

Module Title/Name: Testing and Reliable Software Engineering	Module Code: CS3270
School: Engineering and Applied Science	Module Type: Standard Module
New Module? No	Module Credits: 10

Module Management Information

Module Leader Name	<i>Errol Thompson</i>
Email Address	<i>thompel1@aston.ac.uk</i>
Telephone Number	<i>3294</i>
Office	<i>MB205</i>

Level Description: <i>Level 6 (Bachelors)</i>	Programmes in which available: <i>BSc Computing Science. BSc Computing for Business. BSc Multimedia Computing. BSc Mathematics with Computing. BEng Electronic Engineering and Computer Science.</i>
	Available to Exchange Students? <i>Yes</i>

Module Learning Information

<p>Module Aims: <i>Students will develop the skills to become professional software testing analysts and an understanding of the importance of testing practices in creating reliable software. This knowledge will be applied in the context of agile and traditional approaches to developing software. The students will be expected not only to be able to apply the test strategies and design techniques covered but to reason about the importance of testing and its place in the software development lifecycle.</i></p>
<p>Module Learning Outcomes: <i>By the end of this module, you should be able to:</i></p> <ol style="list-style-type: none"> <i>1) Discuss the role of a tester in both agile and traditional software development processes</i> <i>2) Build an argument for the effectiveness of a testing strategy</i> <i>3) Develop user requirements that are testable and verifiable</i> <i>4) Build software using both test-driven development (TDD) and behaviour-driven development (BDD)</i> <i>5) Discuss the difference between TDD and BDD</i> <i>6) Discuss the difference between programmer written tests and tester written tests</i> <i>7) Develop and implement software test plans for medium scale software projects (e.g. final year projects (CS3010))</i> <i>8) Critically assess software design and implementation for reliability and testability</i> <i>9) Describe software testing tools and design techniques</i> <i>10) Write and implement software tests</i>
<p>Indicative Module Content: <i>The Agile software development methodology; the agile manifesto; software reliability engineering; developing user stories for requirements capture and test driven software development; software testing methods: white/black/grey box testing; software testing levels: unit integration, system regression, acceptance; software testing processes history, test plan, scope, functional and</i></p>

non-functional testing, waterfall vs agile; agile testing quadrants.

Thinking like a tester; testing as applied epistemology; the testing role in software development team.

Software quality assurance.

International Dimensions:

The material is being aligned with the international software quality board assessment standards

Corporate Connections:

At different points during the presentation of the material reference will be made to the applicability of industry practice.

Ethical Approval:

The use of live data in testing will be discussed in terms of the ethical implications and access to personal information.

Links to Research:

The primary reference text goes beyond current industry practice. New testing strategies will be introduced as time and space allow. Students are also expected to do some of their own reading to expand their understanding of the field.

Corporate Social Responsibility:

The importance of testing especially for systems that involve possible threat to life or the environment is stressed in the materials.

Module Delivery

Methods of Delivery & Learning Hours (by each method):

Method of Delivery	Learning Hours
Lecture:	22 hours
Lab Session:	11 hours
Independent Study:	56 hours
Pre-Reading:	11 hours
Total Learning Hours:	100 hours

Learning & Teaching Rationale:

The objective is to make the lectures as interactive as possible with students completing exercises on the topics being covered during the lectures. Ideally, we would like to see some debate between the students so that they are doing the thinking and reasoning around the topic.

Module Assessment

Methods of Assessment & associated weighting (including approaches to formative assessment as well as summative):

Assessment Type	Category	Duration/ Submission Date	Common Modules/ Exempt from Anonymous Marking Details	Assessment Weight
Coursework	Individual Assignment	09/Feb/2015	Yes	4%
Details	Mini-assignment: The role of a tester (1 page maximum)			

Coursework	Individual Assignment	23 February 201	Yes	4%
<i>Details</i>	Mini-assignment: Preparing tests using BDD and TDD			
Coursework	Individual Assignment	9 March 2015	Yes	4%
<i>Details</i>	Mini-assignment: Designing tests using black and white box strategies			
Coursework	Individual Assignment	23 March 2014	Yes	4%
<i>Details</i>	Mini-assignment: Scenario and exploratory testing			
Coursework	Individual Assignment	27 April 2015	Yes	4%
<i>Details</i>	Mini-assignment: Performance and security testing			
Project	Individual Assignment	4 May 2015	Yes	40%
<i>Details</i>	Mini-project: Preparing a testing plan and test cases for a project			
February to June Exam	Closed Book	2:00hrs	-	40%
<i>Details</i>	4 questions			
Total:				100%

Method of Submission:

Electronic Copy Only

Assessment Rationale:

The mini-assignments are designed to provide a way of verifying that the student understands how to write tests prior to completing the min-project where they will have to develop a complete test plan and implement the test cases. The exam explores their theoretical understanding of the testing concepts covered.

Feedback Rationale:

Students will be provided with sample solutions for lab worksheets and the mini-assignments. They will also receive individual feedback on submitted mini-assignments. There will also be times during lecture/tutorial and lab sessions when the students will be able to ask questions and gain additional feedback.

It is intended that the feedback from the mini-assignments should help ensure that the students understand what is required to complete the mini-project.