

AGI INNOVATIONS MAKES360 PRIVATE LIMITED

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6-Month Android Development Training Syllabus (Kotlin + Jetpack Compose + Firebase)

Duration: 24 Weeks (6 Months)

Mode: Practical + Hands-on Projects

MONTH 1 – Kotlin Programming + Android Studio Basics (Weeks 1–4)

Week 1 - Kotlin Fundamentals

- Intro to Android ecosystem & Kotlin
- Kotlin basics: val vs var, data types
- Input/output, operators
- Control statements: if, when, loops
- Null safety, safe-call, elvis operator
- Exception handling

Assignment:

Build a console-based Calculator in Kotlin.

Week 2 - Kotlin Deep Dive

Functions (default parameters, named args)

- Lambda expressions
- Collections (List, Set, Map)
- OOP with Kotlin: classes, objects, inheritance
- Data classes, sealed classes, enums

Assignment:

Build a mini Student Data Management program using Kotlin OOP.

Week 3 – Android Studio + Compose Basics

- Project structure
- Understanding Compose architecture
- Composable functions
- State & State Hoisting
- Text, Button, Image, Column/Row, LazyColumn

Mini Project:

Build a Simple UI App (Profile Screen + Settings Screen) using Compose.

Week 4 – Navigation & Architecture Basics

- Navigation Compose
- Scaffold, TopBar, FAB, Bottom Navigation
- MVVM basics
- ViewModel, MutableState, LiveData vs StateFlow

Mini Project:

Create a 3-screen app with navigation (Home \rightarrow Details \rightarrow Profile).

MONTH 2 – Jetpack Compose Advanced + Local Data Storage (Weeks 5–8)

Week 5 – Compose Layouts & UI Components

- Advanced layouts (Box, ConstraintLayout in Compose)
- Lists, grids, item clicks
- Dialogs, snackbars, toasts in Compose
- Material 3 Design

Assignment:

Design UI screens for a Travel App using Compose.

Week 6 - Forms & Validation

- TextFields, form states
- Validation rules
- Recomposition, remember, derivedStateOf

Mini Project:

Create a login/registration UI with validation.

Week 7 – Data Storage

- DataStore (Preferences + Proto)
- Room Database
- DAO, Entities, Repository pattern
- CRUD operations with Room + Compose

Project:

Notes App with Room (Add, Update, Delete, Search Notes).

Week 8 - Kotlin Coroutines + Flows

- Suspend functions
- Coroutine scopes in Android
- StateFlow, SharedFlow
- Flow + Room

Assignment:

Integrate coroutines in Notes app (async operations).

MONTH 3 – Networking + Clean Architecture (Weeks 9–12)

Week 9 - APIs & Retrofit

- JSON basics
- Retrofit + OkHttp
- GET, POST, PUT, DELETE
- · Sealed classes for UI state

Mini Project:

Weather App using OpenWeather API.

Week 10 - Clean Architecture

Domain layer

- Use cases
- Repository abstraction
- DTOs, Mappers

Assignment:

Rebuild Weather App using clean architecture.

Week 11 - Pagination + Offline Caching

- Paging 3
- Retrofit + Room + Paging
- Error handling

Mini Project:

Image Gallery App with pagination from API.

Week 12 – Dependency Injection

- Koin OR Hilt (recommended: Hilt)
- Modules, ViewModel Injection

Assignment:

Integrate DI in Notes app or Weather app.

→ MONTH 4 – Firebase Complete (Weeks 13–16)

Week 13 - Firebase Authentication

Email-password auth

- OTP/Phone auth
- Google sign-in

Mini Project:

Firebase Login + Profile App.

Week 14 - Firestore Database

- Collections & documents
- Realtime updates
- Firestore + Compose + Flow

Project:

Chat App (real-time messaging, user list).

Week 15 - Firebase Storage

- Upload/download images
- Caching images

Mini Project:

Image Upload App (Profile picture upload + Storage link).

Week 16 - Firebase Cloud Messaging (Push Notifications)

- FCM setup
- Topic-based notifications
- Foreground service notifications

Assignment:

Send notifications to Chat App.

MONTH 5 – Advanced Android (Weeks 17–20)

Week 17 - Sensors & Permissions

- Runtime permissions
- Camera integration
- Location API

Mini Project:

Location Tracker App (Live location updates).

Week 18 – WorkManager + Background Tasks

- Periodic tasks
- Constraints

Assignment:

Background sync with WorkManager.

Week 19 - Jetpack Compose Animations

- AnimateDp
- Crossfade
- Transitions
- Lottie animations

Mini Project:

Animated Onboarding App.

Week 20 – App Optimization

- App startup time
- Memory leaks
- App signing & release

Assignment:

Generate signed APK for the Notes or Weather App.

MONTH 6 – Capstone Projects + Deployment (Weeks 21–24)

Week 21–22 – Major Project Build

Choose any real-world project:

Project Options:

- ✓ E-commerce App (Add to cart, Firebase backend)
- ✓ Chat Application (Firestore + FCM)
- ✓ Food Delivery App (Live location + tracking)
- ✓ Expense Manager (Room + charts + categories)
- ✓ Social Media App (Posts, likes, comments, storage)
- ✓ Learning App (Courses, videos, quizzes)

You will teach:

- Complete planning
- UI/UX in Compose
- MVVM + Clean Architecture
- Room + Retrofit + Firebase

Week 23 - Testing + Debugging

- Unit testing
- UI testing
- Crashlytics

Assignment:

Write test cases for a few ViewModels.

Week 24 – Play Store Deployment

- App Bundle
- Screenshots
- Content rating
- Publish on Google Play

Final Task:

Upload the final project to the Play Store.

Deliverables to Students

- Recognized certificate in Android Development
- Fully functional portfolio with 6-8 projects
- 1 Major Project + 5 Mini Projects
- GitHub profile
- Resume + LinkedIn optimization
- Play Store published app



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