City University of Hong Kong
Course Syllabus

offered by Department of Computer Science
with effect from Semester A 2022/23

Part I   Course Overview

Course Title: Software Quality Engineering

Course Code: CS5348

Course Duration: One semester

Credit Units: 3 credits

Level: P5

**Medium of
Instruction:** English

**Medium of
Assessment:** English

Prerequisites:
(Course Code and Title) CS5351 Software Engineering

Precursors:
(Course Code and Title) Nil

Equivalent Courses:
(Course Code and Title) Nil

Exclusive Courses:
(Course Code and Title) Nil

Part II   Course Details

1.   Abstract

This course aims to equip students with the engineering principles and professional practices in software testing and quality management activities. It prepares students to assess the quality of software products and processes using systematic and methodical techniques in software testing and established standards in software quality assurance, management and engineering.

2.   Course Intended Learning Outcomes (CILOs)
(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Critically analyze software process and quality models for assessing software products and processes.		✓		
2.	Describe and apply engineering principles and professional practices and techniques in software testing, quality assurance and management.			✓	
3.	Describe, evaluate and critique quality management principles, systems and established standards for software products and processes.		✓		
		100%			

A1:   *Attitude*
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.
A2:   *Ability*
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.
A3:   *Accomplishments*
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No. 1	2	3	Hours/week (if applicable)
Lecture and class discussion	Explain key subject knowledge and background. Require students to participate actively in class to discuss and critically reflect on their software development practices and experiences in light of the subject materials presented in class.	✓	✓	✓	2 hours/ week
Tutorial	Provide short exercises for students to work on different techniques and consolidate key concepts, models, principles and issues in software testing, processes and quality management.	✓	✓	✓	1 hour/ week
Assignment or project	Require students to practise software testing and quality assurance and management activities, such as design of testing strategies, test case generation, development of quality plans or review/inspection.		✓		

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No. 1	2	3	Weighting	Remarks
Continuous Assessment: 40%					
Assignment or project		✓		20%	
Assignment or quiz		✓		20%	
Examination^: 60% (duration: 2 hours)	✓	✓	✓	60%	
				100%	

^ For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Applicable to students admitted in Semester A 2022/23 and thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Assignment or project	1.1 ABILITY to DESCRIBE and APPLY professional and engineering practices and techniques in software quality assurance and management	High	Significant	Moderate to Basic	Not even reaching marginal levels
2. Assignment or quiz	2.1 ABILITY to DESCRIBE and APPLY professional and engineering practices and techniques in software quality assurance and management	High	Significant	Moderate to Basic	Not even reaching marginal levels
3. Examination	3.1 ABILITY to ACHIEVE the respective CILOs	High	Significant	Moderate to Basic	Not even reaching marginal levels

Applicable to students admitted before Semester A 2022/23

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Assignment or project	1.1 ABILITY to DESCRIBE and APPLY professional and engineering practices and techniques in software quality assurance and management	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Assignment or quiz	2.1 ABILITY to DESCRIBE and APPLY professional and engineering practices and techniques in software quality assurance and management	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Examination	3.1 ABILITY to ACHIEVE the respective CILOs	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
    (An indication of the key topics of the course.)

    Software testing principles and approaches. Specification-based testing. Category-partition testing. Combinatorial testing. Random testing. Code-based analysis. Control flow and predicate testing. Software quality concepts, models, principles and standards. Software quality assurance and management. Software product, process and project. Quality and risk management. Software reviews and inspection.

2. **Reading List**
2.1 **Compulsory Readings**
    (Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Myers, G.J., Badgett, T. & Sandler, C. (2012). *The Art of Software Testing*. 3rd Ed. Wiley.
2.	Galin, D. (2018). *Software Quality: Concepts and Practice*. 1st Ed. IEEE Computer Society Press.
3.	Selected documents from international standards: accessible online via CityU library.
4.	Selected professional/research articles from *IEEE* and *ACM*: accessible online via CityU library.

2.2 **Additional Readings**
    (Additional references for students to learn to expand their knowledge about the subject.)

1.	Pressman R.S. and Maxim B.R. (2015). *Software Engineering: A Practitioner's Approach*. 8th Ed. McGraw-Hill.
2.	Sommerville, I. (2016). *Software Engineering*. 10th Ed. Addison Wesley.