in grading, please notify the TA/grader within one week after the material is returned. For exams, please present a short written appeal to the instructor.

Course Schedule (tentative)

Week	Date	Topic	Required Reading (Sommerville)	Supplementary Reading (Head First)	Homework
1	08/20	Introduction	Ch.1-2		
	08/22	Tools: configuration management	Ch.25	Ch.6-8	
2	08/27	Tools: build and unit testing			
	08/29	TDD: Test-driven development			Project 1
3	09/03	Labor Day Holiday – NO CLASS			
	09/05	Iterative development I	Ch.3	Ch. 1-5	
4	09/10	Iterative development II			
	09/12	Iterative development III		Ch. 9-11	
5	09/17	Requirements	Ch.4 and Ch.5		Project 2.1
	09/19	Project Introduction: Android I			
6	09/24	Project Introduction: Android II			
	09/26	Architectural design	Ch.6		Project 2.2
7	10/01	Detailed design	Ch.7		
	10/03	Design Pattern I -- Review for Exam 1			
8	10/08	**Exam 1**			Project 2.3
	10/10	Guest Lecture			
9	10/15	Project Meeting: Android III			
	10/17	Testing I			Project 2.4
10	10/22	Testing II			
	10/24	Testing III			
11	10/29	OO Design Principles I			Project 2.5
	10/31	OO Design Principles II			
12	11/05	Design Pattern II	Ch.8		
	11/07	Conference Travel (FSE 11/6-8) -- NO CLASS			Project 2.6
13	11/12	Design Pattern III			
	11/14	Dynamic Analysis			
14	11/19	Static Bug Detection			Project 2.7
	11/21	Thanksgiving Holiday – NO CLASS			
15	11/26	Formal Verification			
	11/28	Review for Exam 2			
16	12/03	Study Day – NO CLASS			Project 2 due
	12/10	**Exam 2**			

Academic Conduct

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" https://policy.usc.edu/student/scampus/part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Discrimination, sexual assault, intimate partner violence, stalking, and harassment are prohibited by the university. You are encouraged to report all incidents to the *Office of Equity and Diversity/Title IX Office* http://equity.usc.edu and/or to the *Department of Public Safety* http://dps.usc.edu. This is important for the health and safety of the whole USC community. Faculty and staff must report any information regarding an incident to the Title IX Coordinator who will provide outreach and information to the affected party. The sexual assault resource center webpage http://sarc.usc.edu fully describes reporting options. Relationship and Sexual Violence Services https://engemannshc.usc.edu/rsvp provides 24/7 confidential support.

Support Systems

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* http://ali.usc.edu, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://dsp.usc.edu provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* http://emergency.usc.edu will provide safety and other updates, including ways in which instruction will be continued by means of Blackboard, teleconferencing, and other technology.