

Subject Description Form

Subject Code	COMP5222																																					
Subject Title	Software Testing and Quality Assurance																																					
Credit Value	3																																					
Level	5																																					
Pre-requisite/ Exclusion	Nil																																					
Objectives	<p>The objectives of this subject are to:</p> <ol style="list-style-type: none"> 1. present effective testing techniques (both black-box and white-box) for ensuring high quality software; 2. learn metrics for managing quality assurance and understand capabilities of test tools. 																																					
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a) know the definition of quality, cost of quality, quality model; b) apply white-box testing, black-box testing, and inspection techniques; c) know how test tools can be used in the testing life cycle; d) use testing metrics for product and process; e) understand how to do performance testing and usability testing. 																																					
Subject Synopsis/ Indicative Syllabus	<ul style="list-style-type: none"> • Software Quality Concepts: Software quality problems. Quality definition. Cost of quality, Quality model. • Code-based Testing Techniques: Control flow and data flow testing. Mutation testing. Symbolic evaluation. Domain testing. • Specification-based Testing Techniques: Equivalence partitioning. Boundary value analysis. Cause-effect graphing. Random testing. State machine testing. Formal program verification. • Inspection Technique: Process, Role, Templates. • Management of Software Quality: Responsibility. Test cycle (unit, integration, system, alpha and beta testing phases). Design and code reviews. Test plans. Test tools. Quality metrics. Quality prediction. In-process quality tracking. 																																					
Teaching/Learning Methodology	Class activities including - lecture, tutorial, lab, workshop seminar where applicable																																					
Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Specific Assessment Methods/Tasks</th> <th rowspan="2">% weighting</th> <th colspan="5">Intended subject learning outcomes to be assessed</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> </tr> </thead> <tbody> <tr> <td>Assignments, Tests & Projects</td> <td style="text-align: center;">55</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> <tr> <td>Final Examination</td> <td style="text-align: center;">45</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> <tr> <td>Total</td> <td style="text-align: center;">100</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					Specific Assessment Methods/Tasks	% weighting	Intended subject learning outcomes to be assessed					a	b	c	d	e	Assignments, Tests & Projects	55	✓	✓	✓	✓	✓	Final Examination	45	✓	✓	✓	✓	✓	Total	100					
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Final Examination	45	✓	✓	✓	✓	✓																																
Total	100																																					
Student study effort expected	Class Contact:																																					
	Class activities (lecture, tutorial, lab)				39 hours																																	
	Other student study effort:																																					
Assignments, Quizzes, Projects, Exams				65 hours																																		

	Total student study effort	104 hours
Reading list and references	<ul style="list-style-type: none"> (1) Jorgensen, P.C., 2013, Software Testing: A Craftsman's Approach, 4th Ed, Auerbach Publications. (2) Myers, G.J., Sandler, C., Badgett, T., 2011, The Art of Software Testing, 3rd Ed, Wiley. (3) McCaffrey, J.D., 2009, Software Testing: Fundamental Principles and Essential Knowledge, BookSurge Publishing. 	