

## SOFTWARE TESTING

Subject Code	: <b>06IS81</b>	IA Marks	: 25
No. of Lecture Hours/ Week	: 04	Exam Hours	: 03
Total No. of Lecture Hours	: 52	Exam Marks	: 100

### PART - A

#### UNIT - 1

**BASICS OF SOFTWARE TESTING – 1:** Human Errors and Testing; Software Quality; Requirements, Behavior and Correctness; Correctness versus Reliability; Testing and Debugging; Test Metrics.

**6 Hours**

#### UNIT - 2

**BASICS OF SOFTWARE TESTING – 2:** Software and Hardware Testing; Testing and Verification; Defect Management; Execution History; Test-generation Strategies, Static Testing. Model-Based Testing and Model Checking; Control-Flow Graph; Types of Testing; The Saturation Effect.

**6 Hours**

#### UNIT - 3

**TEST GENERATION FROM REQUIREMENTS – 1:** Introduction; The Test-Selection Problem; Equivalence Partitioning; Boundary Value Analysis; Category-Partition Method.

**7 Hours**

#### UNIT - 4

**TEST GENERATION FROM REQUIREMENTS – 2:** Cause-Effect Graphing, Test Generation from Predicates.

**7 Hours**

### PART - B

#### UNIT - 5

**STRUCTURAL TESTING:** Overview; Statement testing; Branch testing; Condition testing, Path testing; Procedure call testing; Comparing structural testing criteria; The infeasibility problem.

**6 Hours**

**UNIT - 6**

**DEPENDENCE, DATA FLOW MODELS, AND DATA FLOW TESTING:** Definition-Use pairs; Data flow analysis; Classic analyses; From execution to conservative flow analysis; Data flow analysis with arrays and pointers; Inter-procedural analysis; Overview of data flow testing; Definition-Use associations; Data flow testing criteria; Data flow coverage with complex structures; The infeasibility problem.

**6 Hours**

**UNIT - 7**

**TEST CASE SELECTION AND ADEQUACY, TEST EXECUTION:** Overview; Test specification and cases; Adequacy criteria; Comparing criteria; Overview of test execution; From test case specification to test cases; Scaffolding; Generic versus specific scaffolding; Test oracles; Self-checks as oracles; Capture and replay.

**6 Hours**

**UNIT - 8**

**PROCESS:** Test and analysis activities within a software process: The quality process; Planning and monitoring; Quality goals; Dependability properties; Analysis; Testing; Improving the process; Organizational factors.

Integration and component-based software testing: Overview; Integration testing strategies; Testing components and assemblies. System, Acceptance and Regression Testing: Overview; System testing; Acceptance testing; Usability; Regression testing; Regression test selection techniques; Test case prioritization and selective execution.

**8 Hours**

**TEXT BOOKS:**

1. **Foundations of Software Testing** - Aditya P Mathur, Pearson Education, 2008.
2. **Software Testing and Analysis Process Principles and Techniques** – Mauro Pezze, Michal Young, Wiley India, 2008.

**REFERENCE BOOKS:**

1. **Software Testing Principles and Practices** - Srinivasan Desikan, Gopaldaswamy Ramesh, 2<sup>nd</sup> Edition, Pearson, 2007.
2. **Software Testing** - Ron Patton, 2<sup>nd</sup> edition, Pearson, 2004.
3. **The Craft of Software Testing** - Brian Marrick, Pearson, 1995.