Subject Description Form

Subject Code	COMP3233
Subject Title	Software Testing and Quality Assurance
Credit Value	3
Level	3
Pre-requisite / Co-requisite / Exclusion	**Pre-requisite**: COMP3211
Objectives	The objectives of this subject are to: 1. present the concepts, techniques and metrics for quality assurance in software development; 2. develop a good understanding of issues, techniques and tools for software testing; and 3. enable students to gain a working knowledge of techniques for management of testing projects.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: *Professional/academic knowledge and skills* (a) appreciate the importance of software quality assurance; (b) integrate practical testing techniques into the software development lifecycle; (c) know the inputs and deliverables of the testing process; *Attributes for all-roundedness* (d) work together as a team; (e) communicate in writing a technical document; and (f) communicate effectively in English for general project presentation.

Subject Synopsis/ Indicative Syllabus	**Topic** **1. Software Quality Assurance** Quality factors; cost of quality. **2. Testing Fundamentals** Understanding defects; testing concepts; levels of testing; test process **3. Code-based Techniques** Control flow and data flow testing; mutation testing; domain testing; error-oriented testing. **4. Specification-based Techniques** Equivalence partitioning; boundary value testing; state machine testing; program verification. **5. System Testing Techniques** Configuration testing; Compatibility testing; Usability testing; Web Testing; Security testing. **6. Inspection Technique** Team and roles; process. **7. Test Tools** Test generation tools; Test automation tools; code coverage tool; defect tracking tools. **8. Measuring Software Quality** Product metrics; process metrics; GQM; testing maturity model.
Teaching/ Learning Methodology	The software testing techniques and quality assurance concepts will be covered in the lectures. In the tutorials, students will work on exercises and case studies on software testing techniques. The tutorial will also cover common software testing tools (e.g. unit testing, coverage measurement, GUI testing, performance testing, security testing).

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/ tasks	% weighting	Intended subject learning outcomes to be assessed					
		a	b	c	d	e	f
Continuous Assessment	**55%**						
1. Assignments		✓	✓	✓			
2. Project			✓		✓	✓	✓
3. Mid-Term		✓	✓	✓			
Examination	**45%**	✓	✓	✓			
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Students are required to work as a team on a project related to software testing and software quality assurance. This can be used to assess the students on their (b) understanding in software testing techniques for information systems development. Also, the students will be assessed on their ability to (d) work together as a team in preparing a report, (e) writing technical documents, and (f) communicateeffectively in English for general project presentation.

Assignment(s), mid-term(s) and the final examination will be used to assess the students on their academic knowledge and skills in software testing, which include the ability to (a) appreciate the importance of software quality assurance, (b) apply software testing techniques for information systems development and (c) knowledge in the inputs and deliverables of the testing process.

Student Study Effort Expected

Class contact:	
▪ Lecture/Tutorial/Lab	39 Hrs.
Other student study effort:	
▪ Assignments, Project, and Self-study	70 Hrs.
Total student study effort	109 Hrs.

Reading List and References

Reference Books:

1. Patton, Ron, *Software Testing,* 2nd Edition, Sams Publishing,2005.
2. Nguyen, Hung Q., Johnson, Bob, Hackett, Michael and Johnson, Robert, *Testing Applications on the Web: Test Planning for Mobile andInternet-Based Systems*, 2nd Edition, John Wiley, 2003.
3. Craig, Rick D. and Jaskiel, Stefan P., *Systematic Software Testing*, Artech House Publishers, 2002.
4. Godbole, Nina S., *Software Quality Assurance: Principles And Practice*, Alpha Science International Ltd., 2004.