UDACITY
FOR ENTERPRISE

SCHOOL OF PROGRAMMING AND DEVELOPMENT

Android Kotlin Developer

NANODEGREE SYLLABUS

Overview

This Nanodegree is Built in Partnership With

Google

This Nanodegree Program prepares you to become a professional Android developer, and allows you to create a diverse portfolio. By the end of this program you will be able to use Android Studio, Android Jetpack and Kotlin to build your own applications.

A graduate of this program will be able to:

- Design engaging interfaces that implement modern Android components.
- Incorporate remote data into an app by utilizing RESTful interfaces and web APIs.
- Organize, store, retrieve, and display content on an Android device to provide users with a more consistent, performant, and accessible experience, even while offline.
- Integrate hardware capabilities such as location to provide users with mobile enriched features within an Android app.
- Architect an Android app using the established MVVM pattern for scalability and performance.

This program is comprised of 4 courses and 5 projects. Each project you build will be an opportunity to demonstrate what you've learned in the lessons. Your completed projects will become part of a career portfolio that will demonstrate your acquired skills as a Android Kotlin Developer.

Program Information

ESTIMATED TIME TO COMPLETE

4 months; study 10 hrs/week

LEVEL

Practitioner

PREREQUISITES

- Be comfortable with Object-Oriented Programming and the Android platform.
- Have experience navigating GitHub, and be comfortable using a Modern IDE.
- Be familiar with threads and concurrency, and with modular app architectures.

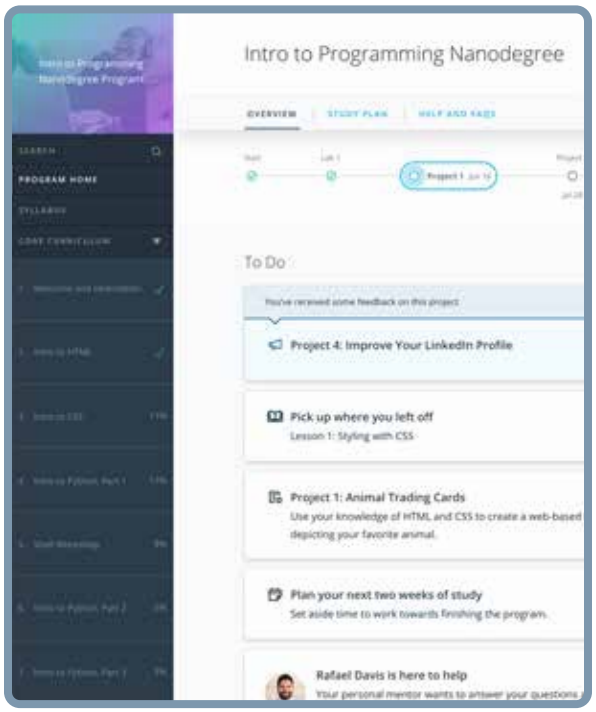
HARDWARE/SOFTWARE REQUIRED

- A personal computer that is capable of running Android Studio
- Access to an Android device is helpful, but not necessary.

LEARN MORE ABOUT THIS NANODEGREE

Contact us at enterpriseNDs@udacity.com.

Our Classroom Experience



REAL-WORLD PROJECTS

Learners build new skills through industry-relevant projects and receive personalized feedback from our network of 900+ project reviewers. Our simple user interface makes it easy to submit projects as often as needed and receive unlimited feedback.

KNOWLEDGE

Answers to most questions can be found with Knowledge, our proprietary wiki. Learners can search questions asked by others and discover in real-time how to solve challenges.

