

Information Booklet cum Syllabus

Of

Mobile Application Development using Android Programming Revision-I



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National Institute of Electronics and Information Technology

An Autonomous Scientific Society under
Ministry of Electronics and Information Technology, Government of India

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1. About Course

This Course has been prepared for the beginners to help them understand basic Android programming. After completing this tutorial you will find yourself at a moderate level of expertise in Android programming from where you can take yourself to next levels.

2. NIELIT

National Institute of Electronics and Information Technology, NIELIT, (Erstwhile DOEACC Society) is an autonomous scientific society of the Ministry of Electronics & Information Technology, Government of India. The Society is registered under the Societies Registration Act, 1860. NIELIT was set up to carry out Human Resource Development and related activities in the area of Information, Electronics & Communications Technology (IECT). NIELIT is engaged both in Formal & Non-Formal Education in the areas of IECT besides development of industry oriented quality education and training programmes in the state-of-the-art areas. NIELIT has endeavored to establish standards to be the country's premier institution for Examination and Certification in the field of IECT. It is also one of the National Examination Body, which accredits institutes/organizations for conducting courses in IT and Electronics in the non-formal sector.

Minister for Electronics & Information Technology, Government of India, is the Chairman of the Governing Council. The Director General is the Chief Executive Officer of the Society and manages day to day affairs of the Society. Manifold functions of the NIELIT Courses are:

- i. Accreditation
- ii. Registration
- iii. Examination
- iv. Certification

Over the last three decades, NIELIT has acquired very good expertise in IT training through its wide repertoire of courses.

3. Objective of Course

The Android is an operating system and programming platform developed by Google for mobile phones and other mobile devices, such as tablets. This is a practical oriented course which provides participants with the information and lab experience necessary to develop and deploy Android applications. **This course covers core java** and basic Android application Development. It provides theoretical background as well as in-depth knowledge of app development related environment and packages.

After completing the module, the learner will be able to understand the concept java, xml, SQLite ,APK,AAPT, Firebase & Android Studio which help to develop Android Mobile Application.

4. Job Roles of Course

This Course is designed to equip a learner with necessary skills as per following job roles:

- In today's world, everything is shifted online and also most people will more user-friendly with Mobile as compared to desktop and PC. so out of the 2.5 billion's people are Android device user's so due to this the demand, Android Developer's increased rapidly. Thus, Android developers have great Job Scope in the Industry. In India, **nearly 67 % out of 100% of mobile Developers are Android developers**, the rest 21% Developers are iOS Developer's, 10 % both Android and iOS, and the remaining developers are Window's App Developer's. As the percent of Android developers are more it means it is the most demanding skill in India

5. Eligibility

12th Class , Basic Knowledge of Computer & java programing.

6. Total duration of the Course

Duration of the Course is 90 hours (30 hours of Theory and 60 hours of Practical/Tutorials)

7. Practical/Tutorial

The students have to devote 66% Practical of the total time allotted to unit of the course for the practical/tutorial sessions.

8. Course Details

8.1.Course Outline and Objective of Each Unit

S. N.	Unit Name	Durati on (Theor y) in Hours	Duratio n (Practic al) in Hours	Total Lear ning Hrs.	Learning Objectives
1	Detailed Introduction & History About Android & Java Configuration	7	15	22	After completion of this module, learner will be able to understand <ul style="list-style-type: none"> • About Android App Development • Scope of Android App • History of Android. • Roll of Java in Android app development

					<ul style="list-style-type: none"> • Configure Java Path • Knowledge of different types of java Editors • Build java program • Detailed Description about Necessary Tools of java Programming for Android app Development
2	Kotlin Introduction & Details of Kotlin Programing	7	15	22	<p>After completing this module the participant will be able to:</p> <ul style="list-style-type: none"> • Know the Role of kotlin language in mobile app • Create Calculator app using kotlin • Understand the Architecture of kotlin • Kotlin Instalation • Understand the kotlin expression
3	App development using Android Studio & other IDE	8	15	23	<p>After completion of this unit of module, the Learner will be able to</p> <ul style="list-style-type: none"> • Handle the life cycle of Android activity • Apply user Interface Widgets on screen • Knowledge of different types of layouts and there implementation • Knowledge of android XML file
4	Firestore and SQLite Database Connectivity and Process of Uploading APK File on Google Play Store.	8	15	23	<p>After completion of this unit of module, the Learner will be able to –</p> <ul style="list-style-type: none"> • Understand Dynamic Approach of Android app

				<ul style="list-style-type: none"> • Connect Android app with real Time database server • Understand of different type of Query Command Like DDL DML DCL & DTL. • Create APK file and Upload APK file on Google Play store.
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8.2. Detailed Syllabus

Unit Name	Contents	Hrs.
Detailed Introduction & History About Android & Java Configuration	<ul style="list-style-type: none"> • Android Introduction, Android Studio Description, Types of file can be used in android studio, History of Android, Android, Versions of android. • Java Introduction, Features of java, Configuration of java , Compare with other language , First program of java. • Java Variable, Java Data type, Java Operators, Java Keywords , Java Control Statements, java if statement , java if-else statement ,java if-else-if ladder statement, nested if-else statement , java switch case. • Java For Loop , Java While Loop, Java Do while Loop, Break statement, Continue statement, Java Array. • Java OOPs Concept 	20
Kotlin Introduction & Details of Kotlin Programing	<ul style="list-style-type: none"> • Introduction of Kotlin, Difference between java and kotlin, Role of kotlin in Mobile app development. 	20

