Android Development Course Module

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Course Description:

This course will ensure you to able to learn Android Development like a professional. This course covers about all the topics on Android Development like – Core Java Programming with OOP, Kotlin Basics, OOP in Kotlin, Data Structures and Algorithms, Android Framework in depth.
This document contains all the tutorials in a systematic order starting from beginner's level to the advanced topics. Whether you are a College student/Polytechnic student/University student looking to learn Android Development or a company employee want to learn advanced Android Development. This Course would definitely be useful for you. Let's start.

Course Topics:

- ***Core Java Programming***
- ***Basic Understanding Of Data Structures and Algorithms***
- ***Object Oriented Programming Concept in Java***
- ***Kotlin Basics***
- ***Object Oriented Programming Concept in Kotlin***
- ***Android Framework***
- ***Class Tests(Basic Programming, OOP, Android Framework)***
- ***Source control system (git)***
- ***Working with real life projects (Project-1, Project-2)***
- ***Code repository maintenance for entire course***

Core Java Programming:

1. Introduction to Java Programming
2. Basic Understanding Of Data Structures and Algorithms
3. Java Virtual Machine (JVM) Basics
4. Lexical Issues
    - Whitespace
    - Identifiers
    - Literals
    - Comments
    - Separator
5. Reserved Keywords in Java
6. Java Data Types
    - What is statically-typed language?
    - Primitive Data Types
        1. byte
        2. short
        3. int
        4. long
        5. char
        6. float
        7. double
        8. boolean
7. Variables in Java
    - Declaring Variables
    - Dynamic Initialization of Variables
    - The Scope and Lifetime of Variables
8. Arrays in Java
    1. One dimensional array
    2. Multi dimensional array
    - Array Declarations in Multiple way

9. Java Operators
    1. Assignment Operators
    2. Relational Operators
    3. Arithmetic Operators
    4. Conditional Operators
    5. Logical Operators
    - Some tricky operations of Operators
10. Control Statements
    1. if(){} – else if(){}-else{}
    2. switch-case
11. Loops in java
    1. For loop
    2. While loop
    3. Do-while loop
    4. Enhanced loop
    5. Nested Loop
    - continue and break statement in loop
    - Some implementations of loop

Basic Understanding Of Data Structures and Algorithms

1. Why do you need to learn data structures and algorithms?
2. Applications of Data Structure and Algorithm
    1. Search
    2. Sort
    3. Insert
    4. Update
    5. Delete

Object Oriented Programming Concept in Java

1. Introducing Classes
    - Class Fundamentals
    - General form of a class
    - Create Object of a class
    - Object reference of variable
    - Methods
        - Fundamental of methods
        - Returning value from methods
        - Parameters & Arguments what are them.
        - Recursive method
    - Constructor
    - this keyword
    - Garbage Collection
    - Finalize
2. Access Modifiers
    1. Public
    2. Private
    3. Protected
    4. Default
3. A closer look at Methods and Classes
    - Overloading methods
    - Overloading constructors
    - Using Object as Parameter
    - Returning objects
    - Ambiguity of methods
    - Nested and inner class

4. Inheritance
    - Inheritance basics
    - Super Keyword for super class constructor call and method call
    - Method overriding
    - Why method overriding needed?
    - How to prevent overriding
    - Using final keyword to prevent inheritance
5. Encapsulation
6. Polymorphism
7. Abstraction
8. Design principles Singleton class, Factory method, Strength of static and final
9. Exception Handling
    - What is exception in programming?
    - Exception Handling Fundamentals
    - Exception types
    - Uncaught exception
    - Using try-catch-finally
    - Nested try-catch
    - Throw and throws
10. Package and Interfaces
11. Interface vs Abstract class
12. Collection frameworks
13. Generic Abstraction vs Interface

Kotlin Basics

*[NB. We will discuss all the topics of **Core Java Programming** contents. Definitely there is difference between java and kotlin syntaxes and programming procedures.]*

Object Oriented Programming Concept in Kotlin

[NB. We will discuss all the oop concept covers in Java OOP.]

Android Framework

What is Android?

The platform changing what mobile can do.

Android is a mobile operating system based on a modified version of the Linux kernel and other open source software, designed primarily for touchscreen mobile devices such as smartphones and tablets. Android is developed by a consortium of developers known as the Open Handset Alliance, with the main contributor and commercial marketer being Google. Source-wikipedia

Powering your phone, tablet, watch, TV and car.