LEARNER HUB

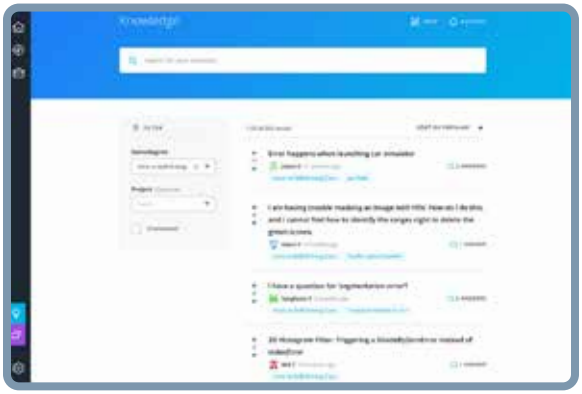
Learners leverage the power of community through a simple, yet powerful chat interface built within the classroom. Learner Hub connects learners with their technical mentor and fellow learners.

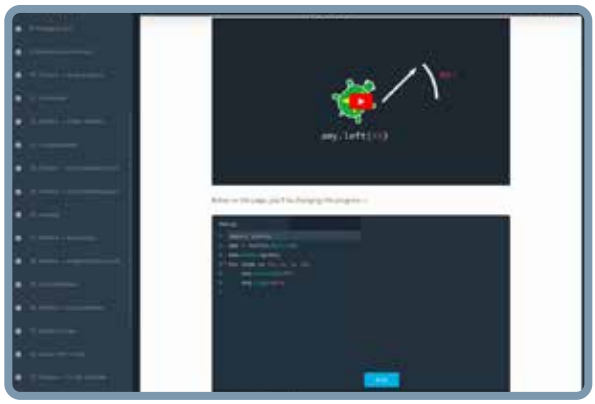
WORKSPACES

Learners can check the output and quality of their code by testing it on interactive workspaces that are integrated into the classroom.

QUIZZES

Understanding concepts learned during lessons is made simple with auto-graded quizzes. Learners can easily go back and brush up on concepts at anytime during the course.





CUSTOM STUDY PLANS

Mentors create a custom study plan tailored to learners' needs. This plan keeps track of progress toward learner goals.

PROGRESS TRACKER

Personalized milestone reminders help learners stay on track and focused as they work to complete their Nanodegree program.

Learn with the Best

Dan Galpin

INSTRUCTOR

Dan Galpin is a Developer Advocate for Android at Google, focusing on Android performance tuning, developer training, and games. He has over 10 years of experience in mobile, developing at almost every layer of the phone stack.

Aleks Haecky

INSTRUCTOR

Aleks is a Writer and Developer Advocate with over 20 years of experience developing media and tools that bring technologies and programming to developers. They believe in the power of education, and Android development as a skill that can change lives.

Sean McQuillan

INSTRUCTOR

Sean has a decade of experience as a startup engineer in San Francisco where he learned how to build successful apps. Sean is passionate about building high quality products - quickly. When he is not working on Android you can find him fiddling on the piano or crocheting hats.

Murat Yener

INSTRUCTOR

Murat has been an Android Developer back to Froyo, worked on wearable and other form factor Android devices. He is a code geek, open source committer, Java Champion and the author of Expert Android Studio and Professional Java EE Design Patterns books.

Chet Hasse

INSTRUCTOR

After being on, and leading, the UI Toolkit team on Android for several years, Chet joined the Developer Relations team. His focus and passions: UI, graphics, animation, performance, and anything that puts the pixels on the screen, in addition to helping developers write great apps.

Meghan Mehta

INSTRUCTOR

Meghan is a Developer Advocate on the Android team. She has been a mobile developer for many years at Disney, Foursquare, Yelp and now Google. She loves sharing her knowledge and experience with other developers. When she is not working you can find her singing, dancing, or baking!

Caren Chang

INSTRUCTOR

Caren is a Developer Programs Engineer for the Android Frameworks team at Google.

Lyla Fujiwara

INSTRUCTOR

Lyla authored many of the fundamental Android samples and trainings for Android Jetpack, Kotlin and testing. She's also taught everyone from high-school students to senior developers how to make Android apps. These days, she's part of the team bringing you the Google News Android app.

