End-to-End QA Automation and DevOps Testing

Duration: 10 days
Prerequisites: Basics of Software Testing, API testing, and Knowledge of Programming Fundamentals

Day 1 – Introduction to Test Automation & Selenium

- Overview of Automation Testing in SDLC
- Benefits and Challenges of Automation
- Selenium Ecosystem (IDE, WebDriver, Grid)
- Selenium Architecture and WebDriver Components
- Setting Up Selenium with Java
- Locators and Web Elements (ID, XPath, CSS Selectors)
- **Lab:** Automate simple form submission using Selenium WebDriver

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Day 2 – Selenium Advanced Concepts

- Handling Dynamic Web Elements
- Alerts, Frames, Windows, and Dropdowns
- Actions Class (Mouse & Keyboard Events)
- Synchronization (Implicit, Explicit, Fluent Waits)
- Capturing Screenshots & Logs
- **Lab:** Automate multi-page navigation and validation flow

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Day 3 – Selenium Framework Design

- Introduction to TestNG / JUnit
- Data-Driven Testing with Excel/CSV
- Page Object Model (POM) Design Pattern
- Parameterization & Parallel Execution
- TestNG Annotations, Groups, Reports
- **Lab:** Build a POM-based Selenium Framework

Day 4 – Selenium Integration with Tools

- Integrating Selenium with Maven/Gradle
- Logging & Reporting (Log4j, Extent Reports)

- Continuous Test Execution using Jenkins
- Running Selenium on Selenium Grid
- Debugging and Best Practices
- **Lab:** Schedule Selenium test execution via Jenkins

Day 5 – API Testing (Manual & Automation)

- Introduction to APIs and HTTP Methods (GET, POST, PUT, DELETE)
- REST vs SOAP
- Using Postman for Manual API Testing
- API Test Scenarios and Validation
- API Automation with Rest Assured (Java) or Python Requests
- JSON Schema Validation and Response Assertion
- **Lab:** Automate API validation using Rest Assured

WEEK 2 – JMeter & CI/CD DevOps Testing

Day 6 – Performance Testing Fundamentals

- Introduction to Non-Functional Testing
- Performance, Load, and Stress Testing Concepts
- JMeter Installation & UI Overview
- Building a Basic HTTP Test Plan
- Understanding Thread Groups, Samplers, Listeners
- **Lab:** Execute first load test with JMeter

Day 7 – JMeter Advanced Concepts

- Correlation and Parameterization in JMeter
- Assertions and Timers
- CSV Data Config & Dynamic Inputs
- Distributed Load Testing with JMeter
- JMeter CLI and Integration with Jenkins
- **Lab:** Create a parameterized load test and generate reports

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Day 8 – CI/CD and DevOps Testing Concepts

- Introduction to DevOps for QA Engineers
- CI/CD Lifecycle Overview
- Role of Test Automation in CI/CD
- Jenkins Setup for Test Automation
- Integrating Selenium, JMeter, and API Tests in Jenkins Pipeline
- **Lab:** Implement test pipeline using Jenkins + GitHub

Day 9 – Containerized Testing Basics

- Basics of Docker for Test Automation
- Creating Dockerfile for Test Environments
- Running Selenium Grid with Docker Compose
- Version Control Integration (Git/GitHub)
- **Lab:** Run Selenium tests on Dockerized Grid

Day 10 – Test Reporting and Best Practices

- Generating Comprehensive Reports (TestNG, Extent, JMeter)
- Result Analysis and Defect Identification
- Metrics and KPIs for Test Automation and Performance Testing
- Test Maintenance and Scalability Strategies