CS5348: SOFTWARE QUALITY ENGINEERING

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Software Quality Engineering

Subject Code
CS - Computer Science
Course Number
5348

Academic Unit
Computer Science (CS)

College/School
College of Computing (CC)

Course Duration
One Semester

Credit Units
3

Level
P5, P6 - Postgraduate Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
CS5351 Software Engineering

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

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.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Critically analyze software process and quality models for assessing software products and processes.		x		
2	Describe and apply engineering principles and professional practices and techniques in software testing, quality assurance and management.			x	
3	Describe, evaluate and critique quality management principles, systems and established standards for software products and processes.		x		

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 real-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.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture and class discussion	Students will engage in lectures explaining key subject knowledge and background. Students are required 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.	1, 2, 3	2 hours/ week
2	Tutorial	Students will engage in short exercises on different techniques and consolidate key concepts, models, principles and issues in software testing, processes and quality management.	1, 2, 3	1 hour/ week

3	Assignment or project	Students will 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.	2	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Assignment or project	2	20	-	Yes
2	Assignment or quiz	2	20	-	No

Continuous Assessment (%)

40

Examination (%)

60

Examination Duration (Hours)

2

Minimum Examination Passing Requirement (%)

30

Additional Information for ATs

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

Assessment Rubrics (AR)

Assessment Task

Assignment or project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

1.1 ABILITY to DESCRIBE and APPLY professional and engineering practices and techniques in software quality assurance and management

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Assignment or quiz (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

2.1 ABILITY to DESCRIBE and APPLY professional and engineering practices and techniques in software quality assurance and management

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

3.1 ABILITY to ACHIEVE the respective CILOs

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

Assignment or project (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

1.1 ABILITY to DESCRIBE and APPLY professional and engineering practices and techniques in software quality assurance and management

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate to Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Assignment or quiz (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
2.1 ABILITY to DESCRIBE and APPLY professional and engineering practices and techniques in software quality assurance and management

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate to Basic

Failure
(F) Not even reaching marginal levels

Assessment Task
Examination (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion
3.1 ABILITY to ACHIEVE the respective CILOs

Excellent
(A+, A, A-) High

Good
(B+, B) Significant

Marginal
(B-, C+, C) Moderate to Basic

Failure
(F) Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

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.

Reading List

Compulsory Readings

	Title
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.

Additional Readings

	Title
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.