Asser Samak

INSTRUCTOR

Aser has been building educational Android apps with Udacity & Google for the past 4 years, he enjoys teaching with a focus on best-practices and building a solid foundation at an early stage. Aser loves solving the Rubik's cube which is featured in many of his videos—try to find them all.

Learn with the Best

Joshua Donlan

INSTRUCTOR

Joshua has 20 years experience as a web and mobile application developer helping launch multiple startups and grow established companies alike. His client portfolio includes Fortune 100 companies Audi, Disney, Mitsubishi, American Express, BD Pharmaceuticals, and more.

Kevin Moore

INSTRUCTOR

Kevin has been doing Android development for over 9 years, developing many different types of apps. In addition, Kevin has been writing articles, Tech editing books, and creating videos for raywenderlich.com and LinkedIn Learning.

Jesus Valdez

INSTRUCTOR

Kevin is a mechatronics engineer with an MS in machine learning. He works as a mobile developer, and is proficient in: Mobile Development, Image Processing, Machine Learning, Electronics, and Automation.

Aida Issayeva

INSTRUCTOR

Aida is an Android Engineer at Clarity Money, a personal finance management app. Previously, she built android applications for various industries, from cloud gaming services to satellite data communications. When she's not coding, she's chasing great food experiences all over the world.

Mohamed Habib

INSTRUCTOR

Mohamed is an experienced Android Engineer with 5 years of experience, passionate about teaching and mentoring, he has a strong engineering professional with a bachelor's degree in Computer Science from Ain Shams University.

Course 1: Developing Android Apps, Part 1

In this course, use common Android UI components to build a basic user interface, handle user input and Android lifecycle events, and create dynamic and navigable interfaces using constraint-based layouts. You'll also learn how to use the Gradle build process to declare library dependencies and establish application parameters, and integrate application functionality with other applications or components with Android.

Project 1 — Build a Shoe Store Inventory App

In this project, you will build an Android application with Kotlin! You will build a multi-screen Android app and create a navigation graph to take the user through the app. You will use fundamental Android development skills to set up a development environment for an Android app, use Android Studio's Layout Editor, and implement best practices for navigation and user interface in Android. You'll also follow recommended Android app architecture guidance with ViewModel and LiveData lifecycle classes.

LESSON TITLE	LEARNING OUTCOME
BUILD YOUR FIRST APP	• Explore the basics of Android, such as creating text, images, and interactiv e buttons • Set up the development environment and create a Dice Roller Android app • Navigate the Main Map Anatomy of an Android app.
LAYOUTS	• Learn different kinds of views and resources • Explore arranging elements with the Android Studio's Layout Editor • Connect views with data through data binding.
APP NAVIGATION	• Learn how to build apps that contain multiple screens known as destinations • Use Android Studio tools to create and visualize a map, or graph, of destinations that show navigation paths in your app • Learn the navigation patterns and user interface that Android users expect to see, so that your app will be intuitive and familiar

Nanodegree Program Overview

LESSON TITLE	LEARNING OUTCOME
ACTIVITY AND FRAGMENT LIFECYCLE	• Learn all about the Android Activity Lifecycle • Create a one-screen app called Dessert pusher • Debug common issues through an understanding of lifecycles
APP ARCHITECTURE (UI LAYER)	• Learn one way to structure an Android app and the benefits that come with this design • Learn about two classes in the lifecycle library: ViewModel and LiveData

Course 2: Developing Android Apps, Part 2

In this course, you will learn how to implement data persistence in your application, display collections of data to users using RecyclerView, and use APIs to connect to, store, and retrieve data. You will also learn best practices of Material Design to create a quality user experience and learn how to make an app more accessible to as many users as possible.

Project 2 — Build an Asteroid Radar App

In this project, you will build an app using a free, open source API provided by the NASA JPL Asteroid team. You will create an application that connects to the internet to retrieve and display live data, implement networking best practices to fetch and display data and images, and create a database to store and access user data over time. You will also learn to use RecyclerView to create a clear and compelling UI to display the data. Finally you will test your app with Talkback enabled and make your app more accessible for as many users as possible.

