Pro Android Development with Kotlin: From Fundamentals to Deployment

Duration: 80 Hours (8 Days)

Overview

Unlock the potential of Pro Android Development with Kotlin through our comprehensive course, "From Fundamentals to Deployment." Designed for aspiring Android developers, this program covers everything from the basics of Kotlin—including syntax, setup, and first programs—to advanced topics like Firebase integration, UI design, and Google Maps. Key modules include Object-Oriented Programming (OOP), Android Framework, User Interfaces, Firebase Authentication, and Testing Techniques. Learn practical skills such as Debugging, Securing apps, and Publishing on Google Play Store. Elevate your Android development expertise with hands-on, real-world applications in a supportive, engaging environment.

Audience Profile

1. A brief introduction about the course and its relevant target audience.

- The "Pro Android Development with Kotlin: From Fundamentals to Deployment" course is designed for developers looking to enhance their skills in Kotlin for Android app development, from basics to advanced deployment techniques.

2. Job roles and audience for the course in a bullet point format.

- Junior to Senior Android Developers
- Mobile App Developers
- Kotlin Developers
- Software Engineers specializing in Mobile Applications
- IT Students and Recent Graduates in Computer Science
- Existing Android Developers looking to upskill
- Technical Lead and Team Leads overseeing mobile app projects
- Freelance Mobile Developers
- Full-Stack Developers transitioning to mobile app development
- UI/UX Designers interested in implementing their designs
- Product Managers with a technical background in mobile technology
- QA Engineers focusing on mobile application testing
- Hobbyists and Enthusiasts in Mobile App Development

Course Syllabus

Lesson 1: Introduction to Kotlin

- Overview of Kotlin and its Role in Android Development
- Basic Syntax and Structure of Kotlin Programs
- Setting Up the Development Environment
- Writing and Running Your First Kotlin Program

Lesson 2: Control Flow Statements and Functions

- Overview of Control Flow in Kotlin
- Basic Control Structures (If, When, Loops)
- Introduction to Functions in Kotlin
- Writing and Using Functions in Android Apps

Lesson 3: Object-Oriented Programming (OOP) in Kotlin

- Key Concepts of OOP in Kotlin
- Working with Classes and Objects
- Inheritance, Abstract Classes, and Interfaces

Lesson 4: Android Framework and Android Studio

- Android Platform Architecture and Components
- Overview of Android Studio IDE
- Setting Up an Android Project
- Running Android Apps on Emulators and Physical Devices
- Lesson 5: Creating User Interfaces in Android
- Introduction to Android Views and Layouts
- Designing UIs with XML
- Configuring Layouts Programmatically with Kotlin
- Working with Basic UI Components (Text, Images, Buttons)
- Lesson 6: Advanced UI Components and Layouts
- Overview of Advanced Layouts
- Constraint Layout
- Linear Layout
- Relative Layout
- Working with Styles and Themes in Android
- Creating Menus and Customizing App Icons

Lesson 7: Handling Navigation and User Interaction

- Activity Lifecycle Management
- Navigating Between Activities with Intents
- Handling User Inputs with Dialogs and Notifications
- Snack bar, Alert Dialog, and Notifications Overview

Lesson 8: Working with Android Widgets

- Introduction to Android Widgets
- Progress Bar, Seek Bar
- Date and Time Picker Dialogs
- Calendar View and Web View
- Customizing Widgets for Enhanced User Experience

Lesson 9: Implementing Android Navigation Components

- Overview of Android Navigation Components
- Implementing Bottom Navigation and Drawer Menus
- Working with Recycler View, Search View, and Tab Layout
- Handling Data in Spinners and AutoCompleteTextView

Lesson 10: Firebase Authentication and Database Integration

- Introduction to Firebase for Android
- Setting Up Firebase Authentication (Sign Up and Login)
- Working with Firebase Realtime Database and Cloud Fire store
- Best Practices for Using Firebase in Production Apps

Lesson 11: Location-Based Services and Google Maps Integration

- Understanding GPS and Location Services in Android
- Integrating Google Maps in Android Apps
- Setting Up Google API Keys
- Displaying Maps and Markers
- Implementing Location Tracking and Geolocation

Lesson 12: Testing and Publishing Android Apps

- Overview of App Testing Strategies
- Usability Testing and Feedback Collection
- Using Firebase Test Lab for Automated Testing
- Preparing and Publishing Your App on Google Play Store
- Key Considerations for App Release
- Managing App Versions and Updates

Lesson 13: Migration, App Versioning and Production level scenarios

- Migrating an app from a Low code solution (Like FlutterFlow) to native Android
- Android implementation of App Versioning and Update Strategies such as:
- Incremental updates,
- Major updates,
- Phased Rollouts
- Best practices for Versioning and how to maintain backward compatibility

Lesson 14: Design Patterns in Android

- Introduction to Common Design Patterns
- Implementing MVVM and MVP Patterns

Lesson 15: Testing Techniques- Unit testing

- Differences between unit, integration, and UI testing
- Android Testing Overview
- The role of unit testing in Android development
- Testing frameworks (Junit, Mockito)
- JUnit Framework Basics
- Introduction to Junit
- JUnit test lifecycle: @Before, @Test, @After, etc.
- Writing and running simple unit test cases using Junit
- Configuring dependencies for unit testing (Junit)
- Common Assertions in JUnit
- Introduction to assertions (assertEquals, assertTrue, assertFalse, etc.)
- Handling exceptions in tests using assertThrows

- Testing Android Components
- Writing tests for ViewModels and Repository classes
- Introduction to Appium
- What is Appium?
- Differences between Unit Testing and UI Testing
- Appium architecture and how it interacts with Android apps
- Setting Up Appium for Android Testing
- Installing and configuring Appium
- Installing Appium Desktop and Appium Inspector
- Connecting to an Android emulator
- Basic Concepts in Appium
- Understanding Desired Capabilities
- Locators: XPath, ID, class name, and others
- Creating Your First Appium Test
- Writing Appium tests in Kotlin
- Navigating an Android app using Appium commands
- Locating elements using XPath, IDs, and accessibility IDs
- Interacting with UI elements: clicks, input text, swiping
- Integrating Unit Testing with Appium
- Combining Unit Tests and UI Tests
- Understanding the role of Appium in end-to-end testing
- Best practices for separating unit and UI tests
- Running Appium Tests with Kotlin
- Setting up Appium tests alongside unit tests
- Using TestRunner in Android Studio

Lesson 16: Crash Handling and Debugging

- Strategies for Managing App Crashes
- Tools and Techniques for Debugging and Crash handling in Production

Lesson 17: Security in Android Apps

- Protecting Sensitive Data
- Local Data Security and Permissions Management

Lesson 18: APK Security

- Understanding the Threat Landscape
- Code Obfuscation Techniques
- Anti-Debugging Techniques
- Introduction to ProGuard tool, its basic configuration, and how it works to shrink, optimize, and obfuscate code.