## **raywenderlich.com Gradle Course Outline**

|  |  |
| --- | --- |
| **Course title**  Give your course a preliminary title. | Android Build with Gradle |
| **Instructor(s)**  Who will instruct the course? | Sergio del Amo |
| **Who is this course for?**  What is the target audience and experience level for this course? | Android Developers. Any level. No prerequisite knowledge necessary. |
| **Course learning goals**  What will your target students be able to do by the end of the course? | Get a deeper understanding about Gradle, the build tool used by Android.  Moreover, students will be able to understand the different components of their Android build, be able to apply additional plugins or customize already applied plugins.  They will learn concepts such as multi-project, product flavours and build performance optimization. |
| **Sample app description(s)**  Please describe the sample app(s) you will make for this course.  **Hint**: If possible, try and give the sample app a fun or interesting theme. This will make it easier to add some jokes into the scripts to make the course more fun and entertaining.  A good example is a tutorial on Stripe by Pietro Rea with a app that was "a fully-functional mobile storefront that sells and ships puppies right to your door." | A conference android app for the RW Dev Conf.  For each year, a new variant of the conference app will be generanted. That is used to explain product flavours, variants and build types. We will have two product flavours, one for RW Dev Con 2016 and one for RW Dev Con 2017. |
| **Course narrative / theme**  A good course has a story or narrative that goes throughout the course. This will be a good source for jokes and entertainment, to help keep the student interested. For example:   * Maybe you can’t go on a trip to Disney World until you finish working on this app, which is about packing your bags. * Maybe you start the course with a secret message that you’re very curious about, and make progress on decoding that secret message throughout the course (it turns out to be cat emoji!).   What will be your story or narrative? | In the first part of the course you will learn a little bit of Groovy, specially the features of Groovy that you will most likely encounter in a Gradle build. Basic concepts of Gradle such DAG and tasks are introduced.  In the second part of the course you continue to learn gradle concepts applied to an Android build. Gradle plugins, dependencies and repositories, Gradle android tasks etc.  In the third part of the course, we cover more advanced tasks such as :   * Gradle and CI * Multiproject build * Build-types variants and product flavours. * Kotlin DSL |
| **Curriculum inputs/outputs**  Is your course part of a curriculum? If so, which curriculum and where does it fit in? (Ask your team lead if you don’t know.)  Finally, list out any input knowledge (prerequisite knowledge) and output knowledge (what you will teach specifically). | No input knowledge aside general command line usage.  Output knowledge:   * Basic Groovy Knowledge   + String interpolation   + Closures   + Optional parenthesis   + Dynamic typing. * Gradle knowledge   + Build phases   + Gradle tasks   + Gradle wrapper   + Gradle build files   + Gradle plugins   + Repositories and dependencies   + Multiproject build   + Kotlin DSL   + Optimization tips * Gradle and Android   + Gradle and Android Studio   + Common Gradle tasks in an Android build   + Build variants, build types and product flavours |
| **What I’m going to improve in this update / “Wow” feature**  **Note:** This is for **updates to existing courses** only. If you are making a new course, put N/A here.  Our subscribers expect that a major update to a course includes at least one “wow feature”. This could be coverage of a major new API released at WWDC, or a major refactoring of a few videos, or new coverage of something commonly requested by readers.  We should be able to point to this “wow feature” and say “This new version of the course is better because…”  Take a look at this series, and think of what you can improve in this update, aside from Swift / iOS changes.   * Is there a cool new feature to cover? * Is there anything that was unclear in the original series? * Are there any comments from readers on the forums you can address? * Is there anything extra you can add that would be cool? * Are there any sample projects that could be better? * Could the instruction be more clear through the use of Playgrounds? | N/A |

|  |  |  |  |
| --- | --- | --- | --- |
| Part #1: Gradle | | | |
| Video Title | Video Type | What will you do in this video? | Length |
| 1. Introduction | Lecture | I will introduce the students to Gradle. I will explain Google’s adoption of Gradle as Android’s build tool but also the role of Gradle as a build tool for server side apps and apps outside of the JVM ecosystem. It is used by companies such as LinkedIn and Netflix.  An introduction about the role of Gradle in the build tools ecosystem. A comparison with Maven, Gradle and Ant will be provided.  I will emphasize that understanding how Gradle works is key for an Android developer since it is a technology interacting with all day long.  I will introduce the rest of the course.  For the part 2 and 3, your first Kotlin Android App and Second Kotlin Android app is recommended. Also, by the end of course we are going to discuss Gradle Kotlin DSL, programming in Kotlin is recommended. | 2-3 min |
| 2. Gradle installation and Gradle Wrapper | Exercise | Talking head: Explain how to install via download and sdkman. Explain that they will actually not need to install it to build android apps.  Demo: I will show how to install Gradle with SDKMan.io  Mention that the viewer can just follow along watching if they wish not to install Gradle since the rest of the course will use the gradle wrapper. | 1-3m |
| 3. Groovy for Gradle users | Lecture | I will introduce the students to Groovy. Specially those feature which they may find in the context of a Gradle build. | 8-10 m |
| 4. Gradle Wrapper | Exercise | Talking Head: I will explain the viewers about Gradle wrapper.  Show Gradle tasks.  Demo: Create a sample skeleton with gradle init. Show how to create a gradle project with IntelliJ or with Android Studio. I will show how to run gradle wrapper and run a task. *./gradlew tasks --all* | 2-5m |
| 5. Gradle tasks | Exercise | I will introduce how to write tasks, configuration and execution phase | 3-6 m |
| 6.Write your own tasks | Challenge | Prompt the user to create a Gradle project with the gradle wrapper, write a custom task and execute it. | 2-4m |
| 7. Ad-hoc vs Typed tasks | Exercise | Explain the difference between Adhoc & Typed tasks and show some useful typed tasks such as Copy or Delete. | 2-5m |
| 8. Directed Acyclic Graph | Exercise | Talking head. Directed Acyclic Graph.  Demo about dependsOn, mustRunAfter, finalizedBy. Explain group | 3-6m |
| 9. Execution order | Challenge | Create a Gradle project, apply the base plugin and create two task which execute when you invoke `build `and run one after the other. | 2-5m |
| 10. Conclusion | Lecture | Recap the user what they have learned: how to install gradle, about the wrapper, groovy, tasks and DAG. Prompt them to continue watching since we are going to apply what we learned with an android app. | 1 min |

