TRAINING CONTENTS

Module	Session No.	Topics	No. of class hours
Basics of Kotlin for Android	1	**Lecture:** ● Variables, data types, and operators ● Control flow (if, when, loops) ● Functions and lambdas ● Collections and iterators **Practical:** ● Write Kotlin programs demonstrating basic syntax ● Create simple functions and use control flow statements ● Implement functions and lambdas in Kotlin ● Work with lists, sets, and maps	3
	2	**Lecture:** ● Object-oriented programming in Kotlin ● Classes, objects, and interfaces ● Extension functions and higher-order functions **Practical:** ● Create classes and interfaces in Kotlin ● Use extension functions ● Implement higher-order functions	3
	3	**Lecture:** ● Overview of Android OS ● Setting up Android Studio and the development environment **Practical:** ● Install Android Studio and set up the Android SDK ● Create a "Hello World" project in Kotlin	3
	4	**Lecture:** ● Anatomy of an Android project (folders and files) ● Gradle build system and configurations ● Manifest file and its importance **Practical:** ● Explore the structure of a new Android project ● Modify the build. gradle file to add dependencies ● Edit the AndroidManifest.xml for basic configurations	3
XML-Based UI	5	**Lecture:** ● XML syntax and structure for layouts	3

Development		● Types of layout files ● Best practices for XML layouts **Practical:** ● Create basic XML layout files ● Design simple user interfaces using XML ● Use Android Studio’s layout editor	
	6	**Lecture:** ● Introduction to View and ViewGroup ● Common ViewGroup subclasses ● Nesting ViewGroups and hierarchy **Practical:** ● Create and arrange Views in different ViewGroups ● Experiment with ViewGroup attributes and properties ● Implement a nested layout structure	3
	7	**Lecture:** ● Overview of basic UI components ● Properties and attributes of TextView, Button, and ImageView ● Handling clicks and user interactions **Practical:** ● Add and customize TextView, Button, and ImageView in XML ● Implement click listeners and other event handlers ● Create a simple interactive UI	3
	8	**Lecture:** ● Characteristics and use cases of each layout manager ● Constraints and positioning in ConstraintLayout ● Performance considerations **Practical:** ● Design UIs using LinearLayout, RelativeLayout, and ConstraintLayout ● Utilize constraints and chains in ConstraintLayout ● Compare and optimize layout performance	3

Introduction to Jetpack Compose	9	**Lecture:** ● Introduction to declarative UI paradigm ● Benefits of Jetpack Compose ● Compose architecture and components **Practical:** ● Set up a new Compose project ● Create basic composables ● Compare Compose with XML-based UI	3
	10	**Lecture:** ● Adding compose dependencies ● Configuring project for Compose ● Compose UI toolkit overview **Practical:** ● Add Compose dependencies to an existing project ● Configure Android Studio for Compose ● Run and debug a Compose application	3
	11	**Lecture:** ● Overview of basic Compose components ● Component properties and customization ● Handling user interactions in Compose **Practical:** ● Implement Text, Button, and Image composables ● Customize components using modifiers ● Handle click events in Compose	3
	12	**Lecture:** ● Composable layout components ● Arranging Elements in Columns, Rows, and Boxes ● Alignment and spacing in Compose **Practical:** ● Create layouts using Column, Row, and Box ● Experiment with alignment and spacing ● Build a responsive Compose layout	3
Integrating XML and Compose	13	**Lecture:** ● Benefits and use cases of hybrid UI ● Adding Compose to existing XML projects ● Handling interoperability	3

