CS – 10: SAD, Software Quality Assurance and Testing

Objectives:

- To Understand and explore concept of System Analysis
- To Understand concept of System Development Life Cycle
- To Understand Quality Assurance
- To Understand concept of Software Testing
- To explore the concept of Project Tracking and Scheduling
- To Understand the concept of Quality Control and Testing
- To Understand the software models and Automated Testing
- To Understand the UML Diagram
- To Understand the concept of CAD Project Management

Prerequisites:

- Problem-Solving Skills
- Basic concepts of Database
- Basic knowledge of Software Development Fundamentals

Unit No.	Topics	Details
1	**System Analysis & Design, Software Engineering & Concept of Quality Assurance**	• Definitions: System, Subsystem, Business System, Information System (Definitions only) • Systems Analyst (Role: Information Analyst, Systems Designer & Programmer Analyst) • SDLC • Fact – finding techniques (Interview, Questionnaire, Record review and observation) • Tools for Documenting Procedures and Decisions Decision Trees and Decision Tables • Data Flow analysis Tool DFD (context and zero level) and Data Dictionary • Software Engineering (Brief introduction) • Introduction to QA • Quality Control (QC) • Difference between QA and Q • Quality Assurance activities

2	**Basics of Software Testing, Types of Software Testing, Verification and Validation**	• Introduction to software Testing
		• Software faults and failures
		  • Bug/Error/Defect/Faults/Failures
		• Testing Artifacts
		  • Test case
		  • Test Script
		  • Test Plan
		  • Test Harness
		  • Test Suite
		• Static Testing
		  • Informal Review
		  • Walthrough
		  • Technical Review
		  • Inspection
		• Dynamic Testing
		• Test levels
		  • Unit Testing
		  • Integration Testing
		  • System Testing
		  • Acceptance Testing
		Techniques of software Testing
		• Black Box Testing
		  • Equivalence Partitioning
		  • Boundary Data Analysis
		  • Decision Table Testing
		  • State Transition Testing
		• White Box Testing
		  • Statement testing and coverage
		  • Decision testing and coverage
		• Grey Box Testing
		• Nonfunctional Testing
		  • Performance Testing
		  • Stress Testing
		  • Load Testing
		  • Usability Testing
		  • Security Testing

3	**Software Development Life Cycle Models and Automated Testing**	• Waterfall Model
		• Iterative Model
		• V-Model
		• Spiral Model
		• Big Bang Model
		• Prototyping Model
		• Introduction to Automated Testing
		  • Concept of Freeware, Shareware, licensed tools
		• Theory and Practical Case-Study of Testing Tools
		  • Selenium
		  • Neoload
		  • Junit
		  • Nunit
		  • Acunetix
		  • ZAP

4	**Project Economics, Project scheduling and Tracking**	• Concepts of Project Management • Project Costing based on metrics • Empirical Project Estimation Techniques. • Decomposition Techniques. • Algorithmic methods. • Automated Estimation Tools • Concepts of project scheduling and tracking • Effort estimation techniques • Task network and scheduling methods • Timeline chart • Pert Chart • Monitoring and control progress • Graphical Reporting Tools

5	**CAD Project Management Tool UML**	• MS – VISIO for designing & Documentation • MS – Project for controlling and Project Management • UML designing and skill based tools Overview of ♦Class Diagram ♦Use Case Diagram ♦Activity Diagram

Student seminar - 5 Lectures.
Expert Talk - 5 Lectures
Students Test - 5 Lectures.
TOTAL LECTURES 60+15=75

Reference Books

1. Analysis & Design of Information System - James A. Senn.
2. Pankaj Jalote, "Software Engineering – A Precise Approach", Wiley India
3. UML Distilled by Martin Fowler, Pearson Edition, 3rd Edition
4. Fundamentals of Software Engineering – RajibMall (PHP)
5. Software Engineering – A Practitioner's Approach – Pressman
6. UML – A Beginner's Guide –Jasson Roff – TMH
7. Roger Pressman , "Software Engineering"
8. http://en.wikipedia.org/wiki/Software_testing
9. http://www.onestoptesting.com/
10. http://www.opensourcetesting.org/functional.php

Course Outcome

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