Winter 2017

SE 333/433: Software Testing and Quality Assurance

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Office Hours: Wednesday 4:30pm-5:15PM
Thursday 5:45-6:30PM

Course Objectives:

To help students gain an understanding of principles and issues in software test and analysis. Students will become familiar with various levels of testing such as unit, integration, system, performance and stress testing and develop an understanding of test lifecycle planning, test design & coverage analysis, test case selection and complexity measurements. The specific topics covered by the course is shown under the schedule section at the bottom of this document.

Class Schedule:

Wednesday from 5.45pm-9.00pm Daley Building Room 801

Homework:

Nine homeworks will be assigned as shown in the class schedule. Late work will NOT be accepted after the deadline without a doctor's note. Please note that (1) homework assignments and deadline dates will NOT change, and (2) you are expected to complete all homeworks.

Reading List:

- (Optional) Software Testing and Analysis: Process, Principles and Techniques, by Mauro Pezze, and Michal Young, Wiley. ISBN-10: 0471455938 ISBN-13: 978-0471455936
- (Optional) Introduction to Software Testing, by Paul Ammann and Jeff Ouffutt. ISBN-13: 978-0521880381 ISBN-10: 0521880386
- (Optional) The Art of Software Testing, Second Edition by Glenford J. Myers et. al. Digital copy available in library.
- (Optional) Software Engineering: A Practitioner's Approach, Roger S Pressman, McGraw-Hill, Chapters 14-20, 23.

Grades:

- Homework: Nine assignments
  - SE333- (50%)
  - SE433- (35%)
- Attendance: (10%)
  - Attendance is required for this course. Attending lectures help you to better understand the home works.
  - Attend and participate in class. Sign the attendance sheet which will be made available starting in Week 2. If you skip the occasional lecture make sure you complete the class activity for that week.
- Exams:
  - Midterm (20%)
  - Final (20%)
- Project (15%) - **SE433 only**

Graduate students are expected to do research on well-known software failure cases which I will assign during the course. Each graduate student requires to present his/her findings in form of a 15-20 minutes in class presentations (online students must record and submit high quality videos of their presentation).

There will be **no extra credit**, so please make sure to do all assignments and keep up with the class.

Prerequisites:

The following course is listed as a prerequisite.
Data Structures II (CSC301 or CSC403 or CSC383 or CSC393) or Object-Oriented Modeling (SE 430) Proficient in programming and data structures. Assignments will use Java. Familiar with object-oriented modeling and principles. Familiar with software development processes.

Schedule:

You can see a draft for schedule below. The lecture topics from weeks 4 onwards are still flexible. The schedule will be updated on D2L.

		Wednseday		**Reading**	**Assignments**
1	Jan	3rd	Introduction to Software Testing, Overview of Testing Techniques	Pezze: Chapter 1-4	ClassActivity1 Assignment1:Triangle Assigned
2		10th	Software Quality, Non Functional Requirements, Levels of Granularity of Testing	Pezze: Chapter 1-4	**Assignment1 part 1 due** Assignment2: Software Quality Assigned Case Study 1 Assignment (HealthCare.gov)
3		17th	Unit Testing, Junit Part I, Tips on Testing	Pezze: Chapter 17	**Assignment1 part 2 due** **Assignment2 due** Assignment3: Junit & Eclipse Assigned Case Study 2 Assignment
4		24tg	Black Box Testing Part I, Junit Part II	Pezze: Chapter 9-10	**Assignment3 due** Assignment4: Junit & Parametrized Tests Assigned Case Study 3 Assignment (Knight Capital)
5		31th	Black Box Testing Part II Junit + Ant	Pezze: Chapter 10	**Assignment4 due** Assignment5: Black Box Testing Assigned Case Study 4 Assignment
6	Feb	7th	**Midterm Exam Participation Mandatory**		

