

Suggested Courses for Firefly Integration

Course 1 – Introduction to Android Development with Android Studio and Java

Length: 5 days

Purpose: Allow intermediate programmers to understand the basics of developing Android applications. Excludes advanced topics such as Bluetooth, JSON and sockets.

Course Material: Uses a combination of material from the Official Android training curriculum with customizations for replacing Kotlin with Java when necessary

Pre-Requisites: Intermediate programming skill in some other framework. Ability to use Git. Java training would be interwoven into this course material so a pre-requisite class may not be required.

Day / Course Material	Topics	Detailed topics and notes
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<p>Day 1</p> <p>Build Your First Android App</p> <p>https://developer.android.com/codelabs/build-your-first-android-app</p>	<p>How to use Android Studio to build your app</p> <p>How to run your app on a device on in the emulator</p> <p>How to add interactive buttons</p> <p>How to display a second screen when a button is pressed</p>	<p>Creating a project in Android Studio</p> <p>Creating an emulated Android device for a specific screen size</p> <p>Running an app on an emulator or physical device</p> <p>Using the Android debugger</p> <p>Building screen layouts</p> <p>Exploring the screen view hierarchy</p> <p>Using Property values</p> <p>Using Color in layouts</p> <p>Adding views and constraints (Using the Constraint Layout)</p> <p>Working with Buttons</p> <p>Allowing user interaction</p> <p>Working with Activities</p> <p>Working with Fragments</p>
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<p>Day 2 & Day 3</p> <p>Android Fundamentals</p> <p>https://developer.android.com/courses/kotlin-android-fundamentals/overview#what_does_the_course_cover</p>	<p>Further Examination of Android Fundamentals</p> <ul style="list-style-type: none">- Layouts- Navigation- Activity & Fragment Lifecycle- Architecture Components- Room Database- RecyclerView- Connection to the Internet- Repository	<p>This course uses Kotlin but Java instructions would be provided in addition</p> <p>Linear Layouts and Constraint Layouts</p> <p>Navigation Graph</p> <p>Back stack</p> <p>Use of the Back Button</p> <p>Navigation and Navigation Drawer</p> <p>Jetpack Lifecycle Library</p> <p>MVVM Architecture</p> <p>ViewModel</p> <p>LiveData</p> <p>UI Controllers</p> <p>WorkManager for scheduling background tasks)</p>
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<p>Day 4 & Day 5</p> <p>Advanced Android https://developer.android.com/courses/kotlin-android-advanced/overview</p>	<p>Advanced Android Topics</p> <p>(Advanced topics are not more complex, they are features whose understanding depends on knowing Android fundamentals)</p> <p>Notifications Advanced Graphics Animations Geo Location Testing and Dependency Injection Login</p>	<p>This course uses Kotlin but Java instructions would be provided in addition</p> <p>Creating notifications for the User Creating custom views Drawing on Canvas Objects Creating Effects with Shaders Property Animation Animation with MotionLayout Android Google Maps Adding Geofences to Your Maps Testing Basics Dependency Injection and Test Doubles Testing Coroutines and Jetpack Integrations Android Login with FirebaseUI Android Conditional Navigation with Login</p>
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Additional Courses

Based on discussion of Firefly Integration requirements and review of documents, the following additional courses should be considered.

These would be custom courses that would require further definition and preparation.

Course	Description	Notes
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Bluetooth Length: 1 day	Setting up Bluetooth Scanning for devices Querying Bluetooth Adapter Establishing channels/sockets Connection to remote device Transferring data	Based on tutorial provided by Google for an Android Bluetooth Chat app https://developer.android.com/guide/topics/connectivity/bluetooth There would be time to try to connect to client's actual Bluetooth devices
HTTPS and Sockets Length: 1 day	Using HTTPS Using OkHttp as HTTPS client Using Sockets Java Bit-wise Operations	OkHttp - https://github.com/square/okhttp Socket tutorials that may be used as examples: https://www.tutorialspoint.com/sending-and-receiving-data-with-sockets-in-android https://perihanmirkelam.medium.com/socket-programming-on-android-tcp-server-example-e4552a957c08 https://guides.codepath.com/android/Sending-and-Receiving-Data-with-Sockets
JSON Length: 1 day	JSON Format JSON tools Moshi JSON library for serialization Flipper Network Logging Tool	Moshi - https://github.com/square/moshi

<p>App Review</p> <p>Length: 2 days</p>	<p>Walk-through of any existing apps from external vendors</p>	<p>Code Organization</p> <p>Architecture</p> <p>Discussion of libraries</p> <p>Running the app</p> <p>Making changes</p>
<p>Java Language Training</p> <p>Length: 2 – 3 days</p>	<p>Java Language for Android</p>	<p>Java is now classified by Android as the secondary language for development (Kotlin is classified as the primary language). However, it is still fully supported by Android.</p> <p>It may be preferable for TypeScript developers to take a Java class over a Kotlin class since Kotlin is more like TypeScript (see comparison here: https://gi-no.github.io/kotlin-is-like-typescript/)</p>
<p>Kotlin Language Training</p> <p>Length: 2 – 3 days</p>	<p>Kotlin Language for Android</p>	<p>Although the development team may choose to code in Java, Android is a hybrid environment (it uses both Kotlin and Java for 3rd party libraries, framework libraries, Tutorials, Stack Overflow posts, etc).</p> <p>So it will be useful to be able to read Kotlin code even when that is not the target coding language.</p>