	<ul style="list-style-type: none"> • Kotlin first program, keywords of kotlin ,library of kotlin, kotlin variable & Data Type. • Kotlin utility function, regular expression ,Alert dialog box using kotlin • Kotlin packaging 	
App development using Android Studio IDE & other IDE	<ul style="list-style-type: none"> • About Android Manifest file, Android Activity Lifecycle, onCreate(), onStart(), onResume(), onPause(), onStop(), onRestart(), onDestroy(), Intent, Intent Filter. • About Layouts ,Constraint Layout, Relative Layout, Linear layout, Tab Layout, GridView. • Android UI Widgets , Properties of UI ,Working With Textview ,Working With Button, Working with Toast ,Working with Check Box, Working With Radio Button, Working With spinner. • Alert Dialog Box, Web View, Progress bar, Image Slider, Search View 	20
Dynamic Approach using Firebase & SQLite Database Connectivity and Process of Uploading APK File on Google Play Store.	<ul style="list-style-type: none"> • About Dynamic App, About SQLite Database , execSQL(), Update(), query(). • Firebase console . • Firebase Authentication • Create Database on firebase • Create table on firebase • Connection with firebase • SQLite Database Connectivity • DDL • DML • DCL • DQL • DTL • Upload Apk File On Google Play store 	

9. Reference Books/Study Material

1. Android Developer Tutorial
2. Java point
3. Stack Overflow
4. Java Black Book
5. aGeeks4geeks

10. Practical Assignments

Assignment 1:

- Download and Install Latest Java version on your PC / Laptop.
- Write a Java program to print 'Hello' on screen and then print your name on a separate line:-
- Expected Output :
Hello
Sandeep Pandey

Assignment 2:

- Write a Java program to get a number from the user and print whether it is positive or negative.

Assignment 3:

- Make Simple App and Install in your phone

Assignment 4:

- Write a Java program to sum values of an array
- Write a Java program to calculate the average value of array elements.

Assignment 5:

- Write a Java program to sum values of an array
- Write a Java program to calculate the average value of array elements.

Assignment 6:

- Create a class named 'Student' with String variable 'name' and integer variable 'roll_no'. Assign the value of roll_no as '2' and that of name as "John" by creating an object of the class Student

Assignment 7:

Write a java program that perform following task-

- Create a package named calpack.
- In the calpack package declare math1 and area1 class.
- In the the math1 class define a method named sum(int a , int b) this function will take two integer values and return the sum of integer values
- In the area1 class define two methods rectarea and squarearea that will calculate and return the area of rectangle and square
- Create another program named testcalpack in the current package and call sum(.....)function which is defined in math1 class and call squarearea and rectarea function which is defined in the area1 class

Assignment 8:

- Download and Install IntelliJ IDE in your PC / Laptop, Explain about key feature of kotlin

Assignment 9:

- Write a program in kotlin to accept and display the following details of a students- Name, Age, Marks
- Ph_no, Class, Address
- Use all data types
- available in kotlin.

Assignment 10:

- Send Data From One Activity to Another Activity

Assignment 11:

- Create following table and perform required task.

Table:-Customer

- Column-cid, cname, address, mobno, salary , gender, email
- Task--Insert at least 10 records
- Display all the records of the table in bank database
- Display the record of customer whose cid is 5
- Change the address of customer whose cid is 7
- Change the mobile no of employee named 'john'
- Delete all customer whose salaries are equal to Rs.7000
- Delete table

Assignment 12:

- Download and Install Android Studio

Assignment 13:

- Create a simple app and apply background images and color on a activity.

Assignment 14:

- Create a simple app which contain 5 activity and display last one only.

Assignment 15:

- Create Student registration form app , When submit the form then data should be save on Firebase Database.
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11) Sample Questions

1. _____ is used to find and fix bugs in the Java Programs.
 - A. JVM
 - B. JRE
 - C. JDK
 - D. JDB

 2. What is the extension of java class file ?
 - A. .java
 - B. .class
 - C. .jdk
 - D. .jre

 3. An interface with no fields or methods is known as a _____.
 - A. Runnable Interface
 - B. Marker Interface
 - C. Abstract Interface
 - D. CharSequence Interface

 4. Which file extension is used to save Kotlin files.
 - A. .Java
 - B. .kot
 - C. .kt or .kts
 - D. .andriod

 5. All classes in Kotlin classes are by default?
 - A. Public
 - B. Final
 - C. Sealed
 - D. Abstract

 6. What is an activity in Android?
 - A. Activity performs the actions on the screen
 - B. Manage the Application content
 - C. Screen UI
 - D. None of the above
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7. What are the layouts available in android?

- E. Linear Layout
- F. Frame Layout
- G. Table Layout
- H. Relative Layout
- I. All of above

8. How many orientations does android support?

- A. 4
- B. 10
- C. 2
- D. None of the above

9. What is the system image that the virtual device was set up to support?

- A. Marshmallow
- B. JellyBean
- C. KitKat
- D. Ice-cream sandwich

10. Which is the correct line of code to get the ID of the EditText you intend to use?

- A. `EditText = (EditText)findViewById(R.id.nameTextField);`
- B. `EditText TextHandler = (EditText)findViewById(R.id.nameTextField);`
- C. `EditText TextHandler = (EditText)findViewById(nameTextField);`
- D. `EditText TextHandler = findViewById(R.id.nameTextField);`