		Practical: - Add Compose UI to an existing XML-based project - Implement a hybrid UI using XML and Compose - Manage communication between XML and compose components	
	14	**Lecture:** - Interoperability between XML and Compose - ComposeView and AndroidView - Best practices for combining XML and Compose - Handling lifecycle and state across UI frameworks **Practical:** - Use ComposeView to integrate Compose in XML layouts - Use AndroidView to embed XML layouts in Compose - Synchronize state and lifecycle between XML and Compose	3
Integrating XML and Compose	15	**Lecture:** - Planning a migration from XML to Compose - Step-by-step migration process - Addressing common challenges **Practical:** - Migrate a simple XML-based UI to Compose - Identify and solve migration issues - Optimize the migrated Compose UI	3
Data Handling and Persistence	16	**Lecture:** - MVVM architecture overview - ViewModel and LiveData components - Benefits of using ViewModel and LiveData **Practical:** - Implement ViewModel and LiveData in an app - Observe LiveData in UI components - Manage UI state with ViewModel and LiveData	3

	17	**Lecture:** • Overview of Room Library • Setting up Room database • Defining entities and DAOs **Practical:** • Set up Room in an Android project • Create entities and DAOs • Performing CRUD operations with Room	3
	18	**Lecture:** • Introduction to RESTful APIs • Overview of Retrofit Library • Making network requests with Retrofit **Practical:** • Set up Retrofit in an Android project • Perform GET and POST requests • Parse and display JSON data	3
	19	**Lecture:** • Data binding in XML • State management in Compose • Synchronizing data between Compose and XML **Practical:** • Implement data binding in an XML-based project • Manage state in a Compose project • Integrate data handling across XML and Compose components	3
Advanced Topics for Android	20	**Lecture:** • Animation APIs in XML • Animation APIs in Compose • Best practices for animations **Practical:** • Implemented animations using XML properties • Create animations in Compose • Compare and optimize animation performance	3
	21	**Lecture:** • Identifying performance bottlenecks • Profiling tools in Android Studio • Optimization techniques for UI and data **Practical:** • Profile an Android app • Optimize UI rendering performance • Implement best practices for performance	3
	22	**Lecture:** • Introduction to Espresso for UI testing • Testing Compose UI	3

		• Writing effective UI tests **Practical:** • Set up Espresso for testing XML-based UIs • Write and run Compose UI tests • Analyze and fix test failures	
	23	**Lecture:** • Importance of accessibility • Accessibility features in Android • Best practices for accessible UI design **Practical:** • Implement accessibility features in an app • Test app accessibility • Ensure compliance with accessibility guidelines	3
Project and Capstone	24	**Lecture:** • Project Planning and Requirements • Defining project scope and requirements • Planning development stages • Setting milestones and deadlines **Practical:** • Create a detailed project plan • Define functional and non-functional requirements • Prepare a development timeline with milestones	3
	25	**Lecture:** • Developing a Complete App with XML • Integrating all XML-based UI concepts • Best practices for app development • Debugging and testing the app **Practical:** • Develop a complete app using XML layouts • Implement data handling and persistence using Room and ViewModel • Test and debug the app	3

	26	**Lecture:** ● Developing a Complete App with Compose ● Integrating all Compose-based UI concepts ● Best practices for Compose development ● Debugging and testing the app **Practical:** ● Develop a complete app using Jetpack Compose ● Implement data handling and persistence using Room and ViewModel ● Test and debug the app	3
	27	**Lecture:** ● Hybrid App Using XML and Compose Android OS architecture and components ● Combining XML and Compose in a single project ● Strategies for seamless integration ● Preparing for final project presentation **Practical:** ● Develop a hybrid app using both XML and Compose ● Implement advanced features and optimizations ● Prepare and deliver a final project presentation	3
Total Sessions	27	**Total class hours**	81 hours
Mentorship Sessions	28	**CV Writing:** Crafting an effective CV, structuring for impact, tailoring CVs for job roles, common mistakes, and ATS optimization	3
	29	**Job Interview:** Resume-based and behavioral interviews, common interview questions, STAR method, body language, and mock interview practice	4
	30	**Industrial Life:** Workplace culture, professional ethics, career growth, communication skills, handling work pressure, and networking strategies	3

Total Mentorship Sessions	3	**Total mentorship class hours**	10