CSC493

Selected Topics in CS – Software Testing

TTh, 1p - 2:50p, MCT158

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Office Location: MCT150
Office Hours: See on D2L

The content of this schedule may change during the semester.

Course Description:
This course provides concepts and techniques for software testing and assuring software quality. Topics include software verification, validation, coverage criteria, graph coverage, logic coverage, syntax coverage, mutation testing and testing process. Students
Prerequisite(s): C or better in CSC111 or ENGR120.
Credit Hours: 4

Text(s): *Introduction to Software Testing*, 2nd Edition

Author(s): Ammann, and Offutt; **ISBN-10:** 1107172012

Website: Most course contents will be uploaded to D2L

Grade Distribution:

Project	30%
Labs	20%
Exam1	15%
Exam2	15%
Final Exam	20%
Extra Credits	0 – 5%

Letter Grade Distribution:

>= 93.00	A	70.00 - 76.99	C
90.00 - 92.99	A-	60.00 - 69.99	D
87.00 - 89.99	B+	<= 59.99	F
83.00 - 86.99	B		
80.00 - 82.99	B-		
77.00 - 79.99	C+		

Course Policies:

- **General**
  - Slides will be released as notes on D2L after lectures.
  - You are expected to take notes. Some contents in the slides and written on the board are not from the textbook.
  - Most materials of the course will be managed on D2L.
- **Grades**
  - Grades in the **C** range represent performance that **meets expectations**; Grades in the **B** range represent performance that is **substantially better** than the expectations; Grades in the **A** range represent work that is **excellent**.
  - Grades will be maintained on D2L. Students are responsible for tracking their progress by referring to the online gradebook.
  - You can dispute your grade for a certain item within **1** week after the grade is released. For example, you cannot dispute your grade of the first homework at the end of the semester.
- **Attendance and Absences**
  - Students must provide valid reasons for excused absences. Students must present copies of orders in the case of military training/operations.
  - Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to get all missing notes or materials.

Academic Honesty Policy Summary:
Those students found violating Shippensburgs academic dishonesty policy [1] will be dealt with on a case by case basis. Minimal punishment should it be a first offense is a zero for the assignment and signing a form admitting to the offense [2]. Second offenses are handled directly by the office for the Dean of Students. See additional information about academic Dishonesty within the Computer Science Department[3].

[1] http://www.ship.edu/catalog/HTML/ugrad09-11/986.htm
[2] http://www.ship.edu/espfor/faculty/dishonesty.pdf
[3] https://web.cs.ship.edu/media/2012_AcademicDishonestyPolicy.pdf

Tentative Course Outline:
The weekly coverage might change as it depends on the progress of the class. The students will be advised when to read the corresponding material.

Week	Lecture	Reading Assignment
Week 1	Overview JUnit	Ch1, Ch4.1 Ch3.3
Week 2	Proof, Check and Testing **Lab 1**: A Java Property Checker	 Handout
Week 3	Coverage Criteria, Test Requirement, Coverage Input Space Partitioning	Ch5.1 Ch6.1
Week 4	Input Space Partitioning Lab: Alloy	Ch6.2, 6.4 Handout
Week 5	Graph Coverage (graph basics) Graph Coverage	Ch7.1 Ch7.2.1, 7.2.2
Week 6	**Lab 2**: Using Jacoco **Exam 1**	
Week 7	Data Flow Data Flow Analysis	Ch7.2.3 Handout
Week 8	Logic Coverage PC, CC, ACC variants	Ch8.1
Week 9	Grammar-Based Testing Mutation Analysis **Lab 3**: Mutation Game	Ch9.1 Ch9.2 Handout
Week 10	Test Oracles **Lab 4**: Oracle Visualization	Ch14, Paper: Checked Coverage Handout
Week 11	Abstract Data Structure Abstract Function, Representation Invariant Testing OOP	Handout Ch9.3, Handout
Week 12	Project: Creating Your Own Criterion **Exam 2**	Paper: Coverage Criteria for Functional Languages
Week 13	Integration Regression	Ch12 Ch13
Week 14	Work on project	Paper: Test Dependency
Week 15	Project Presentation	
Final	Final Exam	