

# **Beginner's Guide to Android App Development with XML and Jetpack Compose**

## **Module 1**

### **Basics of Kotlin Programming**

- Introduction to Kotlin
- Android Studio Setup
- Kotlin Variables and Data Types
- Control Flow (if, when, loops)
- Functions and Lambdas
- Higher-order functions and Lambdas
- Object-Oriented Programming in Kotlin (Class, Object, Inheritance, Abstract Class)
- Kotlin Collections
- Null Safety
- Coroutines basics

### **Practical Lab:**

- Set up Kotlin in Android Studio
- Write a simple Kotlin program demonstrating variables, data types, and control flow
- Create classes and objects, demonstrating inheritance and use collections.

## **Module 2**

### **Overview of Android Development**

- Introduction to Android OS
- Android Platform architecture
- Components of Android Application
- Project Structure and Components

### **Practical Lab:**

- Create a new Project and modify it to give a "Hello World" app
- Explore the project structure

## **Module 3**

### **XML Based UI development**

- Introduction to XML in Android
- Activities and Activity Lifecycle
- Commonly Used Layouts: Linear Layout, Relative Layout, Constraint Layout
- View Hierarchy and UI Components (Text Box, Image, Buttons etc)
- Alerts and Notifications

### **Practical Lab:**

- Design a simple user interface using Linear Layout and Relative Layout
- Create a more complex UI using Constraint Layout
- Add basic UI components like Buttons and Text Views to produce alerts and Notifications.

## **Module 4**

### **Advanced UI Components**

- RecyclerView and Adapters

- Card View
- Navigation Components (Bottom AppBar, Drawer widgets etc)

**Practical Lab:**

- Implement a RecyclerView with a custom adapter
- Create a Card View layout and use inside the RecyclerView
- Use Navigation components to enhance UI

## **Module 5**

### **Getting Started with Jetpack Compose**

- Introduction to Jetpack Compose
- Comparing Compose with traditional XML based UI development
- Setting up a Compose project and creating a simple Composable function
- Understanding basic Composables
- Adding interactivity with Composable functions
- Responding to User actions
- Using Layouts: Column, Row, Box

**Practical Lab:**

- Set up a new project using Jetpack Compose
- Create a simple UI using basic Compose components

## **Module 6**

### **Navigation and Theming in Compose**

- Navigation in Compose
- Passing Data to Composable
- Create Custom Composable
- Create Dynamic Lists with Lazy Column and Row
- Themes and Styles
- Material Design in Compose

**Practical Lab:**

Implement navigation between screens in a Compose app

Apply themes and styles to a Compose app to make the app more appealing

## **Module 7**

### **MVVM Pattern and State management in Compose**

- MVVM Pattern
- Managing State in Compose
- Modifiers and UI Customization

**Practical Lab:**

Manage state in a Compose application, following the MVVM pattern

Customize UI with modifiers

## **Module 8**

### **Firestore Authentication and Databases in Compose**

- Room Library for Local Data storage
- Firestore Setup
- Firestore Authentication

- Firebase Database for Cloud Data storage

**Practical Lab:**

Create a Room database and perform CRUD operations in a Compose app  
Implement user authentication using Firebase

**Module 9**

**JSON and Retrofit**

- Introduction to JSON
- Making network requests with Retrofit
- Parsing JSON responses

**Practical Lab:**

- Make a network request using Retrofit
- Parse JSON data and display it in a Compose UI
- Handle API responses and errors

**Module 10**

**Final Project**

- Project Planning and Design
- Best Practices and Optimization
- Develop a complete Android app