CISC 327  Software Quality Assurance
Course Information - Fall 2015 (REVISED)

Professor Dr. James R. Cordy, Rm. 625 Goodwin Hall, 533-6054, cordy@cs.queensu.ca
Office hours: Wed 2:00-3:00 pm, other times by email appointment

Lectures Slot 4  Tue 08:30, Wed 10:30, Fri 09:30  Rm. B201 Mackintosh-Corry Hall

TA Eric Rapos, Rm. 624 Goodwin Hall, eric@cs.queensu.ca
Leah Robert, 1ler1@queensu.ca

Advising Tuesday & Thursday, 5:30-6:30 pm, place TBA
In this course the primary role of the TA will be to advise you on coordination and evaluation of your course project. The TA will provide you with advice and assistance in working on the project.

Website http://www.cs.queensu.ca/home/cordy/cisc327

Textbook The primary source for course material will be lectures, augmented by additional secondary sources in the course notes available at the bookstore ...

Cordy, CISC 327 Course Reader 2015 (or 2014 version, which is the same).

Lectures and additional web materials will be provided online on the course website http://www.cs.queensu.ca/home/cordy/cisc327 as the course progresses.

Course Project
Since this is a course on the practical aspects of software quality, the course project will provide you with an opportunity to put what you learn into practice.

The project will be carried out using the principles and philosophy of the Extreme Programming methodology. You will form small (three person) software companies who will contract to provide a software system roughly specified by a set of user desires, which you will hone into requirements, specifications, design quality plans, tests, and test plans as you develop solutions. Details of the project will be handed out in the second week of the course.

Aims of the Course
The primary purpose of this course is to introduce you to the concepts, theory and practice of software quality assurance through process, testing, inspection and measurement. It is not a course in the broader aspects of software engineering, except insofar as they relate to quality control.

Material Covered
Introduction (1 week)
  • Quality - what is it, how is it measured, how is it achieved

Software Process (2 weeks)
  • Software Process Models - plans for achieving and improving software quality
  • eXtreme Programming - a controversial modern software process

Software Testing (3 weeks)
  • Systematic Testing - what is it, levels of testing, designing for test
  • Black Box Testing - functional, input, output, partitioning and gray box testing
  • White Box Testing - coverage, path, decision and mutation testing
  • Continuous Testing - regression, defect testing
  • Test Automation - test maintenance and analysis, harnesses, tracking, tools

Software Inspection (2 weeks)
  • Systematic Inspection - what is it, levels of inspection, inspection process, formal reviews
  • Inspection in the Software Process - requirements, design, process and code inspections
  • Code Inspection - techniques, practices, continuous inspection, refactoring
  • Automated Inspection - design recovery, clone detection

Software Measurement (2 weeks)
  • Software Metrics - measurement basics, assessment and prediction
  • Product Quality Metrics - external, internal, faults, failures and defects
  • Code and Structure Metrics - size, complexity and functionality metrics
  • Process Metrics - predicting cost and effort, regression analysis, function points

Software Safety and Security (1 week)
  • Software Safety - issues and methods
  • Software Security - issues and methods

Overflow & Review (1 week)
Marking

6 Course Project Assignments 40%
3 In-class Tests 20%
Final Exam 40%

There is no “exam only” option in this course, but you must pass the final examination to pass the course.

Preliminary Schedule (Subject to change - see the course website for the current schedule)

Quizzes
Q1: Introduction and Process Tue Oct 6
Q2: Testing Tue Nov 3
Q3: Inspection and Metrics Tue Dec 1

Project Assignments
A0: Choose Teams Tue Sep 29
A1: Front End Requirements Tests Thu Oct 8
A2: Front End Rapid Prototype Thu Oct 22
A3: Front End Requirements Testing Thu Nov 5
A4: Back End Rapid Prototype Tue Nov 17
A5: Back End Unit Testing Tue Nov 24
A6: Integration and Delivery Fri Dec 4