



**C. U. SHAH UNIVERSITY**  
**Wadhwan City**

**FACULTY OF:** - Technology and Engineering  
**DEPARTMENT OF:** - Information Technology  
**SEMESTER:** - VIII  
**CODE:** - 4TE08STQ1  
**NAME:** – SOFTWARE TESTING AND QUALITY ASSURANCE

**Teaching & Evaluation Scheme:-**

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
							Marks	Hours	Marks	Hours	Pr/Viva	TW	Pr	
4TE08STQ1	SOFTWARE TESTING AND QUALITY ASSURANCE	3	0	2	5	4	30	1.5	70	3.0	-	20	30	150

**Objectives:**

The objectives of the course are:

- To gain knowledge of different approaches to software quality assurance
- To gain knowledge of the nature of software defects and defect finding
- Be able to record and track defects in your project

**Prerequisites:** Basics of software engineering and mathematics.

**Course outline:**

Sr. No.	Course Contents	Total Hrs.
1	<b>Testing Principles:</b> Testing principles, verification and validation , Need of testing, Basic concepts – errors, faults, defects, failures, test bed, Testing types: white box testing, black box testing, and its types, Testing strategies: unit testing, integration testing system, system testing, regression testing, alpha, beta and acceptance testing , functional testing, performance testing, recovery testing.	08
2	<b>Test Management:</b> Testing Life Cycle – Roles and activities, Test Planning – forming a test team, develop test plan review Test Cases design strategies black box approach: random testing, equivalence class partitioning and boundary value analysis. White box approach: test adequacy criteria, coverage and control flow graphs, paths, loop testing, mutation testing. Test execution: build test data, life cycle of defect, defect tracking, defect detection stages, defect detection stages, defect types, defect severity, defect analysis and prevention.	10
3	<b>Software Metrics:</b> Scope of software metrics, Classifying software measures, Measurement basics – representational theory, scales, GOM technique, Control flow structure, Product quality metrics – MTTF, defect density, customer problems, customer satisfaction, function point, Metrics for software maintenance.	10

<b>4</b>	<b>Software Quality Assurance:</b> Quality concepts – quality, quality control, quality assurance, cost of quality Software quality assurance – SQA activities, software reviews, inspections, audits, Software reviews, Software reliability <b>Quality Attributes:</b> correctness, reliability, usability, integrity, portability, maintainability, interoperability. Basic Tools.	<b>10</b>
<b>5</b>	<b>Quality Standards:</b> Basic concept of – ISO 9000 & 9001, CMM, Six Sigma.	<b>10</b>
<b>Total</b>		<b>48</b>

### Learning Outcomes:

At the end of this module the students will be able to do:

- Understand the effectively strategies of testing, the methods and technologies of software testing
- Design test plan and test cases
- Do automatic testing
- Establish a testing group and manage the whole testing project
- Clearly and correctly report the software defectives
- Asses the software product quality
- Distinguish relationship between the software testing and the quality assurance.

### Books Recommended:

1. Coverage Criteria for Software Testing , **Paul Ammann and Jeff Offutt**, Projected publication, Dec 2007 or Jan 2008.
2. Software Test and Analysis: Process, Principles, and Techniques (Amazon) , **Mauro Pezze and Michal Young**, Wiley publication, 2007
3. Foundations of Software Testing , Aditya P. Mathur. **Pearson Education**, 2007
4. Practical Model-Based Testing: A Tools Approach , **Mark Utting and Bruno Legeard**. Morgan-Kaufmann Publication, 2006
5. Testing and Quality Assurance for Component-Based Software , **Jerry Zeyu Gao, H.-S. Jacob Tsao and Ye Wu**, 2003.
6. Software Testing Techniques by **Boris Beizer**, 1990