SCHEME OF COURSE WORK

Course Details:

Course Title	**SOFTWARE QUALITY ASSURANCE AND TESTING**		
Course Code	**15IT2113**	**L P C**	**: 3 0 3**
Program:	**M.Tech**		
Specialization:	**Information Technology**		
Semester	**II**		
Prerequisites	**Software Testing Methodologies**		
Courses to which it is a prerequisite	**Testing Tools**		

Course Outcomes (COs):

1	Design a framework for quality assurance.
2	Evaluate a Software Testing Environment.
3	Classify different Software Testing Techniques.
4	Design the testing process.
5	Test specialized systems.

Program Outcomes (POs):

A graduate of Information Technology will have

1	Ability to demonstrate in-depth knowledge of Software Engineering with analytical and synthesizing skills.
2	Ability to analyze complex problems critically and provide viable solutions.
3	Ability to evaluate potential solutions to a problem and arrive at optimal solutions.
4	Ability to apply research methodologies to develop innovative techniques for solving complex Information Technology related problems.
5	Ability to apply techniques and tools to solve complex problems.
6	Ability to work as an effective team member in a collaborative and multidisciplinary project to achieve common goals.
7	Ability to manage a software team and to maintain financial records as per standards.
8	Ability to effectively communicate with clients, peers and society at large.
9	Ability to take up lifelong learning to be in tune with the fast-changing software related technologies.
10	Ability to follow ethical practices in the software industry and accept social responsibility.
11	Ability to learn independently from mistakes and surge forward with positive attitude and enthusiasm.

Course Outcome Versus **Program Outcomes:**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO-1	M			M	S	M	S	S	M		M
CO-2	S	M			M			M	M		M
CO-3	M	S			S			S	S		S
CO-4	M	M			M		M	S	M		S
CO-5	S			M	S	M	M		S		M

S - Strongly correlated, *M* - *Moderately* correlated, *Blank* - *No correlation*

Assessment Methods:	Assignment / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week	TOPIC / CONTENTS	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Software Quality Assurance, Components of Software Quality Assurance	CO - 1	1.Explain different Components of Software Quality Assurance	▫ Lecture ▫ Demonstration	Assignment (Week 1 - 8) Mid-Test 1 (Week 9)
2	Steps to develop and implement a Software Quality Assurance Plan	CO – 1	1.What is Quality ?Write the steps to develop and implement SQA Plan	▫ Lecture / Discussion ▫ Demonstration	Mid-Test 1 (Week 9)
3	ISO 9000 and Companion ISO Standards	CO – 1	1.Explain in detail about the below standards a)ISO 9000 b)CMMI	▫ Lecture	Assignment (Week 1 - 8) Mid-Test 1 (Week 9)
4	CMM, CMMI, PCMM, Malcom Balridge, 3 Sigma, 6 Sigma	CO – 1	1.Define CMM and explain different levels of CMMI	▫ Lecture	Assignment (Week 1 - 8) Mid-Test 1 (Week 9)
5	Product Quality metrics, In-Process Quality Metrics, Metrics for Software Maintenance, Examples of Metric Programs	CO - 2	1.Write about Product Quality Metrics in detail	▫ Lecture ▫ CaseStudy Discussion	Assignment (Week 1 - 8) Mid-Test 1 (Week 9)
6	Software QualityIndicators,Fundamentals in Measurement Theory	CO – 2	1.Define Software Quality Indicators.What are the fundamentals of Measurement	▫ Lecture / Discussion ▫ Demonstration	Assignment (Week 1 - 8) Mid-Test 1 (Week 9)
7	Writing policy for software testing,Economics of testing,structured approach to software testing, Defects hard to find, Functional and structured testing, Workbench concept, testing tactics check list	CO – 2	1.Explain the Concept of Workbench	▫ Lecture ▫ CaseStudy Discussion	Mid-Test 1 (Week 9)
8	Black-Box, Boundary value, Bottom-up, Branch coverage, Cause-Effect graphing, CRUD, Database, Exception, Gray-Box, Histograms, Inspections, JADs	C0 – 3	1.Write about Boundary Value and Branch coverage testing in detail	▫ Lecture / Discussion ▫ Demonstration	Assignment (Week 1 - 8) Mid-Test 1 (Week 9)
9	**Mid-Test 1**				Assignment (Week 1 - 8) Mid-Test 1 (Week 9)
10	Pareto Analysis, Protogyping, Random Testing, Risk-based Testing, Regression Testing, Structured Walkthroughs, Thread Testing, Performance Testing, White Box Testing	C0 – 3	1.Analyze and write about Whitebox testing in detail	▫ Lecture ▫ Discussion ▫ \	Mid-Test 2 (Week 18)
11	Taxonomy of Testing tools, Methodology to evaluate automated testing tools, Load Runner	C0 – 3	1.Explain the Taxonomy of testing tools	▫ Lecture ▫ CaseStudy Discussion	Mid-Test 2 (Week 18)
12	Win runner and Rational Testing Tools, Java Testing Tools, JMetra, JUNIT and Cactus.	C0 – 3	1.Briefly explain about Java Testing Tools	▫ Lecture / Discussion ▫ Demonstration	Mid-Test 2 (Week 18) Assignment (Week 10-16)
13	Testing Process Part 1:Advantages of following a process,Cost of Computer testing	C0 – 4	1.What are the Advantages of following a process	▫ Lecture / Discussion ▫ Demonstration	Assignment (Week 10- 16)
14	Seven step software testing process,Define the scope of testing	C0 – 4	1.Write the seven steps of software testing process	▫ Lecture ▫ CaseStudy Discussion	Seminar Mid-Test 2 (Week 18)
15	Developing the test plan,Verification testing	C0 – 4	1.Write in detail about Verification testing	▫ Lecture / Discussion ▫ Demonstration	Seminar (Week 10-16) Mid-Test 2

					(Week 18)
16	Testing Client/Server – Web applications,Testing COTS and contracted software	CO – 5	1.Explain about Testing client/server system	▫ Lecture / Discussion ▫ Demonstration	Seminar
17	Testing Security, Testing a Data Warehouse	CO – 5	1.Explain about Testing a data warehouse	▫ Lecture ▫ CaseStudy Discussion	Assignment (Week 10- 16) Mid-Test 2 (Week 18)
18	**Mid-Test 2**				
19/20	**END EXAM**				