When a device goes from just working to actually making life easier, Android is behind it. It's the reason your GPS avoids traffic, your watch can text and your Assistant can answer questions. It's the operating system inside 2.5 billion active devices. Everything from 5G phones to stunning tablets, Android powers them all.

Always pushing what's possible.

Android is open to everyone: developers, designers and device makers. That means more people can experiment, imagine and create things the world has never seen.

Technology that's useful For everyone.

Everyone has their own way of using their devices. That's why we build accessible features and products that work for the various ways people want to experience the world. Screen readers, sound mufflers, even AR walking guides. Because when it comes to technology, there's no one-size-fits all.

1) Introduction To Mobile Apps

I. Why we Need Mobile Apps
II. Different Kinds of Mobile Apps
III. Briefly about Android

2) Introduction Android

I. History Behind Android Development
II. What is Android?
III. Pre-requisites to learn Android
IV. Brief Discussion on Java Programming

3) Android Architecture

I. Overview of Android Stack
II. Android Features
III. Introduction to OS layers

4) Deep Overview in Android Stack

I. Linux Kernel
II. Libraries
III. Android Runtime
IV. Application Framework
V. Dalvik VM

5) Installing Android Machine

I. Configuring Android Staffs
II. Setting up Android Studio
III. Working with Android Studio
IV. Using Older Android Tools

6) Creating First Android Application

I. Creating Android Project
II. Debugging Application through DDMS
III. setting up environment
IV. AVD Creation
V. Executing Project on Android Screen

7) Android Components

I. Activities
II. Services
III. Broadcast Receivers
IV. Content Providers

8) Hello World App

i. Creating your first project
II. The manifest file
III. Layout resource
IV. Running your app on Emulator

9) Building UI with Activities

I. Activities
II. Views, layouts and Common UI components
III. Creating UI through code and XML
IV. Activity lifecycle
V. Intents
VI. Communicating data among Activities

10) Advanced UI

I. Selection components (GridView, ListView, Spinner, RecyclerView)
II. Adapters, Custom Adapters
III. Complex UI components

IV. Building UI for performance
V. Menus
VI. Creating custom and compound Views

11) Notifications

I. Toast, Custom Toast
II. Dialogs
III. Status bar Notifications

12) Multithreading

I. Using Java Mutithreading classes
II. AsyncTask
III. Handler
IV. Post
V. Writing an animated game

13) Styles And Themes

I. Creating and Applying simple Style
II. Inheriting built-in Style and User defined style
III. Using Styles as themes

14) Resources and Assets

I. Android Resource
II. Using resources in XML and code
III. Localization
IV. Handling Runtime configuration changes

15) Intent, Intent Filters and Broadcast Receivers

I. Role of filters
II. Intent-matching rules
III. Filters in your manifest
IV. Filters in dynamic Broadcast Receivers
V. Creating Broadcast receiver

Receiving System Broadcast

VI. Understanding Broadcast action, category and data
VII. Registering Broadcast receiver through code and through XML
VIII. Sending Broadcast

20) Location Based Services and Google Maps

I. Using Location Based Services
II. Finding current location and listening for changes in location
III. Proximity alerts
IV. Working with Google Maps
i. Showing google map in an Activity
ii. Map Overlays
iii. Itemized overlays
iv. Geocoder
v. Displaying route on map

21) Web Services and WebView

I. Consuming web services
II. Receiving HTTP Response (XML, JSON)
III. Parsing JSON and XMLIV. Using WebView

22) Sensors

I. How Sensors work
II. Using Orientation and Accelerometer sensors
III. Best practices for performance

23) WiFi

I. Monitoring and managing Internet connectivity
II. Managing active connections
III. Managing WiFi networks

24) Telephony Services

I. Making calls
II. Monitoring data connectivity and activity
III. Accessing phone properties and status
IV. Controlling the phone
V. Sending messages

25) Camera

I. Taking pictures
II. Media Recorder
III. Rendering previews

26) Bluetooth

I. Controlling local Bluetooth device
II. Discovering and bonding with Bluetooth devices
III. Managing Bluetooth connections
IV. Communicating with Bluetooth

26) More

I. Fragments
II. Material Design
III. Gradle
IV. NEW TOPICS: Since each new version of Android has new features, we keep extra time for adding custom topics in every batch. You can request any Android Topic.

28) Android Application Deployment

I. Android Application Deployment on device with Linux and Windows
II. Android Application Deployment on Android Market