

Unified Mobile Application Developer Program (Native + Cross-Platform)

Duration: 30 days

Prerequisite: Knowledge of OOPS and Mobile Development

Day 1 — Kotlin Fundamentals

Module 1: Kotlin Basics

- Kotlin history, advantages
- How Kotlin programs work
- IntelliJ IDEA installation & setup
- Creating and running Kotlin programs
- Kotlin variables, data types
- Comments, input handling

Lab: Write basic Kotlin programs (variables, input, condition checks)

Day 2 — Control Flow & Functions

Module 2: Control Flow

- If, if-else, logical operators
- When expression
- Loops: for, while, do-while
- Jump expressions: break, continue, return

Module 3: Functions

- Function structure, parameters
- Scope, returns

Lab: Build menu-driven console app using loops & functions

Day 3 — OOP in Kotlin

Module 4: OOP Concepts

- Classes, objects
- Constructors
- Inheritance
- Abstract classes, interfaces
- Generics
- Collections: HashMap, ArrayList

Lab: Build an object-oriented billing system

Day 4 — Android Framework & First App

Module 5: Android Platform Architecture

- Android libraries
- Android components
- Android Studio setup
- Creating Android project
- Running app on emulator / physical device

Lab: Create first Android app + Simple Calculator App

Day 5 — UI Components & Layouts

Module 6: Creating User Interfaces

- Views: TextBox, Image, Checkbox, RadioButton
- Layouts: Constraint, Linear, Relative, Frame, TableRow
- Styles & Themes
- App Manifest & App Icons

Lab: Build Pizza Order UI + basic interaction

Day 6 — Activities, Intents & Notifications

Module 7: Activity Lifecycle

- Activity lifecycle
- Navigating between activities
- Passing data via Intent
- Alert dialogs
- Notifications & Notification Channels

Lab: Mail Schedule Pickup App

Day 7 — Widgets, RecyclerView & Navigation

Module 8: Widgets

- ProgressBar, SeekBar
- Date & Time Picker
- WebView, RatingBar, VideoView

Module 9: Navigation Components

- Menus
- Bottom App Bar
- RecyclerView
- SearchView
- TabLayout, ViewPager
- Drawer

Lab: Navigation Drawer App

Day 8 — Firebase & Google Maps

Module 10: Firebase

- Firebase Authentication
- Firebase Realtime DB / Firestore
- User login/logout

Module 11: Google Maps

- GPS
- Adding Google Maps
- Map markers
- Capturing user location

Lab: Firebase Login App + Google Map App

Day 9 — Jetpack Compose Basics

Module 1: Compose Basics

- What is Compose?
- Text, Button, Image, Column, Row, Box
- Modifiers
- Layouts: LazyColumn, LazyRow
- Responsive UI with BoxWithConstraints

Lab: Build counter app using MVVM + responsive layout

Day 10 — State, Themes & Navigation

Module 2: Compose Architecture

- State: remember, mutableStateOf
- Material theming
- Dark mode
- Navigation in Compose
- Passing data between screens
- MVVM with ViewModel

Lab: Multi-screen themed app with navigation

Day 11 — Handling Inputs

Module 3: Input Handling

- TextField, Buttons, Switch, Slider

- Form validation
- User input management

Lab: Build multi-field form with validation & animations

Day 12 — Animations

Module 4: Animation APIs

- AnimatedVisibility
- animateFloatAsState
- Transitions
- Advanced animations (keyframes, specs)

Lab: Custom animated UI components

Day 13 — Networking, Room & Testing

Module 5: Networking

- Retrofit API calls
- Coroutines + Flow

Module 6: Room Persistence

- CRUD operations
- Integrating Room with ViewModel

Module 8: Testing

- Unit testing ViewModel
- UI testing navigation & interactions

Lab: API + Room powered mini app

Day 14 — Dart & OOP

Lesson 1 & 2: Dart Basics

- Dart syntax, variables, data types
- Conditionals, loops
- main()
- Collections

