

Course Name : Computer Engineering Group
Course Code : CO/CD/CM
Semester : Sixth for CO/CM and Seventh for CD
Subject Title : Software Testing
Subject Code : 17624

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	50#	--	25@	175

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

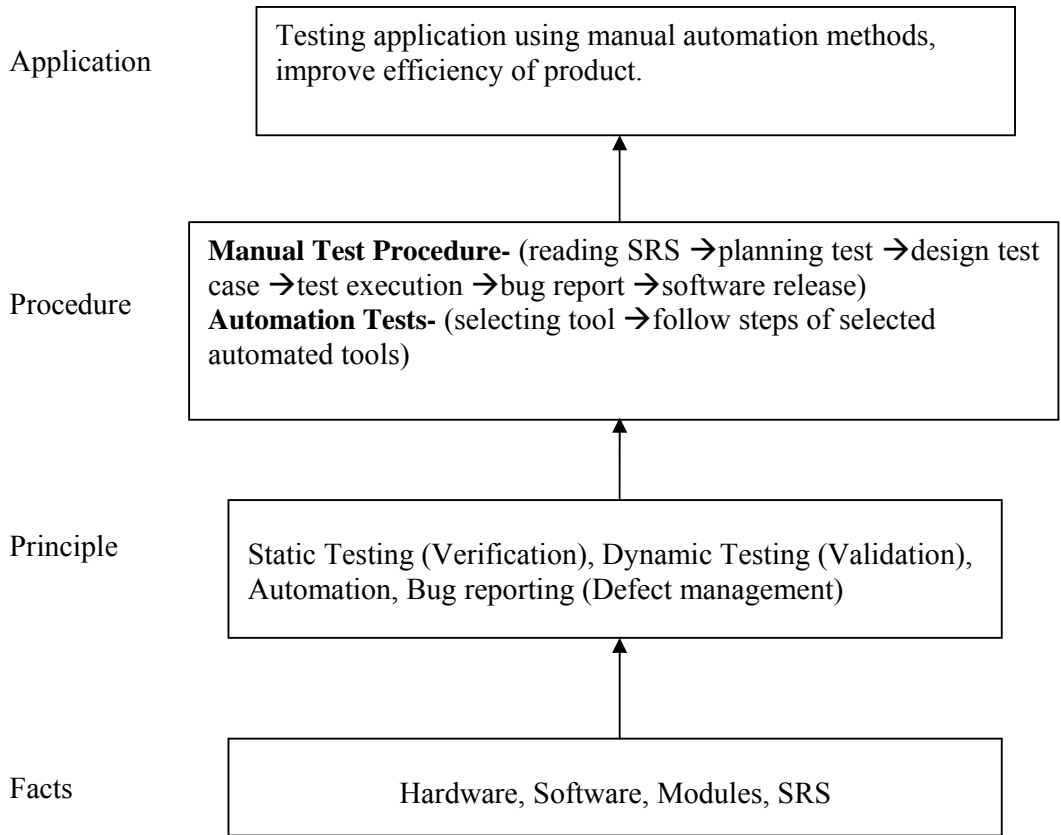
The complexity and size of today's software makes writing secure, bug-free code is extremely difficult, in such a situation testing of software before release is very essential. Software testing can be considered as "Quality Gate" which will pass / release only quality software. Students will learn how to find bugs/errors in any computer program, how to plan an effective test approach, how to clearly report findings and to tell when software is ready to release. Also it introduces various levels and types of testing so that students will be able to practically apply appropriate testing method on application. It also covers manual testing as well as expanding manual test efforts with various automation tools.

Objectives:

Students will be able to:

1. Understand how software testing fits into the software development process.
2. Learn various types and levels of software testing.
3. Develop the skills to find bugs in any type of software.
4. Learn how to effectively plan tests, communicate the bugs you find.
5. Use your new testing skill to test not just the software but also the product specification, the raw code and even the user's manual.
6. Understand STLC, test planning, test case writing and testing execution and defect management.
7. Understand the various automated testing tools to improve testing efficiency.

Learning Structure:



Theory:

