Specialised Programme on Mobile App Development – 2 Weeks

Pre-requisites for the course
- Knowledge of Java programming language

Aim
- ➢ This program offers opportunity to learn Android App Development. Here, we can design native applications, which are specific to Android-OS devices like Mobiles, Tablets etc. This course will help participants to create richly featured and adaptable mobile applications solutions for real time problems.

Objectives
- ➢ Learn the basics of Mobile platform and its applications
- ➢ To develop, implement and deploy techniques in App development for Android platform
- ➢ Learn to add features in Apps based on Firebase Cloud Messaging, Data Storage
- ➢ Participants can engage with dynamic and segmented app features and notifications
- ➢ Build, launch and maintain native mobile apps

Course Contents

Introduction of Mobile App Development
Introduction of Mobile platforms for App Development
Introduction to Android Operating System
- History
- Various versions of Android
- Why develop for Android?

Setting up Android App development Environment.
- Downloading JDK and Android studio
- Installing and configuring Android Studio
- The Developer workflow
- Hello World! – Android

Understanding an Android Studio Project.
- Various folders in Android studio project
- Intro to Android Manifest.xml
- Intro to res folder
- What is Gradle?
- Various aspects of build.gradle file

Understanding the Android Architecture
- Android layered Architecture
- The Kernel Layer
- The Android Runtime, and Libraries
- The Application Framework

Dalvik VM vs ART
- What is DVM?
- The .dex format

Introduction to Fundamental Components of Android OS
- Activity
- Service
- Content Provider
- Broadcast Receiver

Activity
- What is an Activity?
- Activity Life Cycle
- Various states and lifetimes of an Activity
- Starting an Activity
- Starting an Activity for result

Intent
- What is an Intent?
- Various uses of Intent
- Intent: An IPC mechanism
- Types of Intent
- Implicit intent
- Explicit intent

Intent Filter
- Intent filter options - action, data, category

Context
- What is Context?
- Various uses of context
- Data sharing using Intent
- Sharing objects using Intents

Android UI Design
- What is a View, View Group and Layout?
- Android View System

Android Layouts
- Linear layout
- Relative layout
- Frame layout
- Constrained layout
- Various View attributes
- Button, TextView and EditText
- Various UI Events and Event listeners
- ScrollView
- Spinner
- Checkbox
- Radio Button
- Date and Time Pickers
- Switch and Toggle
- ImageView

Menus and Pop ups
- Contextual Action Modes
- Pop up Menu

Fragment
- What is a Fragment?
- Creating a Fragment
- Fragment Life Cycle
- Communication between Fragment and Activity
- Fragment Transactions: Add, Replace, and Remove fragments
- Master Detail View using Fragments

- Types of Fragments
- Dialog Fragment
- List fragment

Introduction to Material Design
- What is Material Design?
- Adding material design support to your App
- Material design colour scheme and Themes

Introduction to RecyclerView
- ListView vs RecyclerView: Advantages of RecyclerView
- Implementing RecyclerView.Adapter class
- Implementing RecyclerView. ViewHolder class
- Handling click events in RecyclerView
- Floating Action Button
- SnackBar

Services in Android
- What is a Service?
- Types of Service - Started Service, Bounded Service
- Service Life cycle
- Starting a service
- IPC between Service and Activity using Binder
- Intent Service
- Broadcast Receiver
- Handle custom app based event
- Handle system event

Android Storage
- Storing data in Shared Preferences
- Storing organized Data into SQLite DB
- Content Values and Cursors
- CRUD operations on SQLite DB
- Searching from table in SQLite DB

Push Notifications
- Notification
- Push Notifications from Firebase
- Sending push notifications from custom server