Android Application Testing

Course Duration: 24 Hours **Course code: AAT**

1. Course Overview

This course provides participants with the knowledge and practical skills to test Android applications effectively. It covers manual and automated testing approaches, tools, frameworks, and best practices to ensure app functionality, performance, usability, and security.

2. What you'll learn?

- Understand the Android testing ecosystem and methodologies.
- Perform manual and automated testing for Android apps.
- Use frameworks like JUnit, Espresso, UI Automator, and Appium.
- Conduct functional, UI, performance, and security testing.
- Identify, report, and track defects effectively.
- Integrate testing practices into the development lifecycle.

3. Target Audience

- Android developers aiming to improve testing skills.
- QA engineers and testers focusing on mobile applications.
- IT professionals and students interested in mobile app quality assurance.
- Teams looking to implement automated testing in Android projects.

4. Pre-Requisites

- Basic knowledge of Android development and Android Studio.
- Familiarity with Java or Kotlin programming.
- Understanding of software development lifecycle (SDLC) concepts.

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5. Course content

Module 1: Introduction to Android Testing

- Importance of testing in mobile development
- Types of testing: manual vs automated, functional vs non-functional
- Android testing architecture and tools
- Setting up the testing environment

Module 2: Manual Testing

- Test case creation and test plan development
- Functional testing: activities, layouts, and navigation
- UI/UX testing and usability testing
- Exploratory testing and edge cases
- Hands-on lab: Manual testing of a sample app

Module 3: Unit Testing

- Introduction to JUnit for Android
- Writing and running unit tests
- Testing classes, methods, and logic
- Best practices for unit testing
- Hands-on lab: Unit testing app components

Module 4: UI Testing with Espresso

- Overview of Espresso framework
- Writing UI automation test cases
- Synchronization and waiting for UI conditions
- Hands-on lab: Automate UI testing for a sample app

Module 5: Automated Testing with UI Automator & Appium

- UI Automator basics for Android apps
- Introduction to Appium for cross-platform mobile testing

- Writing automated test scripts
- Integrating automated tests into CI/CD pipelines
- Hands-on lab: Automate workflows using Appium

Module 6: Performance and Load Testing

- Profiling app performance: memory, CPU, battery
- Network and database performance testing
- Tools for monitoring and performance analysis
- Hands-on lab: Performance testing a sample app

Module 7: Security Testing

- Common security vulnerabilities in Android apps
- Testing app permissions and secure storage
- Basic penetration testing for mobile apps
- Hands-on lab: Identify security risks in a sample app

Module 8: Test Reporting and Defect Management

- Logging defects and generating test reports
- Using bug tracking tools (Jira, Bugzilla)
- Analyzing test coverage and metrics
- Integrating testing into development workflow

Module 9: Capstone Exercise

- Perform end-to-end testing of a real-world Android app
- Conduct manual, UI, performance, and security tests
- Prepare a comprehensive test report
- Present findings and recommendations