

## ELECTIVE 10: KOTLIN PROGRAMMING

### COURSE DESCRIPTION

This course introduces Kotlin programming. The students assess Kotlin's development environment, its data structures, operators, control statements, Object-oriented concepts, layouts, events, menus, navigation, intents, broadcasts, threads, SQLite, media frameworks, maps and fingerprint authentications to get an in-depth understanding of Kotlin programming.

### COURSE LEARNING OUTCOMES

Learning Outcomes		Cognitive Level
CLO1	Understand the fundamentals of Kotlin	Understand
CLO2	Understand the variables, operators, control flow, and lambda	Understand
CLO3	Apply Object Oriented capabilities of Kotlin	Apply
CLO4	Analyze the UI components in Kotlin	Analyze
CLO5	Design solutions based on advanced features in Kotlin	Create

### Mapping of course outcomes with programme outcomes - Low=1, medium=2, High=3

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1	1		1	1				
CLO2	1	1	2	2	1			
CLO3	2	2	2	2	1			
CLO4	3	3	3	3	3			1
CLO5	3	3	3	3	3			1

### Module I

Kotlin: - Introduction, Advantages & Disadvantages, Kotlin for Android, Kotlin for Server Side Development. Setting up Kotlin Environment (Android). Environment Familiarization: - User Interfaces, AVD, Emulator, Testing, Android Studio Code Editor. Android Architecture: Stack, Kernel, Runtime, Libraries.

### Module II

Activities, Intents, Broadcast (Intents & Receivers), Service, Content Providers, Manifest, Resource, Gradle, Resource & Context. Kotlin: - Kotlin & Java, Java to Kotlin, Kotlin & Android Studio, Semi-Colon in Kotlin. Kotlin Datatypes , Kotlin Variables ( Mutable &

Immutable), Variable Declaration, Type Annotation & Inference, Nullable, Safe Call Operator, Not Null Assertion , Nullable Type and let Function, Elvis Operator, Type Casting & Checking. Operators & Expression: - Expression, Assignment, Arithmetic, Augmented Assignment, Increment &Decrement, Equality, Boolean Logical, Range & Bitwise. Flow Control: - for – in, while, do – while, Break & Continue, Break & Continue Labels, if, if – else, if – else – if, when. Functions & Lambda: - Type, Return Values, Parameters, Variable Number, Lambda, Higher Order.

### **Module III**

Basics Of OOP's, Inheritance & Sub classing, Activity Life Cycles, Activity State Changes, Save & Restore State, Views, View Groups & Layouts, Layout Editor, Constraint Layout, Constraint Layout Chain, Ratios, Constraint Set, Android Event Handling, Multi Touch Event Handling, Gesture Detector, Custom Gesture, Fragments, Menus & Overflow Menus, Animation & Transitions, Floating Action Button & Snackbar, Tab Layout, RecyclerView & Card View, App Bar, Collapsing Toolbar, Navigation Drawer.

### **Module IV**

Master – Details Flow, Android Intents , Broadcast Intent & Receivers, Thread & Async Task, Started & Bound Service, Remote Bound Service, Notification , Multi Windows Support, Split Screen & Freeform, SQLite, Table Layout, Table Row, Content Providers, Cloud Storage & Access Framework, Video View, Media Controller, Picture in Picture, Video Recording & Image Capture, Runtime Permission Requests.

### **Module V**

Google Maps API, Android Printing Framework, Custom Document Printing, Android App Links, Instant Apps, Android Studio Profiler, Android Fingerprint Authentication, Handling Different Devices & Displays, Signing Android App for Release, Gradle in Android Studio.

### **REFERENCES**

1. *Antonio Leiva* , Kotlin for Android Developers: Learn Kotlin while developing an Android App, *CreateSpace Independent Publishing*, 2016, ISBN-13:978-1530075614
2. *Marcin Moskala, Igor Wojda* , Android Development with Kotlin, *Packt Publishing*, 2017, ISBN-13:978-1787123687
3. *Dmitry Jemerov, Svetlana Isakova*, Kotlin in Action, *Manning Publications*, 2017, ISBN- 13:978-1617293290
4. *Stephen Samuel, Stefan Bocutiu* , Programming Kotlin, *Packt Publishing Limited*, 2017, ISBN-13:978-1787126367
5. *Milos Vasic*, Mastering Android Development with Kotlin, *Packt Publishing Limited*, 2017, ISBN-13:978-1788473