LESSON TITLE	LEARNING OUTCOME
RECYCLER VIEW	• Implement the ViewHolder pattern to optimize performance when displaying large sets of data with RecyclerView. • Display large collections of data in a user consumable and navigable format. • Optimize application performance when updating data collections that affect the UI.

LESSON TITLE	LEARNING OUTCOME
CONNECT TO THE INTERNET	• Build an application that connects to an internet server to retrieve and display live data • Simplify fetching data and images, to make sure the app reasonably conforms to networking and image loading best practices
BEHIND THE SCENES	• Learn how to implement offline caching by building an app that lets users watch DevByte videos • Take an online-only app and transform it to work offline by adding offline caching
DESIGNING FOR EVERYONE	• Improve your app design to support multiple languages as well as support multiple device sizes and orientations • Learn how to make your app accessible for users who might need assistance navigating, like supporting talkback and push-button navigation

Course 3: Advanced Android Apps with Kotlin, Part 1

In this course you will learn how to enhance your application's functionality and drive user engagement using Android's robust notification system, build custom views, and use canvas drawing to allow for the update of a display based on data or user interactions. You will also be able to create simple animations to enhance the presentation of content and overall usability of the application.

Project 3

Design an App with Application Loading Status

In this project you will create an Android app that will download a file from the internet, and create notifications, custom views and animations to build a status bar in your app. You will be able to create a notification to send messages to a user within an Android app, and design and style the notifications. You will also build custom views using canvas and paint, animate UI elements with property animations, and use MotionLayout to enhance the user experience of your app.

LESSON TITLE	LEARNING OUTCOME
USING NOTIFICATIONS	• Send messages to users using notifications • Design and style notifications • Add buttons and actions to notifications • Send push messages using Firebase Cloud Messaging

Nanodegree Program Overview

LESSON TITLE	LEARNING OUTCOME
CREATING CUSTOM VIEWS	• Create custom views for your app
DRAWING ON CANVAS OBJECTS	• Build an app that allows users to paint directly on the screen
CLIPPING CANVAS OBJECTS	• Create and display transformed and clipped regions to the screen • Translate the origin of a drawing surface of a region • Draw multiple shapes on a canvas
ANDROID PROPERTY ANIMATIONS	• Use animations to draw attention to important UI elements and beautiful designs • Animate UI elements with property animations
USING MOTION LAYOUT TO ANIMATE ANDROID APPS	• Use declarative XML with MotionLayout to coordinate animations across multiple views

Course 4: Advanced Android Apps with Kotlin, Part 2

In this course you will learn how to build an app with location awareness and Google Maps. You will also learn best practices and techniques for testing to enable you to scale your app quickly and safely, while mitigating any negative effects, and how to use Firebase for authentication and remote storage.

Project 4 — Build a Location Reminder App

In this project, you will build a To-do List app that includes Google Maps and location services. You'll learn how to add Google Maps and style map views in your Android application, and enable location services and tracking. With location services and reminders, your app will remind users to perform an action when the user is at a specific location.

Capstone Project — Design and Build an Android Application

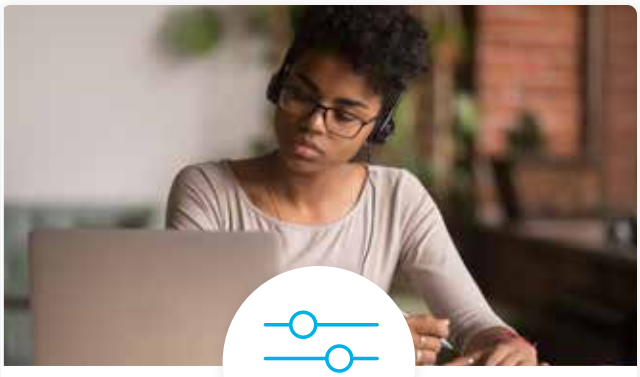
In this project, you will have the opportunity to design and build either 1) a custom Android application inspired by your own idea or 2) a Political Preparedness application that will deliver civic data to end users via the app. You'll apply skills acquired throughout the Nanodegree to design an engaging user interface that incorporates data from RESTful interfaces and web APIs, and utilizes mobile hardware to enhance application functionality and provide an engaging user experience. The project will allow you to showcase recommended Android app architecture patterns, delivering a highly functional and scalable application that takes full advantage of the Android platform.

