COMSATS INSTITUTE OF INFORMATION TECHNOLOGY (ISLAMABAD)
BS-SOFTWARE ENGINEERING (COURSE DESCRIPTION FORM)

CSE455 - SOFTWARE TESTING

Number of Credit Hours:	☑ 3 credits	❑ 4 credits	
Number of Lecture Hours per Week:	❑ 1 hour	☑ 2 hours	❑ 3 hours
Number of Lab Hours per Week:	❑ none	❑ 2 hours	☑ 3 hours
Number of Tutorial Hours per Week:	☑ none	❑ 1 hour	❑ 2 hours

Catalog Description:
Software Testing Foundation: Why Software Testing? Fundamental Test Process, Levels of Software Testing, Software Testing Life Cycle, Model Driven Test Design: Test Design, Test Automation, Test Execution, Test evaluation, Test personnel and Abstraction, Test Automation, Components of Test case, Test Automation Framework, Data Driven Tests, Graph Coverage Criteria, ; Control Flow; Data Dependency and Interaction Testing; Static and Dynamic Testing, Good and Bad Test Cases; Alpha, Beta and Acceptance Testing; Test Instrumentation and Tools; Test case design techniques, Black Box and White Box testing techniques, Black-Box Vs. Structural Testing Developing Test Plans; Managing the Testing Process; Test Case Results Analysis, Reporting Software Testing Process, Role of Software Metrics inTesting.

Prerequisites:
CSE 302-Software Quality Engineering

Text Book(s):

1. Software Testing Foundations, Spillner A., Linz, T., Schaefer H., 4th Edition, Rocky Nook.
2. Introduction to Software Testing, Paul Ammann and Jeff Offutt, Second Edition (2017).

Reference Book(s)
3. Fundamentals of Software Testing, Bernard Hom, 1st Edition (2012), Wiley.
4. Advanced Software Testing, Black, R., Rocky Nook, 2014.
5. Foundations of Software Testing, Mathur, A., Addison-Wesley Professional, 2014.

Assessment Plan for the Course:

Evaluation methods	**Theory Weight (%)[T]**	**Lab Weight(%)[L]**
Quizzes (4)	15	-
Assignments (4)	10	25
Sessional exam (I and II)	10 and 15	10 and 15
Terminal Exam	50	50
Total	100	100
Total =T+L	**T=(T/100)*67**	**L=(L/100)*33**

Major Topics Covered in the Course:

Unit	Topic	No of teaching hours
1.	Fundamentals of Testing: Terms and Motivation, Testing Goals, The Fundamental test process, The psychology of Testing, General principle of testing	3
2.	Software Testing Life Cycle: The General V-Model, Levels of Testing, Component Testing, Integration Test, System test, Acceptance Test.	3
3.	Static Test and Dynamic Tests: Structured Group Evaluations, Foundations, Reviews, The General Process, Roles and Responsibilities, Types of Reviews	1
4.	Model Driven Test Design (MDTD); Test Design, Test Automation, Test Execution, Test Evaluation, Test Personnel and Abstraction Test Automation; Software Testability, Components of Test Case, Test Automation Framework, Data Driven Tests	4
5.	Static Analysis, The Compiler as a Static Analysis Tool, Examination of Compliance to Conventions and Standards, Execution of Data Flow Analysis, Execution of Control Flow Analysis , Determining Metrics.	3
6.	Coverage Criteria; Black Box Testing Techniques: Equivalence Class Partitioning, Boundary Value Analysis, Transition Testing, Based Techniques (Cause-Effect Graphing and Decision Table Technique, Pairwise Testing), Use-Case-Based Testing, General Discussion of the Black Box Technique	7
7.	White Box Testing Techniques: Statement Testing and Coverage, Decision/Branch Testing and Coverage, Test of Conditions, Instrumentation and Tool Support, Intuitive and Experience-Based Test Case Determination	4
8.	Test Plan Document with IEEE Standard 829-1998 Guidelines	2
9.	Test Management: Test Organization, Planning, Cost and Economy Aspects, Choosing the Test Strategy and Test Approach, managing the test Work, Incident Management, Requirements to Configuration Management, Testing tools	3
Total Contact Hours		**30**

Course Learning Outcomes:

Upon completion of the course, students will be able to:

C1	Explain software testing processes and its levels
C2	Apply tests cases on medium size system
C3	Develop a software test plan for a medium size software system using standard method
C4	Demonstrate the use of modern software testing tools

Relationship between Course Learning Outcomes and Program Learning Outcomes:

Course Learning Outcomes	**Unit of the syllabus**	**Possible artifacts**	**Level**	**Program Learning Outcomes**
C1	1 – 2	Quizzes, Sessional Terminal	L	
C2	3 – 6	Quiz, Assignments Sessional, Terminal	M	
C3	7 – 8	Quiz, Assignments Sessional, Terminal	M	
C4	9	Quiz, Assignments Sessional, Terminal	L	