H.N.G. University, Patan
M.C.A(5 Years Integrated Programme) SEMESTER - VII
702 : Software Testing & Quality Assurance

Unit : 1 **[20%]**

Software Quality: Definition, Defects, Faults, Failures, Software Quality Attributes- correctness, reliability, usability, integrity, portability, maintainability, interoperability.

Quality concepts: quality, quality control, quality assurance, cost of quality.

Quality assurance: SQA activities, Overview of Different Types of Software Review, Ishikawa's Seven Basic Tool.

Unit : 2 **[20%]**

Product Quality Metrics: MTTF, Defect Density, Customer Problems Metric, Customer Satisfaction Metrics, Function Points.

In-Process Quality Metrics: Defect Arrival Pattern, Phase-Based Defect Removal Pattern, Defect Removal Effectiveness.

Metrics for Software Maintenance: Backlog Management Index, Fix Response Time, Fix Quality, Software Quality Indicators.

Quality Standards – ISO 9000 & 9001, CMM, six sigma.

Unit : 3 **[20%]**

Testing Basics: Introduction, Basics of Software Testing, Testing Principles, Goals, Testing Life Cycle, Planning – forming a test team, develop test plan review, Test Cases design strategies, Testing level, Testing approach.

White box testing,: static testing- static analysis tools, Structural testing- Unit/Code functional testing, Code coverage testing, Code complexity testing.

Black Box testing: Requirements based testing, positive and negative testing, Boundary value analysis, Equivalence partitioning, state/graph based testing, Model based testing and model checking.

Unit : 4 **[30%]**

Integration Testing: Top down and Bottom up integration, Bi-directional integration, System integration, Scenario Testing, Defect Bash.

System, Testing :Functional , Non-functional testing, Design/Architecture verification, Deployment testing, Beta testing, Scalability testing, Reliability testing, Stress testing.

Acceptance testing: Acceptance criteria, test cases selection and execution.

Regression testing: Overview, Regression test process, Initial Smoke or Sanity test, Selection of regression tests, Execution Trace, Dynamic Slicing, Test Minimization, Tools for regression testing.

Ad hoc Testing: Pair testing, Exploratory testing, Iterative testing, Defect seeding.
Performance Testing: Introduction, Methodology, Tools, Process.

Unit : 5 **[10%]**

Eleven Step Testing Process: Assess Project Management Development Estimate and Status, Develop Test Plan, Requirements Phase Testing, Design Phase Testing, Program Phase Testing, Execute Test and Record Results, Acceptance Test, Report test results, testing software installation, Test software changes, Evaluate Test Effectiveness.

Testing Tools: Manual testing, Automated Testing Tools, overview of Testing tools (QTP, Rational Robot, Winrunner, Loadrunner), Manual testing Vs Automated testing.

Testing metrics: project , progress, productivity.

Text Books:

1. Software Testing: Principles and Practices
   Author: Srinivasan Desikan, Gopalaswamy Ramesh, Publication: Pearson Education
2. Effective Methods for Software Testing, 2nd Edition
   Author: William E. Perry, Publication:Wiley India, 2006.
3. Software Quality
   Authors: Mordechai Ben-Menachem / Garry S. Marliss, Publication: Thomson Learning

Reference Books:

1. Metrics and Models in Software Quality Engineering
   Author: Stephen H. Kan, Publication: Addison Wesley
2. Software Testing Tools
   Author: Dr. K.V.K.K Prasad, Publication: Dreamtech press