LESSON TITLE	LEARNING OUTCOME
WANDERING IN GOOGLE MAPS WITH KOTLIN	• Add Google Maps functionality to an Android app • Style Google Maps views in multiple ways in an Android app
VIRTUAL TREASURE HUNT WITH GEOFENCES	• Enable location services and tracking
TESTING BASICS	• Learn how to test your app before distribution to avoid crashes or unpredictable behavior

Nanodegree Program Overview

LESSON TITLE	LEARNING OUTCOME
Introduction to Test Doubles and Dependency Injection	• Use test doubles and dependency injection to test an app • Write tests with Espresso for UI testing • Use mockito to create an integration test
Survey of Advanced Testing Topics	• Implement end to end testing using navigation, coroutines, room and databinding.
Implementing Login on Android with FirebaseUI	• Implement user login and identity management for your app using the open-source library FirebaseUI • Enable login and logout for your app's users • Control navigation in your app based on whether a user is logged in

Our Nanodegree Programs Include:



Pre-Assessments

Our in-depth workforce assessments identify your team's current level of knowledge in key areas. Results are used to generate custom learning paths designed to equip your workforce with the most applicable skill sets.

Dashboard & Progress Reports

Our interactive dashboard (enterprise management console) allows administrators to manage employee onboarding, track course progress, perform bulk enrollments and more.

Industry Validation & Reviews

Learners' progress and subject knowledge is tested and validated by industry experts and leaders from our advisory board. These in-depth reviews ensure your teams have achieved competency.

Real World Hands-on Projects

Through a series of rigorous, real-world projects, your employees learn and apply new techniques, analyze results, and produce actionable insights. Project portfolios demonstrate learners' growing proficiency and subject mastery.

Our Review Process

Real-life Reviewers for Real-life Projects

Real-world projects are at the core of our Nanodegree programs because hands-on learning is the best way to master a new skill. Receiving relevant feedback from an industry expert is a critical part of that learning process, and infinitely more useful than that from peers or automated grading systems. Udacity has a network of over 900 experienced project reviewers who provide personalized and timely feedback to help all learners succeed.

Vaibhav
UDACITY LEARNER

"I never felt overwhelmed while pursuing the Nanodegree program due to the valuable support of the reviewers, and now I am more confident in converting my ideas to reality."

now at
CODING VISIONS INFOTECH

All Learners Benefit From:

- Line-by-line feedback for coding projects
- Industry tips and best practices
- Advice on additional resources to research
- Unlimited submissions and feedback loops

How it Works

Real-world projects are integrated within the classroom experience, making for a seamless review process flow.

- Go through the lessons and work on the projects that follow
- Get help from your technical mentor, if needed
- Submit your project work
- Receive personalized feedback from the reviewer
- If the submission is not satisfactory, resubmit your project
- Continue submitting and receiving feedback from the reviewer until you successfully complete your project

About our Project Reviewers

Our expert project reviewers are evaluated against the highest standards and graded based on learners' progress. **Here's how they measure up to ensure your success.**

900+

Expert Project Reviewers

Are hand-picked to provide detailed feedback on your project submissions.

1.8M

Projects Reviewed

Our reviewers have extensive experience in guiding learners through their course projects.

3

Hours Average Turnaround

You can resubmit your project on the same day for additional feedback.

4.85 /5

Average Reviewer Rating

Our learners love the quality of the feedback they receive from our experienced reviewers.

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For more information visit: **www.udacity.com/enterprise**