Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous Institute Affiliated to University of Mumbai)

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		L	T	P	L	T	P	Total
ITC8046	Software Testing & Quality Assurance	4	-	-	4	-	-	4
		Examination Scheme						
		ISE		MSE		ESE		
		10		30		100 (60%Weightage)		

Pre-requisite Course Codes	
After successful completion of the course, student will be able to:	

Course Outcomes	CO1	Identify the reasons for bugs & analyze the principles in software testing to prevent & remove bugs.	
	CO2	Implement various test processes for quality improvement.	
	CO3	Apply the software testing techniques in commercial environments.	
	CO4	Describing the variety of ways to test software and indicate the trade-offs between various testing techniques.	
	CO5	Identify the open source testing tools.	

Module No.	Topics	Ref.	Hrs.
1	**Testing Methodology** Introduction, Goals of Software Testing, Software Testing Definitions, Model for Software Testing, Effective Software Testing vs Exhaustive Software Testing, Software Failure Case Studies, Software Testing Terminology, Software Testing Life Cycle (STLC), Software Testing methodology, Verification and Validation, Verification requirements, Verification of high level design, Verification of low level design, validation.	1,2	10
2	**Testing Techniques** Dynamic Testing: Black Box testing: boundary value analysis, equivalence class testing, state table based testing, cause-effect graphing based testing, error guessing. White box Testing Techniques: need, logic coverage criteria, basis path testing, graph matrices, loop testing, data flow testing, mutation testing. Static Testing. Validation Activities: Unit validation, Integration, Function, System, Acceptance Testing.	1,2	12

	Regression Testing: Progressive vs. Regressive, regression testing produces quality software, regression testability, objectives of regression testing, regression testing types, Define problem, regression testing techniques.		
3	**Managing the Test Process** Test Management: test organization structure and of testing group, test planning, detailed test design and test specification. Software Metrics: need, definition and classification of software matrices. Testing Metrics for Monitoring and Controlling the Testing Process: attributes and corresponding matrices, estimation model for testing effort, architectural design, information flow matrix used for testing, function point and test point analysis. Efficient Test Suite Management: minimizing the test suite and its benefits, test suite minimization problem, test suite prioritization its type, techniques and measuring effectiveness.	1,2	10
4	**Test Automation** Automation and Testing Tools: need, categorization, selection and cost in testing tool, guide lines for testing tools. Study of testing tools: Win Runner, QTP, Road Runner, Test Director and IBM Rational Functional Tester, Selenium etc.	3,5	08
5	**Testing for Specialized Environment** Testing Object Oriented Software: OOT basics, Object-oriented testing. Testing Web based Systems: Web based system, web technology evaluation, traditional software and web based software, challenges in testing for web based software, testing web based testing, Testing a data warehouse.	3,5	05
6	**Quality management** Software Quality Management, McCall's quality factors and Criteria, ISO 9126 quality characteristics,ISO9000:2000,software quality management	3	03
	Total hours of instructions		48

References:

1. Naresh Chauhan ,"*Software Testing Principles and Practices*", Oxford Higher Education
2. Willam E.Perry, "*Effective Methods for Software Testing* ", third edition, Wiley Publication
3. K shirasagar Naik, Priyadarshi Tripathy," *Software Testing and quality assurance theory and practice*", Wiley Publication
4. Aditya P. Mathur, "*Foundation of SoftwareTesting*", Pearson publication.
5. M.G.Limaye, "*Software Testing Principles, techniques and tools*", Mc Graw Hill publication.