Competencies / Learning Outcomes: At the conclusion of this course, the student will have demonstrated the following competencies:

1. Fundamentals of testing and testing throughout the software life cycle (Chapters 1 – 2)
    - Explain why testing is necessary and support that explanation with examples and evidence
    - Discuss how testing supports quality and contrast defects and symptoms
    - Relate how testing finds and prevents defects
    - Explain the fundamental principles of testing
    - Describe the fundamental test processes
    - Explain the psychology of testing and how people influence testing success
    - Explain and contrast the mindset of testers and programmers and why they often conflict
    - Explain the relationship between development and testing within a development life cycle
    - Relate the typical levels of testing with respect to their major objectives
    - Identify which persons perform the testing activities at various test levels (
    - Relate the four major types of test (functional, non-functional, structural and change-related) and show concrete examples for each
    - Compare maintenance testing with testing new applications
    - Identify triggers and reasons for maintenance testing
    - Demonstrate an understanding of software testing terminology

2. Labs 1 - 3
    - Create and execute a test plan, including test cases, to verify the correctness of documentation
    - Prepare a test summary report, and bug reports if necessary
    - Create and execute a test plan, including test cases, to evaluate compliance with specifications
    - Prepare a test summary report, and bug reports if necessary
    - Experiment with internet loading to create and execute a test plan that evaluates internet speed under various loads
    - Analyze and summarize the results of the experiment

3. Static techniques and test design techniques (Chapters 3 – 4)
    - Explain the importance and advantages of static testing
    - Contrast the difference between static testing and dynamic testing
    - Compare the differences between formal and informal reviews
    - Explain the factors for successful performance of reviews
    - Differentiate objectives of static analysis from static and dynamic testing
    - Describe the main features of static analysis
    - Differentiate between a test condition, a test case and a test procedure
    - Explain why both specification-based and experience-based testing approaches are useful
    - Write test cases from software models using equivalence partitioning, boundary value analysis, decision tables and state transition diagrams
    - Describe the concept and importance of code coverage

- Categorize the reasons for writing test cases based on intuition, experience and knowledge about common defects
- List factors that influence selection of test techniques
- Demonstrate an understanding of software testing terminology

4. Labs 4 – 6
   - Develop test cases based upon a given specification
   - Interpret actual results against predicted results
   - Prepare bug reports using an incident logging tool
   - Rewrite test cases to match changes in product specifications
   - Update the status of incident reports

5. Test management and tool support for testing (Chapters 5 – 6)
   - Explain the basic ideas of test organization
   - Describe the fundamentals of test planning and implementation
   - Explain the essentials of test progress monitoring and control
   - Identify the basics of configuration management that relate to testing
   - Explain how risk and testing relate
   - Describe incident logging
   - Classify different types of test tools according to the test process activity that they support
   - Recognize the tools that may help developers in their testing
   - Assess the potential benefits and potential risks of tool support for testing in general
   - State the main principles of introducing a tool into an organization
   - State the goal of a proof-of-concept or piloting phase for tool evaluation
   - Demonstrate an understanding of software testing terminology

6. Labs 7 – 9
   - Construct detailed test schedules using Microsoft Project
   - Create test cases and scripts using industry standard tools
   - Create test scenarios that incorporate the test cases and scripts previously created

Capstone Lab 10 and Research Paper
- Evaluate and arrange data collected from testing history
- Prepare and justify a ship recommendation based on your analysis
- Select a topic of interest in software testing
- Prepare a research paper on this topic
- Summarize the key elements as they relate to Software Testing