

SUBJECT DESCRIPTION FORM

Subject Title: Software Testing and Quality Assurance

Subject Code: COMP5222

Credit Value: 3

Pre-requisite: (subject title and code no. if any)

Software Engineering Concepts (COMP509/COMP5211) or equivalent
[waived for students of MSc in Information Systems (Outpost) , MSc in Software
Technology and MSc in E-Commerce]

Recommended Background Knowledge:

Some working experience in software development

Mutual Exclusions:

Software Quality Assurance (COMP546)

Learning Approach:

42 hours of Class activities including - lecture, tutorial, lab, workshop seminar where
applicable

Assessment:

Continuous Assessment	45%
Test, and Examination	55%

Objectives:

This subject aims to present effective testing techniques (both black-box and white-box) for ensuring high quality software. The students will learn metrics for managing quality assurance and understand capabilities of test tools.

The Department reserves the right to update the syllabus contents. Please note that the learning approach for the same subject could vary slightly due to different delivery modes.

Learning Outcomes:

After completing this subject, students should be able to:

1. know the definition of quality, cost of quality, quality model;
 2. apply basic white-box testing techniques;
 3. apply basic black-box testing techniques;
 4. apply inspection techniques;
 5. know how test tools can be used in the testing life cycle;
 6. use testing metrics for product and process;
 7. understand how to do performance testing; and
 8. understand how to do usability testing.
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Keyword Syllabus:

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.

Reading List & References:

Culbertson, R., Brown, C., Cobb, G., *Rapid Testing*, Prentice Hall, 2002.
Kaner, C., Falk, J., Nguyen, H.Q., 1999, *Testing Computer Software*, John Wiley.
Nguyen, H.Q., 2001, *Testing Applications on the Web*, John Wiley.
Kaner, C, Bach, J., Pettichord, B., *Lessons Learned in Software Testing*, John Wiley, 2002.
IEEE Std. 829, 1008, 1012, 1059, 1028, 1044