



## QUALITY ASSURANCE (QA)

Nature of the Course: Theory + Practical

Total Hours per Day: 2 Hours

Course Duration: 4 Weeks

### Course Summary

The course is structured to assist students in learning key topics in Software Quality Assurance, such as software testing objectives, processes, criteria, strategies, and methodologies. The course also covers subjects like how to create test cases and test data, how to execute testing operations, how to manage software problems and defects, software test automation using real-world examples, and how to perform software security and performance testing.

### Completion Criteria

After fulfilling all of the following criteria, the student will be deemed to have finished the Module:

- Has attended 90% of all classes held.
- Has received an average grade of 80% on all assignments
- Has received an average of 60% in assessments.
- The tutor believes the student has grasped all of the concepts and is ready to go on to the next module.

### Required Textbooks

- Sagar Naik and Piyu Tripathy, “Software Testing and Quality Assurance”, Wiley.
- Cem Kaner, Jack Falk and H.Q. Nguyen, “Testing Computer Software”, Wiley.

### Prerequisites

- Fundamental understanding of programming, bits/bytes, procedures, classes, and computer architecture. It's absolutely acceptable if you only have a theoretical understanding of programming, but you

should be certain about what programming is and what you intend to gain from this session.

- If you are only interested in theory and have no interest/patience in spending at least 10 hours every week throughout the duration of the course, then this course might not be for you.
- If you have absolutely no idea about programming or do not see yourself doing programming in the next six -odd months, then this class may not be for you.

## **Course Details**

### **Week I**

#### **Introduction To Quality Assurance**

- Importance of QA / QA as a career
- Difference between Project and Product
- Difference between Quality Assurance and Quality Control
- Manual and Automated Testing
- Roles and Responsibilities of Business Analyst, Developers, Architects, Project Managers, Quality Assurance.
- Test Team (QA Manager, QA Lead, QA Engineer, Release Engineer)

#### **Software Development Life Cycles (Sdlc)**

- Stages of Software Development Life Cycle.
- Agile Methodologies
- Software Testing Life Cycles
- Types of Testing
- Test Platforms (Development, QC, UAT, Production)
- Defects (Identification, Logging, Life Cycle Priority)
- Defect Life Cycle

### **Week II**

#### **Quality Assurance Phases**

- Feature Requirement Analysis
- Test Plan
- Test Scenario
- Test Cases
- Test Data
- Test Script

- Decision Table
- Test Result
- QA Process Cycle

## **Python Programming Basics**

- Comment in Python
- Main Function
- Function Definition and Function Call
- If-Else, For Loop
- Indent
- Assert

## **Automation Testing – Basics**

- Introduction to Automation Testing
- What is Automation Testing
- Benefits of Automation Testing
- Introduction to Selenium
- XPath, its types and Examples
- Web Driver and its Action

## **Week III**

### **Automation Testing – Advanced**

- Introduction to Automation Framework
- Accessing Multi-URL via Automation
- Read Input Parameters from Excel
- Importing Data from Web (Web Scraping)
- Write Web Data to Excel
- Read Keyword and XPath from Excel File
- Write Automation Test Result to Excel File

### **Test Script, Database And Sql – Basics**

- Importance of SQL in Quality Assurance
- Introduction to Database
- Database Verification and Validation
- MySQL Database, Comparison with Popular Databases: Oracle, MS SQL Server, IBM DB2.
- Structured Query Language (SQL)
- Data Definition Language (DDL)

- Data Manipulation Language (DML)
- Introduction to Tables, Rows, Columns
- Foreign Keys, Primary Key and Unique Key
- DDL and DML, Select, Update, Delete and Insert into Statements

## **Week IV**

### **Performance Test – Basics**

- Performance Testing and its Importance in QA
- Types of Performance Testing
- API Testing with GET, POST, Delete, and PUT Methods
- Common Performance Problems
- Performance Testing Process
- Example Performance Test Cases
- Performance Test Using JMeter
- Performance Test report generation

### **Security Test – Basics**

- Security Testing and its Importance in QA
- Types of Security Testing
- Authentication and Authorization
- Example Test Scenarios for Security Testing
- Methodologies/ Approach / Techniques for Security Testing
- SQL Injection and XSS (Cross-Site Scripting)

### **Labs**

- Test Scenario Preparation
- Test Case Preparation
- Test Data Preparation
- Decision Table Preparation
- BDD Examples Practice
- Test Script Preparation (SQL)
- Browsing Web via Automation
- Data Validation via Automation
- Web Scraping using Selenium
- Accessing Multiple URLs using Selenium
- Create Keyword Driven Automation Framework
- Create Automation Test Result in Excel

- Performance Test using JMeter

### **Learning Outcomes**

- Learn how to create and implement a software quality assurance plan for all software initiatives.
- How to form a software quality assurance team and manage it.
- How to monitor and maintain quality, create and maintain relevant metrics.
- Learn how to implement a software quality assurance program in an agile context including iterative and incremental development.