

B.C.A. (Honours) & B.C.A. (Honours with Research)
(Semester - 1 and Semester - 2)
Saurashtra University
To be effective from June – 2023



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	<ul style="list-style-type: none"> • 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

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2	Basics of Software Testing, Types of Software Testing, Verification and Validation	<ul style="list-style-type: none"> • Introduction to software Testing • Software faults and failures <ul style="list-style-type: none"> • Bug/Error/Defect/Faults/Failures • Testing Artifacts <ul style="list-style-type: none"> • Test case • Test Script • Test Plan • Test Harness • Test Suite • Static Testing <ul style="list-style-type: none"> • Informal Review • Walthrough • Technical Review • Inspection • Dynamic Testing • Test levels <ul style="list-style-type: none"> • Unit Testing • Integration Testing • System Testing • Acceptance Testing <p>Techniques of software Testing</p> <ul style="list-style-type: none"> • Black Box Testing <ul style="list-style-type: none"> • Equivalence Partitioning • Boundary Data Analysis • Decision Table Testing • State Transition Testing • White Box Testing <ul style="list-style-type: none"> • Statement testing and coverage • Decision testing and coverage • Grey Box Testing • Nonfunctional Testing <ul style="list-style-type: none"> • Performance Testing • Stress Testing • Load Testing • Usability Testing • Security Testing
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3	Software Development Life Cycle Models and Automated Testing	<ul style="list-style-type: none"> • Waterfall Model • Iterative Model • V-Model • Spiral Model • Big Bang Model • Prototyping Model • Introduction to Automated Testing <ul style="list-style-type: none"> • Concept of Freeware, Shareware, licensed tools • Theory and Practical Case-Study of Testing Tools <ul style="list-style-type: none"> • Selenium • Neoload • Junit • Nunit • Acunetix • ZAP
4	Project Economics, Project scheduling and Tracking	<ul style="list-style-type: none"> • 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

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5	CAD Project Management Tool UML	<ul style="list-style-type: none">• MS – VISIO for designing & Documentation• MS – Project for controlling and Project Management• UML designing and skill based tools Overview of <ul style="list-style-type: none">◆ Class Diagram◆ Use Case Diagram◆ Activity Diagram
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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

- Able to Understand and explore concept of System Analysis
- Able to Understand concept of System Development Life Cycle
- Able to Understand Quality Assurance
- Able to Understand concept of Software Testing
- Able to Explore the concept of Project Tracking and Scheduling
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