Syllabus

Programme Name	B. Tech. (CSE)		**APPLIED**	**Batch**	2023-2027
Course Code	CSE503	**Course Name**	Introduction to Android Application Development	**Semester**	V

Credits (Total)	**L**	**T**	**P**	**Marks (Internal/External**		**Contact Hours (per week)**	**Independent Study Hour (per week)**
2	2	0	0	30	70	2	2

Course Objective:

The objective of this course is to provide students with a comprehensive understanding of Android application development using the Kotlin programming language. Through a combination of theoretical concepts and hands-on practice, students will learn to set up the Android development environment, build user interfaces with XML and Android widgets, and implement essential Android components.

Course Alignment with UNSDG:

The Course aims to fulfill the United Nations Sustainable Development Goals SDG 4 (Quality Education)

Course outcomes:

After completion of course, the student will be able to:

CO-1	Understand the android architecture and various technologies.
CO-2	Design and implement user interfaces using XML layouts and Android UI components.
CO-3	Develop Android apps that handle data efficiently using SharedPreferences, SQLite databases.
CO-4	Apply advanced Android development concepts such as background services, fragment navigation, and MVVM architecture.
CO-5	Create a Web Application with server controls.

Teaching Pedagogy:

T1	Classroom teaching (white board), Power Point Presentations, Interactive lectures, Inquiry based teaching
T2	ABL activities, Assignments, Flip Class/ Seminars, Quiz, Oral Viva-voce examination

Assessment Tools

AT1-1	Quiz	**AT1-6**	Assignments/ Case studies
AT1-2	Activity Based Learning	**AT1-7**	Poster
AT1-3	Midterm Exams	**AT1-8**	Oral viva-voce examination
AT1-4	Flip Class/Group Discussion	**AT1-9**	Industrial Visit Report
AT1-5	Seminar Presentation		

Prerequisites: Basic understanding of programming languages and software development concepts.

Module	Descriptors/Topics	Hours	Assessment tools
I	**Introduction to Android Development and Kotlin:** Setting up the Development Environment: Installing Android Studio, configuring emulators. Introduction to Kotlin: Kotlin syntax, data types, control structures, and functions. Android Project Structure: Understanding the different files and folders in an Android project, Android Components Overview: Activities, Services, Broadcast Receivers, and Content Providers	6	Quiz Mid-term Exam Assignment
II	**User Interface (UI) Design and Layouts:** XML Layouts: Using XML to create UIs, Views and Widgets: TextViews, Buttons, EditTexts, and more. Layouts: LinearLayout, RelativeLayout, ConstraintLayout, Activity Lifecycle.	6	Mid-Term Quiz Assignment
III	**Module III: Data Storage and Networking:** Shared Preferences: Storing small amounts of data ; Database: Handling more complex data, such as storing and retrieving large datasets. Networking: Making HTTP requests and receiving responses, using libraries such as Retrofit or Volley. JSON Parsing: Converting the server's reply (JSON) into a format your app understands	6	Mid-Term Oral Viva- voce examination Seminar Presentation
IV	**Advanced Features :** RecyclerView: Displaying lists of data in an optimized way; Background Tasks: Using services and asynchronous tasks to handle background operations, Fragment Navigation: Creating dynamic, reusable components within an app; MVVM Architecture: Structuring your code for maintainability and scalability, where Model, View, and ViewModel interact	6	Quiz Assignment Industrial Visit Report Seminar Presentation
V	**Publishing and Optimization:** Optimizing Performance: Ensuring your app runs smoothly, even under pressure, Publishing the App: Preparing the app for release Handling Permissions and Security: Managing user data securely.	6	Quiz Assignment Industrial Visit Report Poster Oral Viva-voce examination
	Total Teaching Hours	30	

Additional Resources

A. Value addition to course content/ Skill enhancement content

a. https://material.io/design
b. https://developer.android.com/jetpack/compose
c. https://firebase.google.com/docs/android/setup
d. https://www.youtube.com/c/AndroidDevelopers

B. Remedial classes for slow learners: As per the AUMP SOP for Slow & Advanced Learners

Suggested reading:

1. Textbooks:

- Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. 2011, ISBN-13: 978-9332518889
- Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd 2010, ISBN-13: 978-0470565520

2. Reference books

- Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd., 2009**,** ISBN-13**:** 978-1430224198
- Barry Burd, "Android Application Development All in one for Dummies", Edition: 2nd, For Dummies (Wiley) , 2015, ISBN-13: 978-1118973806

3. Suggested e- resources (Websites/e-books)

- https://www.geeksforgeeks.org/android-tutorial/
- https://www.tutorialspoint.com/android/index.htm
- https://commonsware.com/Android/
- https://github.com/JStumpp/awesome-android

Assessment Plan:

Component of Evaluation	**Description**	**Code**	**Weightage %**
Continuous Internal Evaluation	Mid Term	CT	15%
	Home Assignment/Seminar/ Viva-Voce/Quiz	S/ HA/ V/Q	10%
Attendance	A minimum of 75% Attendance is required to be maintained by a student to be qualified for taking the End Semester examination. The dispensation of 25% includes all types of leaves. including medical leave	A	5%
End Semester Examination	End Semester Examination	ESE	70%
Total			**100%**

Abbreviations: CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, ESE: End Semester Examination; A: Attendance

Course Articulation Matrix (Mapping of COs with POs)

Course Outcomes	Correlation with POs												Correlation with PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	3	1	3				2		2	3	3		
CO2	1	2	2	2	2				2		3	3	2	3	
CO3	1	2	2	2	2				1		1	3	2	3	2
CO4	1	1	2	1	2				3		2	3			2
CO5	2	2	3	2	1				2		2	3			3

1: weakly related, 2: moderately related and 3: strongly related