Welcome to CS 3250 Software Testing
Learning Objectives

• Become better testers
  • Understand and be able to create high-quality tests at all testing levels
  • Understand practical ways to design and automated high-quality tests
  • Understand how to apply theory (test criteria) in practical ways

• Become better programmers
  • Be aware of potential problems in software and able to create high-quality developer tests

• Become better engineers
  • Understand and be able to build programs and test them in a unified manner

• Become better thinkers
  • Understand and be able to approach software problem solving in logical, analytical ways
How Do We Get There?

- What is software testing?
- Why do we test software?
- When should we test software?
- Who should test software?
- How should we test software? Why should we do it that way?
- When should we stop testing? Good enough?
- How many tests do we need to write?
- How do we choose test inputs effectively?
- How can we measure the quality of a test suite?
- How can we improve the quality of a test suite?
- How can we reduce the testing cost?
Course Topics

• Importance of Software Testing

• Testing in Practice
  • Testing activities: test design, test automation, test execution, and test evaluation

• Test Automation

• Test-Driven Development
  • Test harness
  • Testing in Agile process

• Test Coverage Criteria
  • Input space partitioning
  • Graph coverage
  • Logic coverage
  • Syntax coverage

Instead of how testing is done, we focus on how it should be done and how it will be done

“The true subject matter of the tester is not testing, but the design of test cases” — Jeff Offutt
Prerequisites

- Discrete math, programming, data representation, and general knowledge of software engineering
- Java, syntax and semantics of multiple programming languages
- Software installation skills

**Intent:** Prerequisites define what you need to know before taking a class to succeed in the class

- Not knowing that material means you are taking the class “at risk” – that is your responsibility

Please do not ask if you “can take the class without the prerequisites”
You **can**, but I have to advise **against** it
Logistics

- **Class URL:** http://www.cs.virginia.edu/~up3f/cs3250/
- **Objective:** Designing effective tests; testing in practice
- **Readings:** Posted in schedule, please read before class
- **Textbook:**
  - URL https://cs.gmu.edu/~offutt/softwaretest/
- **Video:** Recording lectures / class meetings ... depends on attendance
- **Guest speaker sessions:** Required attendance
Learning Activities

- **Quizzes:** Five quizzes, biweekly, first 10-15 minutes of class
  - No makeups, no late quizzes, no dropped quizzes
  - One reflection and correction each

- **In-class exercises:** Weekly, require submission
  - No makeups, 2 lowest grades dropped for unavoidable absences

- **In-class activities:** Almost every meeting, no submission

- **Homework:** (Almost) weekly, due at the beginning of class
  - 25% deduction for late submissions per day
  - Not accepted after 2 days past the due date

- **Showcase:** Choose one
  - Option 1: Test generation
  - Option 2: Position paper

- **Final exam:** Comprehensive closed-book/note, in class
Discussion Board Use

• This course uses Piazza
  • URL: https://piazza.com/virginia/fall2019/cs3250/home
  • You should have gotten an invitation today
  • If not, check your UVA email or check with me

• Questions should be posted to an appropriate thread
  • Answered by instructor, course staff, and your peers
  • General questions and answers available for all to see (public)
  • Grade-specific or homework-specific questions should be made private and tagged instructor and course staff
Grading Policy

By default, grades will not be rounded in this course.
Computing Your Grade

1. **In-class exercise scores**
   - If in-class score >= 20, convert to 20.
   - In-class = actual score.

2. **Homework scores**
   - Convert into 20.
   - If HW score >= 20, HW = actual score.
   - HW = 20.

3. **Quiz scores**
   - Convert into 30.
   - If Quiz score >= 30, Quiz = actual score.
   - Quiz = 30.

4. **Final exam scores**
   - Convert into 20.
   - If Final exam score >= 20, Final exam = actual score.
   - Final exam = 20.

**Total score** = in-class + homework + showcase + quiz + final exam

**Letter grade**