SOFTWARE QUALITY ASSURANCE AND AUTOMATED TESTING COURSE

Introduction

This programme equips participants with the knowledge and practical skills to assure software quality across the development lifecycle and to design, build and maintain automated test suites. It covers quality standards and processes, test planning and design techniques, manual and automated testing, API and performance testing, and the integration of automated checks into CI/CD pipelines. Participants work hands-on with industry tools such as Selenium, Playwright, Postman, JIRA and JMeter, and learn to measure and report quality with metrics that leadership can act on. By the end of the course, participants can set up a test strategy, automate repetitive testing and embed quality assurance in their organisation's software projects.

Course Objectives

- Explain software quality assurance concepts, standards and the role of QA across the software development lifecycle.
- Develop test strategies, test plans and test cases using recognised test design techniques.
- Execute manual functional, regression, usability and exploratory testing and report defects effectively.
- Design and build automated test scripts for web applications using tools such as Selenium and Playwright.
- Test APIs and services with Postman and automate API regression checks.
- Integrate automated tests into CI/CD pipelines for continuous testing.
- Carry out basic performance and security testing and interpret the results.
- Manage testing work, defects and traceability with tools such as JIRA, and report quality using metrics and dashboards.

Course Modules

> Module 1: Foundations of Software Quality Assurance
- Quality assurance, quality control and testing: roles and boundaries.
- The cost of poor quality and the business case for QA.
- QA across the SDLC: waterfall, agile and DevOps delivery.
- Standards and vocabulary: ISO/IEC 25010 quality characteristics and ISTQB terms.
- Quality gates, entry and exit criteria.

> Module 2: Test Planning and Test Design Techniques
- Test policy, test strategy and the test plan.
- Risk-based testing and prioritisation.
- Equivalence partitioning and boundary value analysis.
- Decision tables, state transition and use-case testing.
- Requirements traceability and coverage.

> Module 3: Manual Testing in Practice
- Functional, regression, smoke and sanity testing.
- Exploratory and usability testing sessions.
- Writing clear, reproducible defect reports.
- Defect lifecycle, severity and priority.
- User acceptance testing with business stakeholders.

> Module 4: Test Management, Metrics and Tools
- Organising test cycles, suites and test data.
- Managing testing work and defects in JIRA.
- Quality metrics: coverage, defect density, defect escape rate.
- Dashboards and reporting to project leadership.
- Documentation that auditors and clients expect.

> Module 5: Introduction to Test Automation
- What to automate and what to keep manual: the automation pyramid.
- Selecting automation tools and frameworks.
- Setting up the automation environment.
- Locators and selectors: finding elements reliably.
- Writing a first automated test.

> Module 6: Web Test Automation with Selenium and Playwright
- Writing and structuring automated web tests.

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- Waits, synchronisation and flaky-test prevention.
- The page object model and reusable components.
- Data-driven and cross-browser testing.
- Organising and running automated suites.

> Module 7: API Testing and Automation
- HTTP and REST fundamentals for testers.
- Postman collections, environments and variables.
- Assertions and test scripts for API responses.
- Automating API regression suites.
- Mocking and testing integrations.

> Module 8: Continuous Testing in CI/CD Pipelines
- Version control essentials for QA teams.
- Running automated suites in pipelines (GitHub Actions, Jenkins).
- Test reports, failure triage and re-runs.
- Quality gates that block bad releases.
- Shift-left testing and developer collaboration.

> Module 9: Performance and Security Testing Essentials
- Load, stress and endurance testing concepts.
- Building and running tests with JMeter.
- Interpreting response times, throughput and error rates.
- Security testing basics and the OWASP Top 10 for testers.
- Reporting performance and security findings.

> Module 10: Quality Reporting and End-to-End Course Project
- Building a test strategy for a case application.
- Implementing combined manual and automated coverage.
- Running the suite in a pipeline and reading the results.
- Presenting quality status to stakeholders.
- Personal action plan for applying QA at work.