KOENIG SOLUTIONS · COURSE OUTLINE

Advanced Android Mobile Application Development with Kotlin

Learn to build Android applications with Kotlin, from Jetpack Compose UIs to API integration, architecture patterns and unit testing.

8 Days
64 HOURS

39
TOPICS

16
HANDS-ON ACTIVITIES

COURSE OVERVIEW

This course covers Android architecture and Kotlin basics before moving into object-oriented Kotlin and core Android components such as activities and intents. It then builds Jetpack Compose skills, from composable functions and layouts to lists, navigation and accessibility. Later modules cover REST API integration with Retrofit and coroutines, MVVM and clean architecture design patterns, structured concurrency with Flow, and unit testing with JUnit, Mockito and Espresso, culminating in a capstone project.

WHO THIS COURSE IS FOR

- **Android Developers**
- **Mobile App Developers**
- **Software Engineers**
- **Kotlin Developers**
- **UI Developers**

PREREQUISITES

- Working knowledge of Any OOPS Programming Language

LEARNING OBJECTIVES

- Explain Android OS architecture and Kotlin language fundamentals
- Apply object-oriented Kotlin concepts such as classes and interfaces
- Describe Android app components including activities and intents
- Build user interfaces with Jetpack Compose and Material Design
- Implement navigation and accessibility features in Compose apps
- Integrate REST APIs using Retrofit, Gson and coroutines
- Apply MVVM and clean architecture patterns in app design
- Develop unit tests with JUnit, Mockito and Espresso

COURSE SYLLABUS

39 Topics

DAY 1 Introduction to Android & Kotlin Basics

TOPICS

2 Hands-on Labs

Overview of Android OS and architecture · Android Studio setup and emulator usage

KOTLIN BASICS

Variables and Data Types · Conditional Statements · Loops · Functions and Lambdas

DAY 2 Object-Oriented Kotlin and Android Fundamentals

Object-Oriented Kotlin

2 Hands-on Labs

TOPICS

Classes, Objects, Inheritance · Interfaces and Abstract Classes · Extension Functions and Null Safety

Android App Components

TOPICS

Activity Lifecycle · Intents and Navigation · Toasts and Logs

DAY 3 Introduction to Jetpack Compose

TOPICS

2 Hands-on Labs

Basics of Jetpack Compose · Composable Functions · Layouts (Column, Row, Box) · Modifiers and Styling · State Management (remember, mutableStateOf)

DAY 4 Advanced Jetpack Compose & Accessibility

TOPICS

2 Hands-on Labs

LazyColumn and Lists · Navigation in Compose · Material Design in Compose

ACCESSIBILITY IN ANDROID

TalkBack · Content Descriptions · Accessibility Scanner

DAY 5 REST API Integration

TOPICS

2 Hands-on Labs

Retrofit library for API Calls · JSON Parsing with Gson or Moshi · Coroutines for network requests · Error Handling and Retry Logic

DAY 6 Design Patterns in Android

TOPICS

2 Hands-on Labs

Builder Pattern · Adapter Pattern · MVVM Architecture · Clean Architecture Principles

DAY 7 Modern Concurrency in Kotlin

TOPICS

2 Hands-on Labs

- Introduction to Kotlin Coroutines
- Coroutine Scopes (Global, ViewModel, Lifecycle)
- Flow and LiveData
- Structured Concurrency

DAY 8 Unit Testing and Final Project

TOPICS

2 Hands-on Labs

Introduction to Unit Testing with JUnit · Mockito basics · Testing ViewModels and UseCases · UI Testing with Espresso (intro only)

HANDS-ON ACTIVITIES

Practise What You Learn

MODULE	ACTIVITY
Introduction to Android & Kotlin Basics	■ Set up Android Studio ■ “Hello World” Kotlin app with a button click counter
Object-Oriented Kotlin and Android Fundamentals	■ Create a multi-activity app with data passing ■ Use logs and toasts for debugging
Introduction to Jetpack Compose	■ Create a form UI using Jetpack Compose ■ Dynamic text update based on user input
Advanced Jetpack Compose & Accessibility	■ Build a notes list app with navigation ■ Add accessibility labels and test with TalkBack
REST API Integration	■ Build a weather app using Retrofit ■ Display live weather data in UI
Design Patterns in Android	■ Implement MVVM with ViewModel and LiveData ■ Refactor previous weather app using Clean Architecture layers

MODULE	ACTIVITY
Modern Concurrency in Kotlin	■ Use Coroutine and Flow for API and UI updates ■ Parallel data loading with async/await
Unit Testing and Final Project	■ Write unit tests for ViewModel and Repository ■ **Final Capstone Project:** A functional app using Compose, MVVM, API integration, and tests

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

FLEXIBLE DELIVERY

Learn the Way That Suits You

Classroom Training | Live Online Classes (ILO) | Fly-Me-A-Trainer (FMAT) | Flexi (Self-Paced) | 1-on-1 Training

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Talk to a learning advisor about schedules, group training and customised delivery.

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