

Mobile Application Development

Course Duration: 96 Hours

Course code: MAD

1. Course Overview

This course introduces participants to the fundamentals of mobile app development across Android and iOS platforms. It covers mobile development frameworks, UI/UX design, APIs, databases, deployment, and best practices. By the end, participants will be able to design, develop, and publish fully functional mobile apps.

2. What you'll learn?

- Understand mobile platforms and architectures (Android, iOS, Cross-platform).
- Build mobile apps using native and cross-platform frameworks.
- Design intuitive UI/UX with responsive layouts.
- Work with databases, REST APIs, and cloud services.
- Implement security, authentication, and data storage.
- Test, debug, and deploy apps to Google Play Store and Apple App Store.

3. Target Audience

- Beginners interested in mobile app development
- Software developers expanding into mobile platforms
- Students and IT professionals seeking cross-platform skills
- Anyone aiming to publish mobile apps on app stores

4. Pre-Requisites

- Basic programming knowledge (Java, JavaScript, Python, or similar)
- Familiarity with Object-Oriented Programming (OOP)
- Prior knowledge of web development concepts is helpful but not mandatory

5. Course content

Module 1: Introduction to Mobile Application Development

- Evolution of mobile applications
- Android vs iOS vs Cross-platform
- Native, hybrid, and cross-platform development approaches
- Development tools overview (Android Studio, Xcode, Flutter, React Native)

Module 2: Mobile App Architecture and Fundamentals

- Application lifecycle (Android & iOS)
- MVC/MVVM/MVP patterns
- Components of a mobile application
- Mobile APIs and SDKs

Module 3: User Interface and User Experience (UI/UX)

- Introduction to mobile UI design
- Layouts, navigation patterns, and responsive design
- Material Design and Human Interface Guidelines
- Hands-on: Designing a login and dashboard screen

Module 4: Mobile Databases and Storage

- Local databases: SQLite, Realm
- NoSQL options (Firebase, MongoDB)
- Shared Preferences and secure storage
- Cloud database integration

Module 5: Networking and API Integration

- RESTful APIs and JSON
- Fetching and displaying data in apps
- Handling errors and network connectivity issues
- Hands-on: Building a weather app using an API

Module 6: Mobile Security and Authentication

- Authentication methods (Email/Password, OAuth, Social Logins)
- Data encryption and secure storage
- Permissions and privacy considerations
- Role of SSL/TLS in mobile apps

Module 7: Mobile App Testing and Debugging

- Debugging tools for Android and iOS
- Unit testing and UI testing
- Performance profiling and optimization
- Common debugging practices

Module 8: Deploying Mobile Applications

- Preparing Android apps for release (APK, App Bundle)
- Preparing iOS apps for release (Provisioning, Certificates)
- Publishing apps to Google Play Store and Apple App Store
- App store compliance and monetization strategies

Module 9: Cross-Platform Mobile Development (Overview)

- Flutter and Dart basics
- React Native fundamentals
- Pros and cons of cross-platform frameworks
- Hands-on: Simple cross-platform app demo

Module 10: Capstone Project

- End-to-end project: Build and publish a real-world mobile application
- Example: To-Do App, E-commerce App, or Chat App
- Code review, debugging, and optimization
- Final project presentation