GUJARAT TECHNOLOGICAL UNIVERSITY

Master in Computer Application (Integrated MCA)

Year IV – (Semester-VII) (W.E.F. June 2016)

Subject Name: Software Testing
Subject Code: 4470631

1. **Learning Objectives :**
   - To be able to understand basics of quality assurance
   - To be able to understand quality models, different testing strategies
   - To be able to understand the mechanism to conduct different levels of testing

2. **Prerequisites**: Software Engineering

3. **Contents :**
   Software quality assurance, Software testing techniques and strategies, test planning, Reporting and bug fixing, Test automation, regression testing

Unit No.	Course Content	No Of Lectures
I	**Introduction to Software Testing** • Software Testing, Approaches to Testing, Testing during SDLC, Requirement Traceability Matric, Essential of Software Testing, Principles and importance of software Testing, Process problems faced by testing • Software Testing Terminology, Software Testing Life Cycle, Software Testing Methodology. • Verification and Validation	06
II	**Testing Techniques: Phase wise** • Dynamic Testing(Black Box Testing) , Static Testing (White Box Testing), • Static Testing: Inspection, Structural walkthrough and Technical Reviews • Validation Activities: Unit Testing, Integration, Function Testing, System testing, Acceptance Testing, Regression Testing • Proposal **Testing**, Requirement Testing, Design Testing, Big Bang Testing, Sandwich testing Critical Path First	08
III	**Testing Techniques: Special Tests** • Security testing, Performance Testing, Installation testing, Regression testing, Smoke testing, Sanity testing, Adhoc Testing, usability testing, COTS Testing etc.	08

IV	**Test Planning, Test Metrics and Reports** **i) Test Planning:** • Test policy, Test Strategy, Test plan, Quality Plan, Test estimation, Test Standards, Build test data and test cases, Test scenarios, Essential activities in testing, Test script, template for test cases, Tools used to build test data, Roles and responsibilities in testing life cycle, Test progress monitoring **ii) Test Metrics:** • Testing related data, defect data, efficiency / productivity data, Estimated, budgeted, Approved and actual, Defect density, Residual Defect density, MTBF/MTTR **iii) Test Reports** • Test Report, Project test status report, Integration Test Report, System test Report, Acceptance Test Report, • Guidelines for Test writing and using test report, Test Status report **IV) Quality Analysis** • Defect Analysis for root cause and corrective actions • Cost of Quality • Orthogonal Defect Classification (ODC)	**10**
V	**Automation and Testing Tools** • Features of testing tools, Guidelines for selecting a tool, Advantages and disadvantage sof using tools • Dynamic and static testing tools • Testing using automated testing tools • Process of procurement of COTS (Readily available tools from Market)	**03**
VI	**Software Testing as per development methodology / model / ecosystem** • TDD • Waterfall • SCRUM • Kanban • DevOps	**02**
VII	**Test Management Tools (*)** • TFS (Microsoft Team Foundation Server) • Jira • Mantis • Open Source and Licensed tools (HP, IBM and others)	**(*)**
VIII	**Roles and Responsibilities (also deliverables) in Software Quality profession** • Quality Assurance engineer • Tester • Test Lead • Test Manager • Scrum Master	**02**

(*): Demo of tools is part of Lab sessions.

4. Text Book:

1. M G Limaye, Software testing Principles, techniques and Tools, McGraw Hill
2. Naresh Chauhan, Software testing Principles and Practices, Oxford University Press

5. Reference Books:

1. Renu Rajani, Pradeep Oak, "Software Testing – Effective Methods, Tools and Techniques", Tata McGraw Hill, Latest Edition.
2. Nina S Godbole, Software Quality Assuarance – Principles and Practice, Narosa Publising house.
3. Srinivasan Desikan and Gopalaswamy Ramesh, " Software Testing – Principles and Practices", Pearson education
4. Aditya P.Mathur, "Foundations of Software Testing", Pearson Education
5. Boris Beizer, "Software Testing Techniques", Second Edition,Dreamtech
6. Elfriede Dustin, "Effective Software Testing", First Edition, Pearson Education

6. Chapter wise Coverage from Text Book:

Unit No	Book#	Chapters
1	1	Chapter 3
	2	Chapter 2,3
2	2	Chapter 4,5,6,7,8
	1	Chapter 9 Pages: 221,222,224,230,231,232
3	1	Chapter 11,12
4	1	Chapter 14, 15
5	1	Chapter 13
6		From online Resources
7		
8		

7. Suggestions for Lab Sessions :

a) **General Guidelines for ERP Practical using Odoo**

- Student must consider own project prepared in previous semester
- Project must have proper documentation
- Project Must contain three Tasks (Team Size 4)
  i. Test planning: Preparation of Test Plan and Quality Plan
  ii. Preparation of Test Cases for various types of cases and Test Data (Minimum 100 Test Scanerios) covering Lifecycle activities.
  iii. Test script and execution of test cases
  iv. Defect reporting by integration with MS excel, Database, Defect management tool and mail application, Test Result Analysis

b) Knowledge about the following is expected to be demonstrated.

- Proper Functional knowledge about the purpose of Software Testing
- List of Testing techniques applied
- Testing tools execution
- Test Plan and Test Case template
- Proper understanding about Testing process and testing tools used
- Proper understanding about Defect, Analysis and Testing result analysis

c) References

d) Suggested Upgrade Points from core modules for Task II and III
PS: Above is a suggestive list so student can identify any task in which they can execute Task b and c.

Part	Course Content	Out put
I	• Test scenario and test case creation and review • Test data creation and update (in line with changes in business rules) • Test execution (manual and automated **Type: Manual and Automated (using Tool)**	Defect Analysis Report
II	• Functional test automation – script creation and execution for a function flow **Type: Manual / Automated (using Tool)**	
III	• Performance testing for functionality for 50 concurrent users **Type:Automated (using Tool)**	• Performance bottleneck analysis report for infrastructure team and product team
IV	• Security testing for architecture, source code and user interface • Vulnerability testing with help of open source and licensed tools • References: www.owasp.org :OWASP guideline compliance verification **Type: Manual / Automated (using Tool)**	• Vulnerability Assessment report

Software Testing Automation Tools - Selenium IDE, JMeter, WebDriver
Scripting: Java, Python

e) Project Document Content

The project has to be well-documented in the form of a Project Report (at least 50 pages), content comprising of as below:

Task	Content
I	**Test Plan, Quality Plan**
II	**Test Cases, test Data, Test Scripts**
III	**Defect Log**

IV	**Testing Result Analysis**

f) Evaluation Parameters :

- Evaluation of the projects would be done considering the test plan, quality plan and testing tools available at the Institute. The main parameter of assessment would be the ability of the students to understand Software Testing process and execution of software testing. Though the project and domain specific knowledge would be not be assessed for, the evaluation would predominantly depend on the students' ability to explain, modify or execute testing.
- Test Case design standards should have been implemented.
- Though the project would be evaluated for the entire team, the examiner should emphasize on the contribution of each team member in the project