

Course Code	Course Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical/Oral	Tutorial	Total
BEITC8046	Software Testing & Quality Assurance	04	02	---	04	01	--	05

Subject Code	Subject Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test 2	Avg. of 2 Tests					
BEITC8046	Software Testing & Quality Assurance	20	20	20	80	25		25	150

Course Objectives: The students will learn

- I. Basic software debugging methods.
- II. White box and Black box testing methods
- III. Writing the testing plans
- IV. Different testing tools

Course Outcomes:

After completion of course the students will able to:

- 1:** Identify the reasons for bugs and analyze the principles in software testing to prevent and remove bugs.
- 2:** Implement various test processes for quality improvement
- 3:** Apply the software testing techniques in commercial environments
- 4:** Provides practical knowledge of a variety of ways to test software and an understanding of some of the trade-offs between testing techniques.
- 5:** Familiar with the open source testing tools.

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours
	Unit-I Testing Methodology	Introduction, Goals of Software Testing, Software Testing Definitions, Model for Software Testing, Effective Software Testing vs Exhaustive Software Testing, Software Failure Case Studies, Software Testing Terminology, Software Testing Life Cycle (STLC), Software Testing methodology, Verification and Validation, Verification requirements, Verification of high level design, Verification of low level design, validation.	10
	Unit II Testing Techniques	Dynamic Testing : Black Box testing: boundary value analysis, equivalence class testing, state table based testing, cause-effect graphing based testing, error guessing. White box Testing Techniques: need, logic coverage criteria, basis path testing, graph matrices, loop testing, data flow testing, mutation testing. Static Testing. Validation Activities: Unit validation, Integration, Function, System, Acceptance Testing. Regression Testing: Progressive vs. Regressive, regression testing produces quality software, regression testability, objectives of regression testing, regression testing types, define problem, regression testing techniques.	12
	Unit III Managing the Test Process	Test Management: test organization, structure and of testing group, test planning, detailed test design and test specification. Software Metrics: need, definition and classification of software matrices. Testing Metrics for Monitoring and Controlling the Testing Process: attributes and corresponding metrics, estimation model for testing effort, architectural design, information flow matrix used for testing, function point and test point	10

		analysis. Efficient Test Suite Management: minimizing the test suite and its benefits, test suite minimization problem, test suite prioritization its type , techniques and measuring effectiveness.	
	Unit IV Test Automation	Automation and Testing Tools: need, categorization, selection and cost in testing tool, guidelines for testing tools. Study of testing tools: WinRunner, QTP, LoadRunner, TestDirector and IBM Rational Functional Tester, Selenium etc.	8
	Unit V Testing for Specialized Environment	Testing Object Oriented Software: OOT basics, Object-oriented testing. Testing Web based Systems: Web based system, web technology evaluation, traditional software and web based software, challenges in testing for web based software, testing web based testing, Testing a data warehouse	5
	Unit VI Quality Management	Software Quality Management, McCall's quality factors and Criteria, ISO 9126 quality characteristics, ISO 9000:2000,software quality management	3

Text Books:

1. Software Testing Principles and Practices Naresh Chauhan Oxford Higher Education
2. Effective Methods for Software Testing , third edition by Willam E. Perry, Wiley Publication
3. Software Testing and quality assurance theory and practice by Kshirasagar Naik, Priyadarshi Tripathy , Wiley Publication
4. Software Testing Concepts and Tools by Nageswara Rao Pusuluri , dreamtech press

References:

1. Foundation of Software Testing 2 e , by Aditya P. Mathur , Pearson publication

2. Software Testing Tools by Dr. K.V.K.K. Prasad , dreamtech press
3. Software Testing Principles, techniques and tools by M.G. Limaye , Mc Graw Hill publication

Term work:

Term work will be based on Practical and Assignments covering the topics of the syllabus.

Suggested Practical List:

1. Write programs in C Language to demonstrate the working of the following
a. constructs: i) do...while ii) while....do iii) if...else iv)switch v) for
2. A program written in C language for Matrix Multiplication fails. Introspect the causes for its failure and write down the possible reasons for its failure.
3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
4. Write the test cases for any known application (e.g. Banking application)
5. Create a test plan document for any application (e.g. Library Management System)
6. Design Test case using boundary value analysis by taking quadratic equation problem.
7. Design a test cases using equivalent class partitioning taking triangle problem
8. Study of any testing tool (e.g. Win runner)
9. Study of any web testing tool (e.g. Selenium)
10. Study of any test management tool (e.g. Test Director)
12. Study of any open source-testing tool (e.g. Test Link)

Theory Examination:

- Question paper will comprise of 6 questions, each carrying 20 marks.
- Total 4 questions need to be solved.
- Q.1 will be compulsory, based on entire syllabus where in sub questions of 2 to 3 marks will be asked.
- Remaining question will be randomly selected from all the modules.

Weight age of marks should be proportional to number of hours assigned to each module.