

Android App Development

Course Duration

- **Total Duration:** 80–100 Hours
- **Theory:** 30%
- **Practical / Projects:** 70%

Prerequisites

- Basic Computer Fundamentals
- Basic Programming Knowledge (Java / Kotlin helpful)
- Understanding of OOP concepts

Module 1: Introduction to Mobile & Android Platform (6 Hours)

- Introduction to Mobile Application Development
- Android OS Architecture
- Android Versions & Features
- Android App Components Overview
- Setting up Development Environment
 - Android Studio
 - SDK & Emulator

Module 2: Java / Kotlin Fundamentals for Android (10 Hours)

- Java vs Kotlin for Android
- Basics of Java / Kotlin
- Variables & Data Types
- Control Statements
- Functions / Methods
- OOP Concepts
- Packages & Classes

Module 3: Android Project Structure (6 Hours)

- Android Studio Interface
- Project Folder Structure
- Gradle Build System
- Android Manifest File
- Resource Management (res folder)

Module 4: UI Design & Layouts (12 Hours)

- Views & ViewGroups
- Layout Types
 - LinearLayout

- RelativeLayout
- ConstraintLayout
- FrameLayout
- TextView, EditText, Button
- ImageView
- RecyclerView
- CardView
- Material Design Principles

Module 5: Activities & Intents (8 Hours)

- Activity Lifecycle
- Explicit & Implicit Intents
- Passing Data between Activities
- Fragments
- Fragment Lifecycle

Module 6: Event Handling & User Interaction (6 Hours)

- OnClick Listeners
- Touch Events
- Menus
 - Options Menu
 - Context Menu
 - Popup Menu
- Dialogs & Toasts
- Snackbars

Module 7: Data Storage & Persistence (10 Hours)

- Shared Preferences
- Internal & External Storage
- SQLite Database
- Room Persistence Library
- CRUD Operations

Module 8: Networking & API Integration (10 Hours)

- Internet Permissions
- REST API Concepts
- JSON Parsing
- HTTP Libraries
 - Retrofit
 - Volley
- Consuming Web Services
- Error Handling

Module 9: Background Tasks & Services (6 Hours)

- Services
- Broadcast Receivers
- WorkManager
- Async Tasks (Overview)
- Notifications

Module 10: Advanced Android Concepts (8 Hours)

- Firebase Integration
 - Authentication
 - Realtime Database / Firestore
- Push Notifications
- Google Maps Integration
- Location Services

Module 11: Testing, Debugging & Optimization (6 Hours)

- Debugging Tools
- Logcat
- Unit Testing (Overview)
- Performance Optimization
- App Security Basics

Module 12: App Publishing & Deployment (6 Hours)

- App Signing
- Generating APK / AAB
- Google Play Console
- App Release Process
- Versioning
- App Monetization (Overview)

Module 13: Projects & Case Studies (12 Hours)

Mini Projects:

- Calculator App
- Notes App
- Quiz Application

Major Project:

- Complete Android App with:
 - Authentication
 - Database
 - API Integration
 - Material UI
 - Play Store Ready

Learning Outcomes

After completing this course, learners will be able to:

- Design and develop Android applications
- Work with layouts, activities, and fragments
- Integrate APIs and databases
- Use Firebase services
- Publish apps on Google Play Store

ICT Kaithal 9896330447