

**Certified Android Apps Developer
(Detailed Curriculum)**

Module Wise Learning Outcomes

Module Unit	Duration (Theory) in Hours	Duration (Practical) in Hours	Learning Objectives
Introduction of Android	6	4	After completing this unit, Learner will be able to <ul style="list-style-type: none"> • Know what is android. • Know the architecture of android. • Know about Linux kernel. • Know about android SDK. • Learn why android is so much popular. • About the IDE's.
About Android Studio IDE	8	12	After completing this unit, learner will be able to <ul style="list-style-type: none"> • Know how to install android studio • Know about creation of project • Debugging and Release the app • Android Virtual Device
Acquiring Skills to Create Applications and Activities with java and kotlin	14	12	After completing this unit, Learner will be able to <ul style="list-style-type: none"> • Know about project creation. • Understand different components of a project. • Know about how java involved with the project • Understand some important features of core java • Activity process. • Know about how kotlin involved with the project • Understand some important features of kotlin. • Activity process
Core Skills to Create User Interface and	12	16	After completing this unit, Learner will be able to understand the

Intents with java and kotlin			<ul style="list-style-type: none"> • Understand different types of views/components. • Know about layouts. • Implementation of different layouts. • Know about intents.
Advance Skills to Understand Broadcast Receiver, Adapters and Internet with java and kotlin	14	18	<p>After completing this unit, Learner will be able to</p> <ul style="list-style-type: none"> • Launch activity using intents. • Broadcast events using intents. • Know about array adapter.
Acquiring The Skills To Create Files, Saving Files with java and kotlin	14	18	<p>After completing this unit, Learner will be able to</p> <ul style="list-style-type: none"> • Saving application data. • Native preference controls. • Saving activity state. • Saving instance state.
Acquiring The Skills To Manage Application With Database with java and kotlin	12	20	<p>After completing this unit, Learner will be able to</p> <ul style="list-style-type: none"> • Know about android database. • Know about SQLite. • Know about firebase. • Adding updating and removing rows.
Projects Discussion and uploading app.	10	20	<ul style="list-style-type: none"> • Phone calling. • Notification app. • Messaging. • Integration of youtube. • Student registration system. • Upload app on playstore.

Detailed Syllabus:

(i) Introduction of Android:

Introduction about android operating system. Why android is so much popular? Android history with different versions. Architecture of android. Linux kernel. Open Handset Alliance. Android application framework. Android stack. About API, Android SDK, About Android Studio installation and setup, and a tour on android studio to know about this IDE, Android SDK Features, Access to Hardware, Including Camera, GPS, and Accelerometer, Native Google Maps, Geocoding, and Location-Based Services, Background Services, SQLite Database for Data Storage and Retrieval, Shared Data and Inter application

Communication, Using Widgets, Live Folders, and Live Wallpaper to Enhance the Home Screen, Extensive Media Support and 2D/3D Graphics, Optimized Memory and Process Management, Introducing the Open Handset Alliance, Changing the Mobile Development Landscape, Introducing the Development Framework, What Comes in the Box, Understanding the Android Software Stack, The Dalvik Virtual Machine, Android Application Architecture, Android Libraries, Summary.

(ii) About Android Studio:

Developing for Android, What You Need to Begin, Downloading and Installing the SDK, Creating Your First Android Application, Starting a New Android Project, Creating a Launch Configuration, Running and Debugging Your Android Applications, Understanding Hello World, Types of Android Applications, Foreground Applications, Background Services and Intent Receivers, Intermittent Applications, Widgets, Developing for Mobile Devices, Hardware-Imposed Design Considerations, Be Efficient, Expect Limited Capacity, Design for Small Screens, Expect Low Speeds, High Latency, Considering the Users' Environment, Developing for Android, Being Fast and Efficient, Being Responsive, Developing Secure Applications, Ensuring a Seamless User Experience, To-Do List Example, Android Development Tools, The Android Virtual Device and SDK Manager, Android Virtual Devices, SDK Manager, The Android Emulator, Dalvik Debug Monitor Service (DDMS), The Android Debug Bridge (ADB), Summary.

(iii) Acquiring Skills to Create Applications and Activities with java and kotlin:

Introducing the Application Manifest, Using the Manifest Editor, The Android Application Life Cycle, Understanding Application Priority and Process States, Externalizing Resources, Creating Resources, Creating Simple Values Styles and Themes, Drawables, Layouts, Animations, Menus, Using Resources, Using Resources in Code, Referencing Resources within Resources, Using System Resources, Referring to Styles in the Current Theme, To-Do List Resources Example, Creating Resources for Different Languages and Hardware, Runtime Configuration Changes, Overriding the Application Life Cycle Events, A Closer Look at Android Activities, Creating an Activity, The Activity Life Cycle, Activity Stacks, Activity States, Monitoring State Changes, Understanding Activity Lifetimes, Android Activity Classes, Summary.

(iv) Core Skills to Create User Interface and Intents with java and kotlin:

Fundamental Android UI Design, Introducing Views, Creating Activity User Interfaces with Views, The Android Widget Toolbox, Introducing Layouts, Using Layouts, Optimizing Layouts, Creating New Views, Modifying Existing Views, Customizing Your To-Do List, Creating Compound Controls, Creating Custom Views, Creating a New Visual Interface, Handling User Interaction Events, Creating a Compass View Example, Creating and Using Menus, Introducing the Android Menu System, Defining an Activity Menu, Menu Item Options, Dynamically Updating Menu Items, Handling Menu Selections, Submenus and Context Menus, Creating Submenus, Using Context Menus, Defining Menus in XML, To-Do List Example Continued, Summary.

