HOOD COLLEGE
Department of Computer Science

Syllabus
CS 525 Software Testing and Quality Assurance
Spring 2007

Lectures: T 06:20PM-08:50PM, at HT 316
Instructor: Dr. G. Dimitoglou (dimitoglou[at]hood.edu)
Office Hours: Mon, Tue 5:00-6:00pm, Thu 4:00-5:00pm; other times by appointment. Office: HT 261

Course Description
This course examines the theory and practice behind software testing and quality assurance. Emphasis is placed on understanding the software testing process, planning, strategy, criteria, and testing methods, as well as software quality assurance concepts & control process. Topics will include test models, test design techniques (black box and white-box testing), integration, regression, measurement, unit testing, slicing and debugging, inspection, and software metrics. Emerging concepts and their impact on testing will also be examined. This is both a theoretical and hands-on course. Multiple software testing suites will be used during the semester to enforce student mastery of the material. Prerequisite: CS 524 or permission of the instructor.

Course Objectives
By the end of the course students will:
(a) Be able to testing software programs to software requirements using a test plan.
(b) Understand and perform software cost estimation.
(c) Understand software metrics and how they relate to testing
(d) Understand and be able to apply various software testing
(e) Know how to write and understand test plans and test procedures.
(f) Be able to write a test plan based on the requirements document.
(g) Explain problems and benefits in structured programming and machine language.
(h) Understand the concepts of correctness and completeness as they relate to software quality

Main Text
Software Testing, by Paul C. Jorgensen, CRC, 2nd edition (required)

Grading
Homework 30%, Mid-Term Exam 35%, Final Exam 35%

Policies-Guidelines
1. Adhering to the Academic Honesty Policy/Honor Code is student responsibility. Deviation from the policy will not be tolerated. Discussions with classmates are permitted but deliverables must be your own, individual work.
2. Assignments are due in the beginning of class. Late deliverables receive zero points. No exceptions.
3. You are responsible for the content of reading assignments, lectures, handouts, announcements and schedule changes made in class whether or not you are present. If you must miss a class, be sure to check Blackboard.
4. Attendance is expected at each class meeting. While there is no attendance grade, it is in your own best interest to attend class, as your grade will almost certainly suffer indirectly if you choose not to attend.
5. The material in the course is, inherently, cumulative. Be aware, if you fall behind, it may be difficult to catch up.
Topics
1. Introduction to software testing and analysis
2. Specification-based testing techniques
3. Code-based testing techniques
4. Unit testing
5. Integration testing
6. Model-based testing
7. Static analysis
8. Dynamic analysis
9. Regression testing
10. Methods of test data generation and validation
11. Program slicing and its application
12. Reliability analysis
13. Formal methods; verification methods; oracles
14. System and acceptance testing

Class Schedule
1. January 23, 2007 Overview of Testing/ Mathematical Background
3. February 6, 2007 Structural analysis and Clear-box techniques
4. February 13, 2007 Functional analysis and Opaque-box techniques
5. February 20, 2007 Test Case Evaluation techniques (mutation); Comparing Techniques; D.F.T. (PIE)
6. February 27, 2007 TBA
7. March 6, 2007 TBA
8. March 13, 2007 NO CLASS – Midterm Recess
9. March 20, 2007 Midterm Examination
10. March 27, 2007 Test Case reduction techniques & Latin squares; Misc. techniques (Logical space, Fault-Based
11. April 3, 2007 The Testing Process, unit, integration and system testing
14. April 24, 2007 TBA
15. May 1, 2007 TBA
16. May 8, 2007 Final Examination

Exams
The exams consist of expository and problem-solving questions similar to the homework assignments. The exams are closed book. The exams do not require memorization, only mastery of the material. Their content is cumulative, i.e. they address the material covered up to the day of the exam.

If a student misses the midterm exam due to an emergency (as agreed in advance by the instructor and/or by providing definite proof of medical or legal reason), there will be no makeup exam: the final will become proportionally more important.

If a student misses the midterm exam without prior agreement by the instructor and/or definite proof as to the medical or legal reasons, the student receives a zero grade for the exam.

The final exam is mandatory.
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