

CSCI 310: Software Engineering Units: 4 Fall 2019 – 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:

• <u>Software Engineering</u> (10<sup>th</sup> Edition), Ian Sommerville, Pearson, 2015 (required) Supplementary Reading:

- Head First Software Development, Pilone and Miles, O'Reilly, 2008 (optional)
- Head First Design Patterns, Freeman and Robson, O'Reilly, 2014 (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	10%	
Individual Project	15%	
Team-based Project	45%	
<ul> <li>Deliverable #1 - 10% (requirements)</li> </ul>		
• Deliverable #2 - 10% (design)		
• Deliverable #3 - 10% (implementation)		
<ul> <li>Deliverable #4 - 10% (testing)</li> </ul>		
<ul> <li>Deliverable #5 - 5% (sprint)</li> </ul>		
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 three (3) quizzes during the entire semester without a penalty. This is because, for all students, three 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. For exams, please notify the instructor. After one week, regrading will no longer be allowed.

# Course Schedule (tentative)

Week	Date	Торіс	Textbook (Sommerville)	Supplement (Head First)	Homework
1	08/26	Introduction	Ch.1-2		
	08/28	Tools: configuration management	Ch. 25	Ch.6-8	
2	09/02	NO CLASS – Labor Day Holiday			
	09/04	Tools: build and unit testing			
3	09/09	TDD: Test-driven development			Project 1
	09/11	Iterative development I	Ch. 3	Ch. 1-5	
4	09/16	Iterative development II			
	09/18	Iterative development III		Ch. 9-11	
5	09/23	Requirements	Ch. 4-5		
	09/25	Project Introduction: Android I			Project 2.1
6	09/30	Project Introduction: Android II			
	10/02	Architectural design			
7	10/07	Detailed design	Ch.6		Project 2.2
	10/09	Design Pattern I	Ch.7		
8	10/14	Review for Exam 1			
	10/16	<b>Exam 1</b> – in the lecture classroom at 10 -11:50AM		Recess 17-18	Project 2.3
9	10/21	Project Meeting I	Ch.7		
	10/23	OO Design Principles I			
10	10/28	Project Meeting II			
	10/30	OO Design Principles II			
11	11/04	Testing I			
	11/06	Testing II			Project 2.4
12	11/11	Testing III			
	11/13	Design Pattern II			
13	11/18	Design Pattern III	Ch.8		
	11/20	Dynamic Program Analysis			
14	11/25	Static Program Analysis			Project 2.5
	11/27	NO CLASS – Thanksgiving Holiday (11/27-12/01)			
15	12/02	Formal Verification			
	12/04	Wrap Up Review for Exam 2			
16	12/09	NO CLASS – Study Day			Project 2 due
	12/11	Exam 2 in the lecture classroom at 11AM-1PM			

# **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" <u>https://policy.usc.edu/student/scampus/part-b</u>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <u>http://policy.usc.edu/scientific-misconduct</u>.

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* <u>http://equity.usc.edu</u> and/or to the *Department of Public Safety* <u>http://dps.usc.edu</u>. 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 <u>http://sarc.usc.edu</u> fully describes reporting options. Relationship and Sexual Violence Services <u>https://engemannshc.usc.edu/rsvp</u> 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* <u>http://ali.usc.edu</u>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* <u>http://dsp.usc.edu</u> 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* <u>http://emergency.usc.edu</u> will provide safety and other updates, including ways in which instruction will be continued by means of Blackboard, teleconferencing, and other technology.