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Course Title
Automation & Software Testing Course

Course Overview
This course provides a comprehensive introduction to software testing and automation practices used in modern software development. The course covers the fundamental principles of software testing, manual testing techniques, test case design, and automation testing using industry-standard tools.
Participants will learn how to identify software defects, create test plans, write effective test cases, and automate testing processes using tools such as Selenium. The program also introduces API testing, bug tracking systems, and testing frameworks using programming languages such as Java, C#, Python, and JavaScript.
By the end of the course, students will gain practical knowledge of software testing processes and automation tools used in real-world development environments, preparing them for industry certifications and software testing careers.

Module 1: Introduction to Software Testing
Topics:
- Introduction to software testing and quality assurance
- Importance of software testing in the development lifecycle
- Software Development Life Cycle (SDLC)
- Software Testing Life Cycle (STLC)
- Types of software testing (functional and non-functional testing)
- Black-box testing and white-box testing concepts
- Static testing vs dynamic testing
- Role of a software tester in development teams

Module 2: Manual Testing and Test Case Development
Topics:
- Fundamentals of manual testing
- Requirement analysis for testing
- Writing effective test cases and test scenarios
- Test case design techniques
- Boundary value analysis
- Equivalence partitioning techniques
- Exploratory testing techniques
- Test documentation and reporting

Module 3: Test Planning and Test Execution
Topics:
- Introduction to test planning processes
- Creating test strategies and test plans
- Test environment setup

- Test execution processes
- Test result documentation
- Test reporting and defect tracking
- Risk analysis and test management
- Managing testing workflows in development teams

Module 4: Automation Testing Fundamentals
Topics:
- Introduction to automation testing
- Benefits of test automation
- Overview of automation testing tools
- Introduction to Selenium automation framework
- Selenium architecture and components
- Web driver concepts and browser automation
- Identifying web elements and automation scripts
- Automation testing best practices

Module 5: Automation Testing with Programming Languages
Topics:
- Programming fundamentals for automation testing
- Using Java for test automation
- Using Python for automation scripting
- Using JavaScript for web testing automation
- Using C# for automation testing frameworks
- Writing automated test scripts
- Integrating automation with testing frameworks
- Executing automated test cases

Module 6: API Testing Fundamentals
Topics:
- Introduction to API testing
- Understanding REST APIs and web services
- HTTP methods and status codes
- API request and response structures
- API testing tools and platforms
- Writing and executing API test cases
- Validating API responses and performance
- API automation basics

Module 7: Bug Reporting and Tracking Tools
Topics:
- Introduction to defect management
- Identifying and documenting software defects

- Bug life cycle and defect workflows
- Writing effective bug reports
- Using bug tracking tools (Jira, Bugzilla, etc.)
- Managing defects in agile environments
- Communication between testers and developers
- Tracking and resolving software issues

Module 8: Certification Preparation and Industry Practices
Topics:

- Overview of software testing certifications
- ISTQB certification fundamentals
- Industry standards and testing frameworks
- Agile testing methodologies
- Continuous testing in DevOps environments
- Automation testing best practices
- Interview preparation for software testing roles
- Career paths in software testing and quality assurance

Capstone Project: Automation Testing Implementation

During the final phase of the course, participants will work on a practical software testing project where they will analyze a sample application, create test plans and test cases, perform manual testing, and develop automated test scripts using Selenium and programming languages.

Students will execute test scenarios, report defects using bug tracking tools, and demonstrate how automation frameworks can improve software testing efficiency. This project will provide hands-on experience with real-world testing workflows used in modern software development environments.

Recommended Resources
Books

- Foundations of Software Testing — Rex Black
- Selenium WebDriver Practical Guide — Unmesh Gundecha
- Lessons Learned in Software Testing — Cem Kaner