Lesson 3: Dart OOP

- Classes, objects
- Constructors
- Inheritance

Lab: Pizza Order app in Dart

Day 15 — Flutter Essentials

Lesson 4: Flutter Setup

- Flutter SDK
- Project creation
- Emulators & devices
- Flutter Widgets overview
- MaterialApp

Lab: Simple Flutter App

Day 16 — Widgets & Layouts

Lesson 5: Flutter Widget Fundamentals

- Scaffold, Image, Container
- Columns, Rows
- Card Widget
- Custom Fonts
- Stateful vs Stateless

Lab: Restaurant Menu App

Day 17 — Navigation & Routing

Lesson 6: Routing

- Named routes
- Passing data
- WebView widget
- Button widgets

Lab: Pizza Store Navigation App

Day 18 — Material Components

Lesson 7 & 8: Material Design Widgets

- BottomNavBar
- TabBar
- ListTile, ListView
- DataTable
- TextField, Checkbox, Radio
- Date & Time Pickers
- Dialogs, Alerts, Bottom Sheets
- Snackbars

Lab: Hotel Reservation App

Day 19 — Firebase & Maps

Lesson 9: Firebase

- Authentication
- Realtime DB / Firestore

Lesson 10: Google Maps

- Adding Google Maps
- API keys
- Marker placement
- Capturing location

Lab: Location-aware Flutter App

Day 20 — React Basics

Module 1: Intro to React

- What is React?
- Environment setup
- First React app
- Architecture

Module 2: ES6 Refresher

- let, var, const
- Arrow functions
- Classes & inheritance
- Spread operator
- Exports

Lab: Build a simple React component-based app

Day 21 — Components & State

Module 3: Components

- Dynamic rendering
- Lists
- Conditional rendering
- Events
- State updates

Lab: Build multi-component form

Day 22 — Advanced Component Patterns

Module 4: Composing Components

- Props vs state
- Lifting state
- Lifecycle hooks

Lab: Build a reusable component library

Day 23 — Routing & Forms

Module 6: Routing

- Adding routes
- Parameters
- Nested routes

Module 7: Forms

- Controlled inputs
- Validation
- JOI validation

Lab: Form + Routing mini project

Day 24 — Backend Integration

Module 8: Calling Backend Services

- GET, POST, PUT, DELETE
- Handling errors
- HTTP services
- Toast notifications

Lab: API-integrated React CRUD App

Day 25 — React Native Basics

React Native Module 1 & 2

- Environment setup
- Building RN app
- State & props
- Styling
- Flexbox
- ListView, ScrollView, Images
- AsyncStorage
- Geolocation

Lab: React Native Mobile App

Day 26 — Swift Fundamentals

Module 1 & 2

- Xcode intro
- Swift basics
- Variables, constants
- Control flow
- Functions
- Structs & Classes
- Enums, tuples
- Generics
- Protocols

Lab: Swift console programs + basic iOS project

Day 27 — Swift Concurrency & Functional Programming

- Async/await
- Tasks & task groups
- Map, Filter, Reduce

Lab: Build API helper with async/await

Day 28 — SwiftUI Basics

Module 3

- What is SwiftUI
- Environment, State, Data Flow
- ContentView, Scenes
- Preview canvas

Lab: Build multi-screen SwiftUI basic app

Day 29 — UI Building in SwiftUI

Module 4

- Text, Image, Button
- Modifiers & styling
- Lists
- NavigationView & NavigationLink
- Stacks (HStack, VStack, ZStack)
- TextFields, Pickers, Toggles

Lab: Build form-driven SwiftUI app

Day 30 — Networking & Instruments

Module 5: Remote Data

- URLSession
- JSON parsing
- Displaying remote data

Module 6: Instruments

- Profiling
- Memory leaks
- Performance optimization

Lab: Build API-integrated SwiftUI app + performance test