Professional Android App Development Course Outline

Module 1: Introduction to Android Development

- Overview of Android & Its Ecosystem
- Understanding Android Architecture & Components
- Java vs. Kotlin for Android Development
- Setting Up Android Development Environment (Android Studio, Emulator)
- First Android Application (Hello World)

Module 2: Kotlin Fundamentals for Android

- Kotlin Syntax & Data Types
- Control Flow (Loops, Conditions, Functions)
- Object-Oriented Programming (OOP) in Kotlin
- Exception Handling & Null Safety
- Coroutines for Asynchronous Programming

Module 3: Android UI Design & XML Layouts

- Understanding Views, ViewGroups & UI Components
- Layouts (LinearLayout, ConstraintLayout, RelativeLayout)
- Using RecyclerView & CardView for Lists
- Customizing UI with Themes & Styles
- Working with Material Design Components

Module 4: Activities, Fragments & Navigation

- Understanding Activity Lifecycle
- Creating & Managing Fragments
- Fragment Communication & ViewModel Usage
- Navigation Component & Deep Linking

- Passing Data Between Activities & Fragments

Module 5: Handling User Input & Forms

- Using EditText, Buttons, Checkboxes, & Radio Buttons
- Form Validation & Input Handling
- Using Snackbar, Toast & Dialogs for User Feedback
- Customizing UI Interactions

Module 6: Working with Databases & Storage

- Storing Data with SharedPreferences
- SQLite Database Integration
- Room Database for Local Storage
- Using Firebase Firestore for Cloud Storage
- Working with Content Providers

Module 7: Networking & API Integration

- Making Network Requests with Retrofit & Volley
- Parsing JSON Data (Gson & Moshi)
- Consuming RESTful APIs
- Caching & Handling API Errors
- WebSockets & Real-Time Data Updates

Module 8: State Management & Dependency Injection

- ViewModel & LiveData for State Management
- Dependency Injection with Dagger & Hilt
- Using WorkManager for Background Processing
- Managing App Lifecycle with Lifecycle Aware Components

Module 9: Authentication & Security

- Implementing User Authentication with Firebase Auth
- OAuth Authentication (Google, Facebook, Twitter Login)
- Biometric Authentication (Fingerprint & Face ID)
- Secure API Calls with Retrofit Interceptors
- Preventing SQL Injection & XSS Attacks

Module 10: Background Tasks & Notifications

- Running Background Tasks with WorkManager

- Implementing Push Notifications with Firebase Cloud Messaging (FCM)
- Handling Background Services & Broadcast Receivers
- JobScheduler for Scheduled Tasks

Module 11: Camera, Media & Sensors

- Capturing Photos & Videos with Camera API
- Working with ImageView & Glide/Picasso for Image Loading
- Integrating Google Maps & Location Services
- Using Motion Sensors & Accelerometer

Module 12: Performance Optimization & Debugging

- Debugging with Android Studio Profiler
- Memory Management & Leak Detection with LeakCanary
- Optimizing UI Rendering & Performance
- Reducing App Size with ProGuard & R8

Module 13: Testing & Quality Assurance

- Unit Testing with JUnit & Mockito
- UI Testing with Espresso
- Performance Testing with Firebase Test Lab
- Handling Crashes & Logging with Crashlytics

Module 14: Deployment & Play Store Publishing

- Generating Signed APK & AAB Files
- Play Store Guidelines & App Monetization Strategies
- Using Google Play Console for App Distribution
- Handling App Updates & Versioning

Module 15: Final Project & Certification Preparation

- Building a Real-World Android Application
- Best Practices for Scalable & Maintainable Code
- Preparing for Android Developer Certification
- Career Paths in Android Development