

KOENIG SOLUTIONS · COURSE OUTLINE

Cross-Platform Mobile Application Development - Focused

Learn to build cross-platform mobile apps with Dart, Flutter, React and React Native, from UI and state management to Firebase integration.

12 Days

DURATION

13

MODULES

54

TOPICS

39

HANDS-ON LABS

COURSE OVERVIEW

This course covers Dart programming fundamentals before moving into Flutter, including widgets, layouts, state management, forms, API integration, navigation and local data storage, culminating in a complete app project. It then introduces React basics and React Native, covering core components, styling, multi-screen navigation, API data fetching and state management with Context API or Redux. The course also addresses Firebase Authentication and Firestore database integration for sign-up, login and CRUD operations, finishing with a second end-to-end project combining these skills into a functional mobile app.

WHO THIS COURSE IS FOR

Mobile App Developers

Front-End Developers

React Developers

Software Developers

Flutter Developers

PREREQUISITES

- Knowledge of OOPS-based programming language

LEARNING OBJECTIVES

Training Outcome

- Understand React & React Native, Dart and Flutter
- Be able to build UI, handle state, and integrate APIs
- Implement Firebase Authentication & Firestore Database
- Develop a fully functional mobile app
- Gain experience with real-world mobile app development

13 Modules, 54 Topics

01

3 Labs

Introduction to Dart Programming

THEORY

- Overview of Dart and Its Role in Flutter
- **Dart Basics:** Variables, Data Types, Operators
- **Control Flow:** Loops & Conditional Statements
- Functions & Object-Oriented Programming (Classes, Objects, Inheritance)

02

3 Labs

Getting Started with Flutter

THEORY

- Overview of Flutter & Its Architecture
- Setting Up Flutter Development Environment
- Flutter Project Structure & File System
- **Introduction to Widgets:** Stateless vs. Stateful Widgets

03

3 Labs

UI Development & Layouts in Flutter

THEORY

Understanding the Widget Tree & Composition · **Basic UI Components:** Text, Images, Buttons · **Layout Widgets:** Column, Row, Stack, ListView · Styling, Theming, and Responsive UI Design

04

3 Labs

State Management & Forms

THEORY

Understanding State in Flutter · Managing State using `setState()` · Handling Forms & User Input · Form Validation & Error Handling

05**3 Labs**

Networking, API Integration & Navigation

THEORY

- Working with APIs & HTTP Requests (http package)
- Fetching & Displaying JSON Data
- Navigation in Flutter (Navigator 1.0 & 2.0)
- Persistent Data Storage (SharedPreferences & Local Database)

06**3 Labs**

End Project - Building a Complete App

PROJECT OVERVIEW

- Build a Mini E-commerce App, To-Do List App, or Weather App
- Implement User Authentication (Optional)
- Fetch & Display API Data
- Use State Management & Navigation
- Store User Preferences Locally

07**3 Labs**

Introduction to React Basics

THEORY

- What is React? Understanding Component-Based Architecture
- JSX Syntax & Rendering Elements
- Props & State in React
- Handling Events & Basic Hooks (useState, useEffect)

08**3 Labs**

Getting Started with React Native

THEORY

- Introduction to React Native & Its Architecture
- Setting Up React Native Development Environment (Expo & React Native CLI)
- **Core Components:** View, Text, Image, Button, ScrollView
- Styling in React Native (Flexbox, Stylesheets)

09**3 Labs**

Navigation & Multi-Screen Apps

THEORY

- Understanding Navigation in Mobile Apps
- Setting Up React Navigation (react-navigation package)
- Stack Navigation vs. Tab Navigation
- Passing Data Between Screens

10**3 Labs**

API Integration & Data Fetching

THEORY

Fetching Data from APIs (fetch, axios) · Handling API Responses & Errors · Displaying Dynamic Data in Components · Async/Await & Performance Considerations

11**3 Labs**

State Management, Authentication & Data Storage

THEORY

- Introduction to State Management (Context API, Redux)
- Managing Global State vs. Local State
- Persistent Storage using AsyncStorage
- Debugging & Performance Optimization

12**3 Labs**

Firebase Authentication & Database Integration

THEORY

Introduction to Firebase · Setting Up Firebase Project & Configuring SDK · User Authentication (Sign-up, Login, Logout) · Firestore Database & CRUD Operations

End Project - Building a Complete App

PROJECT OVERVIEW

- Build a Mini E-commerce App, To-Do List, or News App
- Implement User Authentication (Optional)
- Fetch & Display API Data
- Use State Management & Navigation
- Store User Preferences Locally

HANDS-ON LABS

Practise What You Learn

#	MODULE	ACTIVITY
01	Introduction to Dart Programming	■ Install Dart SDK & Run Basic Dart Programs ■ Create Simple Functions & Work with Lists, Maps ■ Implement a Small Console-Based Calculator
02	Getting Started with Flutter	■ Install Flutter SDK & Setup Android/iOS Emulator ■ Create a “Hello World” Flutter App ■ Explore and Modify the Flutter Project Structure
03	UI Development & Layouts in Flutter	■ Build a Simple Login Screen UI ■ Create an Interactive Profile Page with Images & Buttons ■ Implement Flexbox-like Layouts using Row & Column
04	State Management & Forms	■ Create a Registration Form with Input Fields ■ Implement Form Validation (e.g., Email, Password) ■ Build a To-Do List App Using Stateful Widgets
05	Networking, API Integration & Navigation	■ Fetch & Display Data from a Public API (e.g., Weather API) ■ Implement Multi-Screen Navigation ■ Store User Preferences Using SharedPreferences
06	End Project - Building a Complete App	■ Develop the project step by step ■ Debugging & Optimization ■ Final Testing & Deployment Overview
07	Introduction to React Basics	■ Install Node.js, VS Code, and Create a React Project ■ Build a Simple Counter App using useState ■ Implement a Basic To-Do List with State Management

#	MODULE	ACTIVITY
08	Getting Started with React Native	■ Install Expo CLI & Create a React Native App ■ Build a Simple Profile Screen with Text & Images ■ Implement Flexbox Layouts for Responsive UI
09	Navigation & Multi-Screen Apps	■ Implement Stack Navigation with Multiple Screens ■ Create a Bottom Tab Navigation for an App ■ Pass User Data Between Screens
10	API Integration & Data Fetching	■ Fetch and Display Data from a Public API (e.g., Weather API) ■ Implement a Search Feature ■ Handle Loading & Error States in API Calls
11	State Management, Authentication & Data Storage	■ Implement a Global State using Context API ■ Store User Preferences Locally (AsyncStorage) ■ Optimize & Debug State Updates
12	Firebase Authentication & Database Integration	■ Implement Firebase Email/Password Authentication ■ Create a User Profile Screen After Login ■ Store & Retrieve Data in Firestore Database
13	End Project - Building a Complete App	■ Develop the project step by step ■ Debugging & Optimization ■ Final Testing & Deployment Overview

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.

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