7		14th	Combinatorial Testing, Programs Models and Graphs, Structural Testing	Pezze: Chapter 11.1, 11.3-11.4 5.1-5.3 12	**Assignment5 due** Assignment6: Junit & Ant Assigned Case Study 5 Assignment (Airbus A320)
8		21th	Static Analysis and Inspection	Pezze: Chapter 18, 23	**Assignment6 due** Assignment7: BlakBox Testing Assigned Case Study 7 Assignment
9		28th	Integration & System Testing	Pezze: Chapter 21.1, 21.2, 22	**Assignment7 due** Assignment8: White Box Testing Assigned Case Study 8 Assignment
10	Mar	7th	Test Plans & Review	Pezze: Chapter 20, 24	**Assignment8 due** Assignment9: Code Coverage Assigned
		14th	**FinalExam 6:00-8:15PM**		**Assignment9 due**

SE-350 (Session 401)

NOTE: Specific topics from Week 4 on may be rearranged.

		Thursday		Tuesday		Reading	Assignments
1	Sep	7th	Course Introduction ***Java Review*** : Basic UML Inheritence/Ovrride Lecture1a.pdf	12th	***Design Pattern:*** Strategy ***Java Review:*** Java Loops & Iterators Lecture1b.pdf Activity Sheet #1	Horstmann: Chapter 1 Headfirst: Chapter 1	
2		14th	**Lab # 1: Strategy Pattern (Lab1.pdf)- WorldPopulation** **Homework 1: "Battleships" assigned**	19th	***Design Pattern:*** Observer ***Java Review:*** Date Class Lecture 2b.pdf Activity Sheet # 2	Horstmann: Chapter 3 Headfirst: Chapter 2	
3		21st	Introduction to JavaFX Lecture 3a.pdf	26th	**Lab #2: Java BASIC GUIs** **Homework 2: "Christopher Columbus" assigned**	Horstmann: Chapter 4 Horstmann: Chapter 9 (no synchronization)	**Monday 25th** @Midnight (Homework 1 due) 10%
4	Oct	28th	Programming by Contract Lecture 4a.pdf Hands-on Design Activity Activity Sheet #3	3rd	***Design Pattern:*** Composite ***Case Study*** : Fragile Base-Class Lecture 4b.pdf	Headfirst: Chapter 9	
5		5th	SOLID Principles Lecture 4a.pdf **Homework 3: Composite assigned** (Read Horstmann Chapter 3)	10th	**Lab # 3: Handling Events** **Mouse Events** **(Read Horstmann Chapter 2)**		**Monday 9th** @Midnight (Homework 2 due) 10%
6		12th	**Midterm Exam** **Participation Mandatory**	17th	***Design Pattern:*** Adaptive Patterns (Decorator, Façade, Adapter) I/O Streams (Serialization/Deserialization)	Headfirst: Chapter 3 (Decorator)	**Midterm on 12th** 15%
7		19th	***Design Pattern:*** Factory Method and Abstract Factory **Final Project Assigned**	24th	**Lab #4: Practice with Factory Mehod & other patterns we've learned, MVC**	Headfirst: Chapter 4 (Factory patterns) Horstmann: Chapter 5	**Sunday 22nd** @Midnight (Homework 3 due) 10%
8		26th	***Design Pattern:*** Singleton Anonymous Classes	31th	***Design Pattern:*** Command	HeadFirst: Chapter 5 (Singleton), Chapter 6 (Command)	**Sunday 29th** Project GUI & UML Design 5%
9	Nov	2nd	***Design Pattern:*** Visitor	7th	***Design Pattern:*** State Software Development Processes	HeadFirst: Chapter 9 (Collections) Horstmann: Chapter 2 (SDP)	
10		9th	***Design Pattern:*** Template General review of patterns	14th	**Game Jam** **Participation Mandatory**	HeadFirst: Chapter 8 (Template)	Project presentation 5%
		16th	**Final Exam** **11:30-1:45** **Participation Mandatory**				**Sunday 19th** @Midnight (Final Project due) 20% Final Exam: 20%

* In addition to the assigned readings, some examples in the lecture slides will be taken from Horstmann and will be referenced in the slides.
* The remaining 5% of the grade is the attendance grade.