|  |  |  |  |
| --- | --- | --- | --- |
| Part #2: Beginner Gradle and Android | | | |
| Video Title | Video Type | What will you do in this video? | Length |
| 1. Introduction | Lecture | Introduce the topics we will cover in part 2. | 1-2 min |
| 2. Walk through Android build.gradle and app/build.gradle | Exercise | In this video we will talk about the Gradle files included when you create an android app and specially we will cover the contents of build.gradle and app/build.gradle.  Talk about Android Studio Gradle Plugin (AGP) and how it is versioned with releases of Android Studio. Show how Android Studio prompts you to upgrade the AGP and Gradle versions opening a project that references old versions. | 3-6m |
| 3. Repositories and dependencies | Exercise | Talking about repositories, dependencies and buildscript repositories and dependencies and plugins. Discuss the dependencies task and how to exclude a transitive dependency | 5-10m |
| 4. Gradle Plugins | Exercise | In this video we talk about how Gradle plugins and how to enhance an Android build adding more plugins.  Talk about com.github.ben-manes.versions plugin and stats: https://plugins.gradle.org/plugin/org.kordamp.gradle.stats | 3m-6m |
| 5. Add the license plugin | Challenge | Prompt the user to add the license gradle plugin to a sample app, run the gradle task and fix the issues encountered. | 2-5m |
| 6. Extra properties and gradle.properties | Exercise | Shows how to keep your android build dry using Extra properties and gradle.properties | 2m-5m |
| 7. Common Gradle Tasks in Android | Exercise | Discuss Common gradle tasks in Android project and show them in the Android Studio UI and in a terminal. | 2m - 5m |
| 8. Install with Gradle | Challenge | Run an app in a simulator by running a Gradle task, uninstall using a gradle task | 2-4m |
| 9. Customizing apk name | Exercise | Show how to modify some properties of a common task to generate a custom apk name. | 2-4m |
| 10 Part 2 Conclusion | Lecture | Recap the user what they have learned: Android build, dependencies, add gradle plugins, common gradle tasks in an Android app. | 1 min |

|  |  |  |  |
| --- | --- | --- | --- |
| Part #3: Advanced Gradle and Android | | | |
| Video Title | Video Type | What will you do in this video? | Length |
| 1. Introduction | Lecture | Introduce the last part of the course | 1m |
| 2. Test tasks and test reports | Exercise | Introduce the test tasks and generated test reports. Also, show how to add more verbosity to test output. | 2-5m |
| 3. Run and fix a test | Challenge | Ask the user to run the tests of a project with a failing test, open the reports and fix the test | 2-5m |
| 4. Android and CI | Exercise | Show how to run Android build in a continuous integration server such as Circle CI. | 3-6m |
| 5. Build Variant | Exercise | Flavors, build types and build variants. Show how to create two flavours one for RW Dev Con 2016 and one for RW Dev Con 2017. | 5m - 10m. |
| 6. Change variant app name | Challenge | Ask the user to change the app name for each variant | 2-4m |
| 7.Multi-project build | Excercise | Show how to create a multiproject build in gradle and split the sample app in a multiproject build where we extract non android classes to a separated module. | 3-6m |
| 8. Gradle Tips for faster builds | Exercise | In this video we discuss the different tips to increase the speed of a gradle build. | 5-10m |
| 9. Android Tips for faster builds | Exercise | In this video we discuss the different tips to increase the speed of an Android/gradle build. | 5-10m |
| 10. Kotlin Gradle DSL | Exercise | In this video we introduce the Gradle Kotlin DSL. Why Gradle is investing in a Kotlin DSL and how it compares with Groovy DSL. | 5-10m |
| 11. Conclusion | Lecture | We thank the viewers for completing the course and recap all they have learned and point them to resources to improve their gradle learning experience. E.g. guides.gradle.org | 2-4m |