Marwadi University
Faculty of Diploma Studies
Information and Communication Technology

Subject Code: 09CT0509

Subject Name: Programming with Application Development (Android)

Diploma Year – III (Semester V)

Objective:
This course facilitates classroom and laboratory learning, letting students learn kotlin programming language and develop competence and confidence in android app development. Students will understand the Android Platform and apply advanced features, Sensors, APIs so the students can independently create and deploy Android Applications with SQLite.

Credits Earned: 05 Credits

Course Outcomes: After completion of this course, student will be able to:

1. Illustrate and explain basic concepts of Kotlin programming. (Understand)
2. Understand the architecture and user interface of android. (Understand)
3. Select appropriate controls and layouts based on problem definition. (Analyze)
4. Understand the real-life situation and solve it using advanced features, APIs and sensors available in android with SQLite database. (Apply)
5. Build, publish and monetize the Android apps using Kotlin programming. (Create)

Pre-requisite of course: Basics of programming language, Concepts of OOP

Teaching and Examination Scheme:

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
4	0	2	5	50	30	20	25	25	150

Contents:

Unit	Topics	Contact Hours
1	**Introduction to KOTLIN Programming:** • Basics of Kotlin, Operations and Priorities, Decision Making • Loop Control, Data Structures (Collections), Functions • Object-Oriented Programming: Inheritance, abstract, interface, super and this, visibility modifiers.	06
2	**Introduction to Android and User Interface:** • ANDROID SDK Features, Introduction to Development Features • Developing for ANDROID, developing for mobile and embedded devices, ANDROID development tools • Basics of an ANDROID application, introduction to manifest, externalizing resources, application lifecycle, ANDROID activities • Widgets: Button, TextView, ImageView, ProgressBar, ListView, EditText, Calendar, DateTime etc • Working with Intent	10
3	**Android Storage: Files, Shared Preferences, SQLite Database** • Creating, saving and retrieving shared preferences • Including static files as resources, working with the file system • Introducing ANDROID databases • Content values and cursors • Working with SQLite databases • Creating content providers • Using content providers • Native ANDROID Content providers	10
4	**Enhancing User Experience, Maps & Location Based Service, Sensors** • Material design, RecyclerView, CardView, TabLayout, ViewPager • Menus and dialogs, drawable and gradients • Using location-based services • Selecting a location provider • Finding your current location • Creating map-based activities • Hardware sensors, Sensors and sensor manager, monitoring devices movement and orientation	12

5	**Audio, Video, Camera, Bluetooth, Wifi:** • Playing audio and video manipulating raw audio, using camera to take pictures, recording video, adding media to mediastore. • Managing Bluetooth • Monitor and manage Wifi	06
6	**Telephony API, Publishing, Monetizing & Distributing the Android Application:** • Hardware support for telephony, using telephony • introducing SMS Send & Receive, • Signing, publishing, monetizing & distributing applications.	10
7	**Introduction of other mobile application development technology/framework:** • iOS Development Framework • Flutter	02
	Total Hours	56

Suggested Text books / Reference books:

1. Kotlin for Android App Development, Peter Sommerhoff, Addison-Wesley
2. Pro Android with Kotlin - Developing Modern Mobile Apps, Peter Spath, Apress

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	25%	25%	20%	10%	15%

Suggested List of Experiments:

1. Object-oriented concepts-based program in Kotlin
2. Introduction to android operating system and study of basic widgets.
3. Study of android lifecycle and demonstration of it.
4. Study of list views and adapters
5. Study of dialog interfaces in android
6. Study of intents and types of intents
7. Study of android database (SQLite)
8. Study of material design
9. Study of map and location-based activities
10. Study of Sensors in android
11. Study of audio, video and camera services in android
12. Study of Bluetooth and Wi-Fi in android
13. Study of telephony API in android
14. Publishing android app on Playstore and monetization

Supplementary Resources:

1. https://developer.android.com/index.html
2. https://developer.android.com/kotlin
3. https://www.coursera.org/learn/kotlin-for-java-developers
4. https://swayam.gov.in/nd2_aic20_sp02
5. https://flutter.dev/
6. https://developer.apple.com/develop/