COMP 5800 SOFTWARE TESTING (3 credit hours)

Elmira College

SPRING 2025

Required Text:
Pressman, R. S. ***Software Engineering: a Practitioner's Approach***, 7th edn: McGraw-Hill 2009.

Pre-requisites: COMP 2036 Object Oriented Programming

Course Description
This course is designed to provide students with a comprehensive understanding of the critical processes involved in ensuring the reliability and effectiveness of software systems through rigorous testing and quality assurance methodologies. The course commences with an in-depth exploration of various testing methods and procedures, equipping students with the foundational knowledge required to identify and rectify potential software defects. Students will learn about the intricacies of software validation and verification, which are crucial steps in confirming that the software meets its intended specifications and functions as expected.

Course Objectives and Goals

- Equip students with a solid understanding of the fundamental concepts, principles, and importance of software testing within the software development lifecycle.
- Enable students to master a variety of testing techniques, including black-box, white-box, and gray-box testing, and to apply these techniques effectively to develop comprehensive test cases and test suites.
- Provide students with hands-on experience using industry-standard testing tools and frameworks, and teach them how to integrate these tools into automated testing environments and CI/CD pipelines.
- Develop students' abilities to perform both static and dynamic analysis of software, using code coverage tools to assess the effectiveness of their testing efforts and identify areas for improvement.
- Teach students how to plan, organize, and manage the software testing process, including the creation of test plans, documentation of test cases, and reporting of test results.

Evaluation of Performance
Your grade will be based upon your performance on exams, assignments, and participation.

4 Assignments	20%
6 Labs	25%
2 Quizzes	10%
Midterm Exam	15%

Final Exam	30%
Total	100%

Grades will be assigned as follows:

A	93% and above	B-	80 - 82%	D+	67 - 69%
A-	90 - 92%	C+	77 - 79%	D	63 - 66%
B+	87 - 89%	C	73 - 76%	D-	60 - 62%
B	83 - 86%	C-	70 - 72%	F	59% or below

Withdrawal Policy: Please see Elmira College Bulletin for information on this policy.

Academic Honesty: Please read the section on Academic Honesty in the **Code of Conduct**. Briefly, academic dishonesty includes: cheating, fabrication, facilitating academic dishonesty, and plagiarism. Ask if you have any questions on whether something constitutes as academic dishonesty. All work must be original and new. Past assignments from current or other courses will not be accepted. Academic dishonesty will not be tolerated. It will result in zero on the assignment, and a report will be filed with the school. Continued practice will result in failure of the class. Institutional penalties may also apply with repeated acts of academic honesty.

Student Responsibility:

- It is your responsibility to keep track of assignments and due dates.
- You should ask questions concerning assignments and lectures, if you need any clarifications.
- If you are struggling in class, have concerns, and/or unsure about expectations, please stop by during office hours or make an appointment for another time.

Tentative Schedule of Topics

Topic	Materials	Tasks & Evaluations
Introduction to Software Testing	Chapter 1	
Test Automation and Exception Handling	Chapter 2	Assignment 1
Advanced Test Automation	Chapter 3	Lab 1
Input Space Partitioning	Chapter 4	Quiz 1
Graph-Based and Logic-Based Testing	Chapter 5	
Syntax-Based Testing	Chapter 6	Lab 2
Random Testing	Chapter 7	Assignment 2
Integration and System Testing	Chapter 8	Lab 3
Reviews and Quality Assurance	Chapter 9	
Mocks, Stubs, and Spies with Mockito	Chapter 10	Midterm Exam
Risk Management	Chapter 11	Lab 4
Formal Methods Introduction	Chapter 12	
Program Verification	Chapter 13	Assignment 3
Program Specification with Alloy	Chapter 14	Quiz 2
Advanced Alloy Specifications	Chapter 15	Lab 5
Performance Testing	Chapter 16	Assignment 4
Security Testing	Chapter 17	Lab 6

Usability Testing	Chapter 18	
Continuous Integration and Testing	Chapter 19	Final Exam