(v) Advance Skills to Understand Broadcast Receiver, Adapters and Internet with java and kotlin:

Introducing Intents, Using Intents to Launch Activities, Explicitly Starting New Activities, Implicit Intents and Late Runtime Binding, Returning Results from Activities, Native Android Actions, Using Intent Filters to Service Implicit Intents, How Android Resolves Intent Filters,

Finding and Using the Launch Intent Within an Activity, Passing on Responsibility, Select a Contact Example, Using Intent Filters for Plug-Ins and Extensibility, Using Intents to Broadcast Events, Broadcasting Events with Intents, Listening for Broadcasts with Broadcast Receivers, Native Android Broadcast Actions, Introducing Pending Intents, Introducing Adapters, Introducing Some Native Adapters, Customizing the Array Adapter, Using Adapters for Data Binding, Customizing the To-Do List Array Adapter Using the Simple Cursor Adapter, Using Internet Resources, Connecting to an Internet Resource, Using Internet Resources, Introducing Dialogs, Introducing the Dialog Classes, The Alert Dialog Class, Specialist Input Dialogs, Using Activities as Dialogs, Managing and Displaying Dialogs, Summary

(vi) Acquiring The Skills to Create Files, Saving Files with java and kotlin:

Saving Simple Application Data, Creating and Saving Preferences, Retrieving Shared Preferences, Introducing the Preference Activity and Preferences Framework, Defining a Preference Screen Layout in XML, Native Preference Controls, Using Intents to Import System Preference Screens, Introducing the Preference Activity, Finding and Using Preference Screen Shared Preferences, Introducing Shared Preference Change Listeners, Creating a Standard Preference Activity for the Earthquake Viewer, Saving Activity State, Saving and Restoring Instance State, Saving the To-Do List Activity State, Saving and Loading Files, Including Static Files as Resources, File Management Tools, Summary.

(vii) Acquiring The Skills to Manage Application with Database with java and kotlin:

Introducing Android Databases, Introducing SQLite Databases, Introducing Content Providers, Introducing SQLite, Cursors and Content Values, Working with SQLite Databases Introducing the SQLiteOpenHelper, Opening and Creating Databases without SQLiteHelper Android Database Design Considerations, Querying a Database, Extracting Results from a Cursor, Adding, Updating, and Removing Rows, Inserting New Rows, Updating a Row, Deleting Rows, Saving Your To-Do List, Creating a New Content Provider, Exposing Access to the Data Source, Registering Your Provider.

(viii) Projects Discussion and uploading app:

Phone calling.

Notification app, Messaging.

Integration of youtube.

Student registration system.

Upload app on playstore.

Recommended Hardware:

- Desktop/Laptop
- 8 GB RAM or more
- 8 GB of available disk space minimum (IDE + Android SDK + Android Emulator)
- x86_64 CPU architecture; 2nd generation Intel Core or newer, or AMD CPU with support for a Windows Hypervisor

Recommended Software:

- Text Editor: Visual Studio code/Notepad++
- Android Studio

Reference Books:

- Android Programming with Kotlin for Beginners by John Horton
- Head First Android Development: A Brain-Friendly Guide
- Android App Development for Dummies, Michael Burton
- Fundamentals of Android App Development, Sujit Kumar Mishra
- Android Programming: The Big Nerd Ranch Guide, Kristin Marsicano, Chris Stewart.

LIST OF EQUIPMENT (For a batch of 20 students)

Description		Qty	Specifications
1	Classroom	1	30 Sq.m
2	Student Chair	20	
3	Student Table	20	
4	LCD Projector	1	
5	Trainer Chair & Table	1	
6	Pin up Boards	1	
7	White Board	1	
8	Desktop/Laptop	20	<ul style="list-style-type: none"> ● x86_64 CPU architecture; 2nd generation Intel Core or newer, or AMD CPU with support for a Windows Hypervisor ● 8 GB RAM or more ● 8 GB of available disk space minimum (IDE + Android SDK + Android Emulator)

TRAINER PROFILE

Level: 4

Batch Size: 20 students

No of Trainers: 1

No of demonstrators: 1

Education Qualification	<ul style="list-style-type: none">● B.E./B. Tech (CSE/IT) or MCA or IT(DOEACC)-B Level
Experience	<ul style="list-style-type: none">● Minimum 1 year of experience in the field of Android App Development
Technical Skills	<ul style="list-style-type: none">● Hands-on Experience in Java● Expertise in Kotlin● Industrial level hands-on experience through various projects
Other Skills	<ul style="list-style-type: none">● Should be able to communicate well in English● Good command on regional language● Knowledge of working on computers● Should be able to prepare lesson plan, deliver the courses through the specified media as per schedule● Should be able to inspire the trainees & evaluate and assess the trainees● Should be able to monitor progress and give feedback to trainees● Should be able to maintain MIS related to training

LIST OF SOFTWARE (For a batch of 20 students)

1. Primary requirement	
Operating system	For all computers
Web browser	
Antivirus	
Internet connectivity	

From the following software one from each group need to be installed in minimum 10 work stations. Original licenses need to be obtained wherever necessary. Open-source software's are allowed.

2. Software for Documentation, Calculation & Presentation	
Proprietary Software	MS Office
Open Software	Libre Office

3. Software for Android App Development	
Open Software/Proprietary Software(as applicable)	<ul style="list-style-type: none"> ✓ Android Studio. ✓ Android Debug Bridge (ADB) ✓ Android Virtual Device (AVD) Manager ✓ Eclipse ✓ IntelliJ IDEA ✓ Fabric