

Name of the Course: Mobile Application Development

Sr. No.	Heading	Particulars
1	Description the course:	<p>Introduction:</p> <p>Mobile devices are ubiquitous in modern life, and with them comes the need for innovative and functional mobile applications. This course introduces students to the world of Android app development using Kotlin, the officially recommended programming language by Google. Learners get hands-on exposure to building real-time applications using Android Studio, enabling them to create robust, secure, and user-friendly mobile applications.</p> <p>Relevance:</p> <p>This course bridges academic programming knowledge with practical industry skills. In a world where mobile-first solutions dominate, Android development is one of the most sought-after technical skills, with Kotlin leading the trend due to its expressive syntax and reliability.</p> <p>Usefulness:</p> <p>This course provides hands-on experience with real-time Android app development using Kotlin, helping students bridge theoretical knowledge and practical application. Learners gain exposure to essential skills like UI design, database integration, and deployment practices, which are critical in the modern software development cycle.</p> <p>Application:</p> <p>Students can build interactive apps for domains like education, health, business, and entertainment. Through the use of features like Firebase, media handling, and location services, learners can design complete, data-driven mobile solutions suitable for real-world implementation.</p> <p>Interest:</p> <p>The course is engaging due to its visual and interactive nature — students see their code come to life in the form of functioning apps. Working with media, animations, sensors, and camera access makes the learning process exciting and creatively fulfilling.</p> <p>Connection with Other Courses:</p> <p>This course builds directly on programming concepts</p>

		<p>taught in Object-Oriented Programming and integrates well with Database Management Systems through SQLite and Firebase. It also relates to Software Engineering principles for structured app development and UI/UX Design for front-end aesthetics.</p> <p>Demand in the Industry:</p> <p>Android dominates the global mobile market, making Android app development a high-demand skill. With Google's backing of Kotlin, there is a rising need for developers proficient in this language, especially in the mobile-first product ecosystem.</p> <p>Job Prospects:</p> <p>Successful completion opens doors to roles like Android Developer, Mobile App Engineer, UI/UX Developer, and Firebase Backend Integrator. Students can also work as freelancers, contribute to startups, or launch their own apps on the Google Play Store.</p>
2	Vertical:	SEC
3	Type:	Practical
4	Credits:	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	Hours Allotted:	60 Hours
6	Marks Allotted:	50 Marks
7	<p>Course Objectives (CO):</p> <p>CO 1. Understand the fundamentals of mobile app development using Kotlin and Android Studio.</p> <p>CO 2. Design and build interactive and responsive user interfaces for Android devices.</p> <p>CO 3. Utilize core Android components such as Activities, Intents, and Fragments.</p> <p>CO 4. Store, retrieve, and manipulate data using SQLite and Firebase Realtime Database.</p> <p>CO 5. Implement multimedia, location-based, and background services in Android apps.</p> <p>CO 6. Deploy and publish Android apps with proper versioning and signing protocols.</p> <p>CO 7.</p>	
8	<p>Course Outcomes (OC):</p> <p>After successful completion of this course, students would be able to -</p> <p>OC 1. Set up Android Studio and develop basic Kotlin applications with UI interaction.</p> <p>OC 2. Apply object-oriented programming concepts using Kotlin for mobile application logic.</p>	

	<p>OC 3. Use core Android components to develop modular and multi-screen applications.</p> <p>OC 4. Create dynamic UIs using layouts, fragments, menus, and handle user interactions efficiently.</p> <p>OC 5. Store and retrieve data using local databases and cloud services like Firebase.</p> <p>OC 6. Integrate media, camera, GPS, and background services into functional applications.</p> <p>OC 7. Package, sign, and deploy Android applications to the Google Play Store.</p>
9	<p>Modules:-</p> <p>Module 1 (30 hours):</p> <p>Getting Started with Android Studio & Kotlin: Setting up Android Studio, AVD, and first Kotlin-based app, Kotlin basics: variables, data types, type conversion, operators, Simple user input/output using TextView, EditText, Button</p> <p>Kotlin Control Flow & OOP Basics in Action: Control statements: if, when, loops, Functions, default arguments, extension functions, OOP concepts: classes, objects, inheritance, companion object</p> <p>Android Core Components: Activities, Intents (explicit/implicit), Activity lifecycle: demo with logs and state changes, Fragments: modular UI creation, Toasts, Dialogs, and simple navigation</p> <p>Layout Design & UI Interactions: Layouts: Linear, Relative, ConstraintLayout, Views and UI Controls: TextView, EditText, Button, ImageView. Event handling: onClickListener, simple data validation, Styling UI: themes, styles, and manifest configuration</p> <p>Module 2 (30 hours):</p> <p>Working with Lists & Menus: ListView, RecyclerView, Adapter usage, Menus: options, context, and popup menus, Fragments with RecyclerView navigation</p> <p>Data Persistence & Firebase Integration: SharedPreferences, SQLite basics and CRUD operations, Firebase Realtime Database: read/write, rules, testing, Dynamic UI based on data</p> <p>Multimedia, Animations & Camera Access: Using ImageView, switching images, Playing audio using MediaPlayer, Simple animations with XML, Accessing device camera (capture & display)</p> <p>Location, Background Tasks & App Deployment: Accessing location (GPS), Background tasks using JobScheduler, App signing and versioning, Deploying to Google Play (demo or mock submission)</p>
10	<p>Text Books</p> <ol style="list-style-type: none"> 1. How to Build Android Apps with Kotlin: A hands-on guide to developing, testing, and publishing your first apps with Android, Alex Forrester, Packt Publishing, 2021 2. Android Programming: Crafting UI/UX using Kotlin, SYBGEN Learning, 2020

11	Reference Books <ol style="list-style-type: none"> 1. Head First Android Development: A Learner's Guide to Building Android Apps with Kotlin Dawn Griffiths, 3rd Edition, O'Reilly Media, 2021 2. Android Studio 4.2 Development Essentials - Kotlin Edition: Developing Android Apps Using Android Studio 4.2, Kotlin and Android Jetpack, Neil Smyth, Payload Media, 2021 3. Android Programming with Kotlin for Beginners, John Horton, Packt Publishing, 2019
12	Internal Continuous Assessment: 40% Semester End Examination: 60%