Java Development Course with Android and Kotlin Focus (24 Weeks)

Phase 1: Comprehensive Training (4 Months / 16 Weeks)

Week 1: Introduction to Java Programming

- Core Java Concepts:
  - OOP principles: Encapsulation, Inheritance, Polymorphism
  - Data types, variables, operators
  - Control flow (if-else, loops)
  - Arrays and Strings
- Setting up the Development Environment:
  - Installing JDK and IDE (Eclipse or IntelliJ IDEA)
  - Hands-on: Write and run your first Java program

Week 2: Object-Oriented Programming in Java

- Classes and Objects:
  - Creating classes, constructors, methods, and fields
- Inheritance:
  - Extending classes, overriding methods
  - Superclass and subclass relationships
- Polymorphism:

- ○ Method overloading and overriding
- ○ Abstract classes and interfaces
- Hands-on: Create a console-based library management system

Week 3: Exception Handling and File I/O

- Exception Handling:
  - ○ try-catch-finally blocks
  - ○ Throwing and catching exceptions
- File I/O:
  - ○ Reading and writing files
  - ○ File streams and buffered I/O
- Hands-on: Build a log file manager application

Week 4: Collections Framework

- Collections:
  - ○ ArrayList, LinkedList, HashSet, HashMap, TreeMap
  - ○ Iterating over collections
- Generics:
  - ○ Type safety and flexibility
- Hands-on: Implement a contact management system using collections

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Week 5: Introduction to Android Development

- Android Basics:
    - Android architecture (Activities, Fragments, Services, Broadcast Receivers)
    - AndroidManifest.xml and app structure
- UI Development:
    - XML layouts, Views, and ViewGroups
    - Working with ConstraintLayout
- Hands-on: Build a basic calculator app

Week 6: User Input and Event Handling in Android

- Handling button clicks, text inputs, and other user events
- Creating dynamic UI elements in Android
- Hands-on: Create a registration form with validations

Week 7: Advanced Android UI Development

- Custom Views and Dialogs
- Animations and transitions
- Accessibility in UI design
- Hands-on: Build a to-do list app with animated transitions

Week 8: Introduction to Kotlin Programming

- Kotlin Basics:
  - Null safety, data classes, and smart casts
  - Functions, lambdas, and higher-order functions
- Using Kotlin with Android Studio
- Hands-on: Convert a Java-based Android app to Kotlin

Week 9: Asynchronous Programming with Kotlin Coroutines

- Introduction to Coroutines
- Asynchronous programming and lifecycle-aware components
- Hands-on: Build an app to fetch data from a public API using coroutines

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Week 10: Advanced Android Development

- Fragments:
  - Fragment lifecycle, transactions, back stack
  - Fragment-to-Fragment communication
- Data Persistence:
  - Shared Preferences, SQLite databases, and Room
- Hands-on: Build a notes-taking app with data persistence

Week 11: Networking in Android

- Making network requests using Retrofit

- Parsing JSON and XML data

- Caching responses for offline use

- Hands-on: Build a weather app using a public weather API

Week 12: Testing in Android Development

- Unit Testing:
    - Writing tests with JUnit and Mockito
- UI Testing:
    - Using Espresso for testing Android apps
- Hands-on: Test an existing Android app for performance and bugs

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Week 13: Introduction to Android Jetpack

- Navigation components, ViewModel, and LiveData

- WorkManager for background tasks

- Paging for large data sets

- Hands-on: Build an e-commerce app using Jetpack components

Week 14: Security and Performance Optimization

- Security in Android:
    - Protecting app data (encryption, securing API keys)

- Performance Optimization:
    - Reducing memory usage and battery consumption
- Hands-on: Optimize an existing app for speed and performance

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Week 15: Preparing Apps for Deployment

- Preparing for Google Play Store:
    - Generating signed APKs
    - Setting up a Google Play Developer account
- Deploying apps for beta testing and release
- Hands-on: Prepare and deploy a sample app to the Play Store

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Week 16: Capstone Project

- End-to-end Android app development project:
    - Using Kotlin and Android Jetpack
    - Secure app with optimized performance
    - Integrate APIs and persistent storage
- Presentation and code review

Phase 2: Job Training and Real-World Projects (2 Months / 8 Weeks)

Week 17-18: Job Readiness and Interview Preparation

- Resume and portfolio building with completed projects
- Mock interviews focusing on Java, Android, and Kotlin
- Debugging and troubleshooting real-world applications

Week 19-22: Real-World Client Projects

- Collaborate on live projects, focusing on:
  - Building Android apps with Kotlin
  - Using APIs, integrating third-party services, and deploying apps
- Weekly mentor feedback and technical guidance

Week 23-24: Final Assessment and Job Placement Support

- Final review of projects, portfolio, and skills
- Advanced interview prep (DSA, system design for Android)
- Networking opportunities with hiring partners and recruiters