KOENIG
step forward

KOENIG SOLUTIONS · COURSE OUTLINE

Jetpack Compose: MVVM, Retrofit & Room Database

Learn to build Android apps with Jetpack Compose, applying MVVM, Retrofit, and Room for UI, networking, and data persistence.

8	45	12
MODULES	TOPICS	HANDS-ON ACTIVITIES

COURSE OVERVIEW

This course covers Jetpack Compose fundamentals, including basic composables and layouts for responsive UIs across screen sizes. It then addresses state management, theming, navigation, and MVVM architecture, followed by handling user input and building animations. Later modules cover networking with Retrofit and Coroutines, data persistence with Room, advanced state handling, localization, and unit and UI testing.

WHO THIS COURSE IS FOR

Android Developers | **Mobile App Developers** | **UI Developers** | **Software Engineers**

LEARNING OBJECTIVES

- Build layouts using basic composables and Modifiers
- Apply state management with remember and mutableStateOf
- Configure Material Design theming with custom typography and colors
- Implement navigation between composables with data passing
- Apply MVVM architecture using ViewModel and LiveData
- Develop animations using AnimatedVisibility and transitions
- Implement API requests with Retrofit and Coroutines
- Configure Room database for data persistence and CRUD operations

COURSE SYLLABUS

8 Modules, 45 Topics

01

2 Activities

Jetpack Compose Basics and Layouts

INTRODUCTION TO JETPACK COMPOSE

- What is Jetpack Compose?
- Key differences from XML layouts
- How Compose simplifies UI development

BASIC COMPOSABLES

- Text, Button, Image, Column, Row, Box
- Modifiers for styling and layout

LAYOUTS IN JETPACK COMPOSE

- ConstraintLayout, LazyColumn, and LazyRow
- Building responsive UIs with Modifiers
- Handling multiple screen sizes and density
- Adjusting for different screen sizes and densities with Modifier, BoxWithConstraints

02

Activity

State Management, Theming, and Navigation

STATE MANAGEMENT IN JETPACK COMPOSE

- State in Compose
- remember, mutableStateOf, and state hoisting

THEMING IN JETPACK COMPOSE

- Material Design theming in Compose
- **Custom themes:** typography, color palettes, and dark mode

NAVIGATION IN JETPACK COMPOSE

- Setting up the navigation component
- Navigating between screens
- Passing data between composables

MVVM ARCHITECTURE

- Introduction to Model-View-ViewModel (MVVM) in Android
- Using ViewModel in Jetpack Compose
- State handling and LiveData

03

Activity

Handling User Input

HANDLING USER INPUT

TextField, Buttons, Switches, and Sliders · Form validation and user input management

04

3 Activities

Animations

ANIMATIONS IN JETPACK COMPOSE

- Simple and complex animations
- Using AnimatedVisibility, animateFloatAsState, and transitions
- Advanced Animations
- Building custom animations using updateTransition, animateContentSize, etc.
- Using keyframes and animation specs for fine-grained control

05

Activity

Networking

NETWORKING WITH RETROFIT

- Performing API requests with Retrofit
- Displaying remote data in Compose
- Handling asynchronous data with Coroutines and Flow

06

Activity

Data Persistence and Advanced State Handling

DATA PERSISTENCE WITH ROOM

Setting up Room database in Jetpack Compose · Performing CRUD operations · Integrating Room with ViewModel and LiveData

ADVANCED STATE HANDLING

Combining State and ViewModel · Working with Coroutines and Flow · Managing complex states across screens

07

2 Activities

Localization in Android

INTRODUCTION TO LOCALIZATION

- Overview of localization and its importance
- **Android's localization mechanism:** Resources and the res/values directory
- Defining language-specific resources (strings, layouts, etc.)

IMPLEMENTING LOCALIZATION IN ANDROID

- Creating string resources for different languages
- Using values-<locale> folders for translations
- Loading localized content based on device settings

08

Activity

Unit and UI Testing

UNIT TESTING IN JETPACK COMPOSE

- Introduction to Unit Testing in Android
- Writing tests for ViewModel and business logic
- Testing with JUnit and Mockito

UI TESTING IN JETPACK COMPOSE

- Testing UI components, navigation, and interactions

HANDS-ON ACTIVITIES

Practise What You Learn

#	MODULE	ACTIVITY
01	**Jetpack Compose Basics and Layouts**	LAB 1 ■ Build a simple app using basic composables and MVVM for managing state, such as a counter app with ViewModel ■ Implement responsive layouts for different screen sizes
02	**State Management, Theming, and Navigation**	**Lab 2:** Build a multi-screen app using Jetpack Compose navigation, incorporating MVVM and dynamic themes
03	**Handling User Input**	**Lab 3:** Implement user input forms with validation and basic animations to enhance user experience
04	**Animations**	LAB 4 ■ Create a sample app that utilizes various animations: ■ Implement a loading spinner using AnimatedVisibility ■ Use animateFloatAsState to create a smooth transition effect for a button that changes size on press
05	**Networking**	**Lab 5:** Build an app that retrieves data from an API, displays it using Compose UI, and integrates animations
06	**Data Persistence and Advanced State Handling**	**Lab 6:** Build an app that stores user data in a Room database and Flow to handle complex state
07	**Localization in Android**	LAB 7 ■ Create a basic app with string resources in two languages (e.g., English and Spanish) ■ Change device language and observe the app's behavior
08	**Unit and UI Testing**	**Lab 8:** Implement unit tests for ViewModel logic and UI tests for your Compose-based app, testing user interactions and navigation

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

Ready to Get Started?

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

Visit koenig-solutions.com | info@koenig-solutions.com