

**SOFTWARE TESTING**  
(Effective from the academic year 2018 -2019)  
**SEMESTER – VI**

<b>Course Code</b>	<b>18IS62</b>	<b>CIE Marks</b>	<b>40</b>
<b>Number of Contact Hours/Week</b>	<b>3:2:0</b>	<b>SEE Marks</b>	<b>60</b>
<b>Total Number of Contact Hours</b>	<b>50</b>	<b>Exam Hours</b>	<b>03</b>

**CREDITS –4**

**Course Learning Objectives:** This course (18IS62) will enable students to:

- Differentiate the various testing techniques
- Analyze the problem and derive suitable test cases.
- Apply suitable technique for designing of flow graph
- Explain the need for planning and monitoring a process

**Module 1**

**Contact  
Hours**

**Basics of Software Testing:** Basic definitions, Software Quality , Requirements, Behaviour and Correctness, Correctness versus Reliability, Testing and Debugging, Test cases, Insights from a Venn diagram, Identifying test cases, Test-generation Strategies, Test Metrics, Error and fault taxonomies , Levels of testing, Testing and Verification, Static Testing. **Problem Statements:** Generalized pseudocode, the triangle problem, the NextDate function, the commission problem, the SATM (Simple Automatic Teller Machine) problem, the currency converter, Saturn windshield wiper  
**T1:Chapter1, T3:Chapter1, T1:Chapter2.**  
**RBT: L1, L2, L3**

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**Module 2**

**Functional Testing:** Boundary value analysis, Robustness testing, Worst-case testing, Robust Worst testing for triangle problem, Nextdate problem and commission problem, Equivalence classes, Equivalence test cases for the triangle problem, NextDate function, and the commission problem, Guidelines and observations, Decision tables, Test cases for the triangle problem, NextDate function, and the commission problem, Guidelines and observations. **Fault Based Testing:** Overview, Assumptions in fault based testing, Mutation analysis, Fault-based adequacy criteria, Variations on mutation analysis.  
**T1: Chapter 5, 6 & 7, T2: Chapter 16**  
**RBT: L1, L2, L3**

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**Module 3**

**Structural Testing:** Overview, Statement testing, Programme testing, Condition testing , Path testing: DD paths, Test coverage metrics, Basis path testing, guidelines and observations, Data –Flow testing: Definition-Use testing, Slice-based testing, Guidelines and observations. **Test Execution:** 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  
**T3:Section 6.2.1, T3:Section 6.2.4, T1:Chapter 9 & 10, T2:Chapter 17**  
**RBT: L1, L2, L3**

**Module 4**

**Process Framework :**Basic principles: Sensitivity, redundancy, restriction, partition, visibility, Feedback, the quality process, Planning and monitoring, Quality goals, Dependability properties ,Analysis Testing, Improving the process, Organizational factors.  
**Planning and Monitoring the Process:** Quality and process, Test and analysis strategies and plans, Risk planning, monitoring the process, Improving the process, the quality team  
**Documenting Analysis and Test:** Organizing documents, Test strategy document, Analysis and test plan, Test design specifications documents, Test and analysis reports.

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<b>T2: Chapter 3 &amp; 4, T2: Chapter 20, T2: Chapter 24.</b> <b>RBT: L1, L2, L3</b>	
<b>Module 5</b>	
<b>Integration and Component-Based Software Testing:</b> 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. <b>Levels of Testing, Integration Testing:</b> Traditional view of testing levels, Alternative life-cycle models, The SATM system, Separating integration and system testing, A closer look at the SATM system, Decomposition-based, call graph-based, Path-based integrations. <b>T2: Chapter 21 &amp; 22, T1 : Chapter 12 &amp; 13</b> <b>RBT: L1, L2, L3</b>	10
<b>Course Outcomes:</b> The student will be able to : <ul style="list-style-type: none"> <li>• Derive test cases for any given problem</li> <li>• Compare the different testing techniques</li> <li>• Classify the problem into suitable testing model</li> <li>• Apply the appropriate technique for the design of flow graph.</li> <li>• Create appropriate document for the software artefact.</li> </ul>	
<b>Question Paper Pattern:</b> <ul style="list-style-type: none"> <li>• The question paper will have ten questions.</li> <li>• Each full Question consisting of 20 marks</li> <li>• There will be 2 full questions (with a maximum of four sub questions) from each module.</li> <li>• Each full question will have sub questions covering all the topics under a module.</li> <li>• The students will have to answer 5 full questions, selecting one full question from each module.</li> </ul>	
<b>Textbooks:</b> <ol style="list-style-type: none"> <li>1. Paul C. Jorgensen: Software Testing, A Craftsman's Approach, 3<sup>rd</sup> Edition, Auerbach Publications, 2008. (Listed topics only from Chapters 1, 2, 5, 6, 7, 9, 10, 12, 13)</li> <li>2. Mauro Pezze, Michal Young: Software Testing and Analysis – Process, Principles and Techniques, Wiley India, 2009. (Listed topics only from Chapters 3, 4, 16, 17, 20,21, 22,24)</li> <li>3. Aditya P Mathur: Foundations of Software Testing, Pearson Education, 2008.( Listed topics only from Section 1.2 , 1.3, 1.4 ,1.5, 1.8,1.12,6. 2.1,6. 2.4 )</li> </ol>	
<b>Reference Books:</b> <ol style="list-style-type: none"> <li>1. Software testing Principles and Practices – Gopalaswamy Ramesh, Srinivasan Desikan, 2 nd Edition, Pearson, 2007.</li> <li>2. Software Testing – Ron Patton, 2nd edition, Pearson Education, 2004.</li> <li>3. The Craft of Software Testing – Brian Marrick, Pearson Education, 1995.</li> <li>4. Anirban Basu, Software Quality Assurance, Testing and Metrics, PHI, 2015.</li> <li>5. Naresh Chauhan, Software Testing, Oxford University press.</li> </ol>	

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