



Software Testing and Test Automation – *Comprehensive Curriculum*

Course Overview

This 14-week course is designed for comprehensive understanding of software testing principles and methodologies. Idea is to coach the learners on mastering manual testing and test automation techniques in line with latest trends of corporate world. We mentor the learners to understand how to use Gen AI when using the tools and technologies in their job.

❖ **Assessment and Evaluation**

- Weekly quizzes
- Practical assignments
- Capstone Project
- ISQTB certification mock tests

❖ **Recommended Tools and Software**

- Visual Studio Code
- Git
- Python / Java / JavaScript
- Selenium WebDriver
- Cypress
- Postman
- JMeter
- Docker
- Jenkins

❖ **Learning Outcomes:**

- By end of this course, learners will
 - Understand fundamental testing concepts, levels, types (including automation), and the Software Testing Lifecycle, recognizing its role in quality.
 - Develop practical skills in manual and **automation** test planning, design, execution, and defect management, utilizing relevant tools.
 - Analyse requirements to create effective manual and **automated** tests, prioritize efforts, evaluate coverage, and troubleshoot defects.
 - Cultivate professional skills like teamwork, clear communication, ethical awareness, and a commitment to continuous learning in both manual and **automation** testing.



Curriculum Breakdown

❖ **Week 1-2: Foundations of Software Testing**

○ **Module 1: Introduction to Software Testing**

- ✓ Definition and importance of software testing
- ✓ Types of software testing
- ✓ Functional vs. Non-functional testing
- ✓ Black box, white box, and Gray box testing
- ✓ Software development life cycle (SDLC) and testing
- ✓ Quality assurance vs. quality control
- ✓ Testing principles and best practices

○ **Module 2: Testing Methodologies**

- ✓ Agile testing methodologies
- ✓ Test-Driven Development (TDD)
- ✓ Behaviour-Driven Development (BDD)
- ✓ Continuous Integration and Continuous Testing
- ✓ Risk-based testing approaches

❖ **Week 3-4: Test Design and Techniques**

○ **Module 3: Test Case Design**

- ✓ Equivalence partitioning
- ✓ Boundary value analysis
- ✓ Decision table testing
- ✓ State transition testing
- ✓ Error guessing techniques
- ✓ Exploratory testing strategies

○ **Module 4: Functional and Non-Functional Testing**

- ✓ Functional testing techniques
- ✓ Performance testing fundamentals
- ✓ Security testing basics
- ✓ Usability testing principles
- ✓ Compatibility and accessibility testing
- ✓ Mobile and web application testing considerations



❖ Week 5-6: Test Automation Foundations

- **Module 5: Introduction to Test Automation**
 - ✓ Test automation strategy and planning
 - ✓ Selecting appropriate test cases for automation
 - ✓ ROI calculation for test automation
 - ✓ Tools and framework selection criteria
 - ✓ Best practices in test automation
- **Module 6: Programming for Test Automation**
 - ✓ Programming fundamentals for testers
 - ✓ Basic programming concepts
 - ✓ Object-oriented programming principles
 - ✓ Version control with Git
 - ✓ Introduction to (any two only):
 - Python (basics)
 - Java (basics)
 - JavaScript (basics)

❖ Week 7-8: Advanced Test Automation Frameworks

- **Module 7: Web Application Test Automation** (any two tools will be covered)
 - ✓ Selenium WebDriver
 - Installation and setup
 - Locator strategies
 - Page Object Model design pattern
 - Handling dynamic elements
 - Cross-browser testing
 - ✓ Cypress
 - Modern web application testing
 - Real-time reloading
 - Automatic waiting mechanisms
 - ✓ Playwright
 - Cross-browser web automation
 - Mobile web testing



- **Module 8: API Testing Automation**

- ✓ REST API testing fundamentals
- ✓ Postman for API testing
- ✓ Rest-Assured framework
- ✓ API test automation strategies
- ✓ Contract testing
- ✓ Mock services and stub creation

- ❖ **Week 9-10: Specialized Testing Domains**

- **Module 9: Mobile and Native App Testing**

- ✓ Mobile testing strategies
- ✓ Appium for mobile test automation
- ✓ iOS and Android test automation
- ✓ Emulators and real device testing
- ✓ Performance testing for mobile apps

- **Module 10: Performance and Load Testing**

- ✓ Performance testing concepts
- ✓ JMeter for load testing
- ✓ Gatling framework
- ✓ Performance test design
- ✓ Analyzing performance metrics
- ✓ Continuous performance testing

- ❖ **Week 11-12: DevOps and Advanced Testing**

- **Module 11: Continuous Testing in DevOps**

- ✓ Jenkins for test automation
- ✓ Docker for test environment management
- ✓ Kubernetes integration
- ✓ Cloud-based testing platforms
- ✓ Test environment provisioning



- **Module 12: Test Reporting and Management**

- ✓ Reporting tools and techniques
- ✓ Test management platforms (TestRail, Zephyr)
- ✓ Defect tracking systems
- ✓ Test analytics and metrics
- ✓ Test result visualization

❖ **Week 13-14: Capstone Project and Certification Preparation**

- **Module 13: Comprehensive Test Automation Project**

- ✓ Real-world project implementation
- ✓ End-to-end test suite development
- ✓ Integration of multiple testing techniques
- ✓ Code review and best practices

- **Module 14: Certification and Career Preparation**

- ✓ ISTQB certification preparation
- ✓ Resume building for test automation
- ✓ Interview preparation
- ✓ Industry trends and career paths
- ✓ Professional networking strategies