Topic No.	Contents	Hours	Marks
1	Basics of Software Testing Objectives: <ul style="list-style-type: none"> ➤ Understand the concept of Software Testing ➤ Understand the importance of Quality Software 1.1 Software Quality, Definition of Software Testing, Role of Testing 1.2 Failure, Error, Fault, Defect, Bug Terminology 1.3 Objectives of Testing 1.4 Test Case 1.5 When to Start and Stop Testing of Software (Entry and Exit Criteria) 1.6 Skills for Software Tester 1.7 Quality Assurance, Quality Control, Verification and Validation, V Model	04	10
2	Types of Testing Objectives: <ul style="list-style-type: none"> ➤ Understand the basic types of testing for software. ➤ Differentiate White box and Black box testing 2.1 White Box Testing : Classification of White Box Testing <ol style="list-style-type: none"> 1. Static Testing- Inspections, Structured Walkthroughs, Technical Review 2. Structural Testing-Code Functional Testing, Code Coverage Testing, Code Complexity Testing 2.1 Black Box Testing: Techniques for Black Box Testing Requirement Based Testing, Positive and Negative Testing, Boundary Value Analysis, Decision Tables, Equivalence Partitioning, User Documentation Testing, Graph Based Testing. Sample Examples on White and Black Box Testing.	08	20
3	Levels of Testing and Special Tests Objectives : <ul style="list-style-type: none"> ➤ Understand the various levels of testing. ➤ Understand some of special tests. 3.1 Unit Testing: Driver, Stub 3.2 Integration Testing: Decomposition Based Testing - Top-Down Integration, Bottom-Up Integration, Bi-Directional Integration, Incremental Integration, Non-Incremental Integration 3.3 System Testing: Recovery Testing, Security Testing, Performance Testing, Load Testing, Stress Testing, Usability Testing, Compatibility Testing 3.4 Acceptance Testing: Acceptance criteria, Alpha Testing an Beta Testing 3.5 Special Tests: Smoke Testing and Sanity Testing, Regression Testing, Usability Testing, GUI Testing, Object Oriented Application Testing: Client-Server Testing, Web based Testing	12	24
4	Test Management Objectives: <ul style="list-style-type: none"> ➤ Design and execute test cases. ➤ Understand the Test Report Process for recommending the product Understand the process of test planning. 	12	20

	<p>➤ Identify resources for test plan implementation and decide the staffing for release.</p> <p>4.1 Test Planning : Preparing a Test Plan, Scope Management, Deciding Test Approach, Setting Up Criteria for Testing, Identifying Responsibilities, Staffing, Training Needs, Resource Requirements, Test Deliverables, Testing Tasks</p> <p>4.2 Test Management: Choice of Standards, Test Infrastructure Management, Test People Management, Integrating with Product Release</p> <p>4.3 Test Process: Base Lining a Test Plan, Test Case Specification, Update of Traceability</p> <p>4.4 Test Reporting: Recommending Product Release. Matrix, Executing Test Cases, Collecting and Analyzing Metrics, Preparing Test Summary Report</p>		
5	<p>Defect Management</p> <p>Objectives:</p> <p>➤ Find, handle and report defect by using standard technique.</p> <p>➤ Understand the Defect life cycle.</p> <p>5.1 Introduction, Defect Classification, Defect Management Process</p> <p>5.2 Defect Life Cycle, Defect Template</p> <p>5.3 Estimate Expected Impact of a Defect, Techniques for Finding Defects, Reporting a Defect</p>	06	14
6	<p>Testing Tools and Measurements</p> <p>Objectives:</p> <p>➤ Understand the shortcomings of manual testing.</p> <p>➤ Understand the use of automated test tools.</p> <p>6.1 Limitations of Manual Testing and Need for Automated Testing Tools</p> <p>6.2 Features of Test Tool: Guideline for Static and Dynamic Testing Tool</p> <p>6.3 Advantages and Disadvantages of Using Tools</p> <p>6.4 Selecting a Testing Tool</p> <p>6.5 When to Use Automated Test Tools, Testing Using Automated Tools</p> <p>6.6 What are Metrics and Measurement: Types of Metrics, Project Metrics, Progress and Productivity Metrics</p>	06	12
Total		48	100

List of Practicals:

Sr. No.	Title of Experiments	No. of Hours
1	Software testing concept, types & methods.	02
2	Study system specification & designing test cases for Inventory & purchase order management.	02
3	Design test cases for college admission form	02
4	Design and write test cases for simple simple calculator application.	02
5	design test cases for Social site (Twitter, Facebook) login form	02

6	Design a set of test cases Pertaining to usage of mobile phone.	02
7	Design test cases for Notepad (MS Window based) Application.	04
8	Design test cases for MS-Paint application.	04
9	Design test cases for Withdrawn of amount from ATM Machine.	04
10	Using an Automated/ computerised tool, Automizing and running test cases for WordPad (MS Windows based).	04
11	Implement test cases for MS Word application using an Automation Tool.	04
Total		32

NOTE: All above Practicals may be performed on Windows or Linux Platform, using the tools mentioned in Table 2 Testing Softwares below.

Learning Resources:

1. Books:

Sr. No.	Author	Title	Publisher
1	Srinivasan Desikan Gopaldaswamy Ramesh	Software Testing: Principles and Practices	PEARSON
2	M. G. Limaye	Software Testing: Principles, Techniques and Tools	Tata McGraw-Hill
3	Naresh Chauhan	Software Testing: Principles and Practices	Oxford

2. Testing Softwares:

Sr. No	Testing Tool	Types of Tools
1	Selenium	Freeware
2	Mantis Bug Tracker	Freeware
3	IBM Rational Functional Tester	Freeware
4	MS-Excel	Commercial
5	Bugzila	--
6	Test Director	--

Note: Other possible available testing tools can be used at institute level.

3. Web Resources:

1. <http://www.selenium.com>
2. http://en.wikipedia.org/wiki/Test_automation
3. http://en.wikipedia.org/wiki/Software_testing#Testing_tools
4. <http://www.softwaretestingsoftware.com>