

Branch Name:	IMCA
Program Code:	CS301
Course Name:	Mobile Computing-II Practical
Course Code:	1CS3010701P
Pre-requisite Course:	Knowledge of the C and C++ and Java Language Logic and Concept and database SQL concepts. Programming Skill. Basic Understanding of Mobile Applications.

Course Objectives:

1. To provide hands-on experience with advanced Android components such as Services, Broadcast Receivers, Content Providers, and Fragments.
2. To develop skills in data storage techniques, including Shared Preferences, file handling, SQLite, and Room Database.
3. To enable students to implement network-based applications using HTTP/HTTPS protocols and RESTful APIs.
4. To familiarize students with modern networking libraries such as Retrofit and Volley for efficient API integration.
5. To develop the ability to create location-based applications using GPS and Google Maps services.
6. To provide practical exposure to sensor-based applications using device sensors like accelerometers and gyroscopes.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
-	-	3	3	-	-	25	25	50

LAB/ Practical:

Note: The practical list provided is a part for reference only. The course t teacher may Change/formulate it as per his/her methodology and requirement.

Lab Practice Content

1. Create an application demonstrating Started Service and background task execution.
2. Develop an app using Bound Service for inter-component communication.
3. Implement a Broadcast Receiver for system events (e.g., battery, network change).
4. Create an app using Content Provider to share data between applications.
5. Design an application using Fragments with proper lifecycle handling.
6. Develop a multi-screen responsive UI for different device sizes.
7. Create an app to store user preferences using Shared Preferences.
8. Develop an application for internal and external file storage operations.
9. Implement CRUD operations using SQLite database (advanced queries).
10. Build an app using Room Database for structured data handling.

11. Parse and display data using JSON parsing from local/remote sources.
12. Implement XML parsing in an Android application.
13. Create an app to perform HTTP/HTTPS requests and display results.
14. Develop an application consuming RESTful Web Services.
15. Integrate public APIs (e.g., weather, news) into an app.
16. Build an app using Retrofit library for API calls.
17. Implement networking using Volley library.
18. Create an app demonstrating background processing (AsyncTask / Threads / Work Manager).
19. Develop an app to fetch current GPS location of the device.
20. Integrate Google Maps and display markers on selected locations.
21. Implement Geocoding & Reverse Geocoding.
22. Create a simple real-time location tracking application.
23. Develop an app using Accelerometer sensor (e.g., shake detection).
24. Build an application using a Gyroscope sensor for motion-based interaction.
25. Set up a Firebase project and connect it with an Android app.
26. Implement Firebase Authentication (Email/Password login).
27. Add Google Sign-In authentication using Firebase.
28. Create an app to store and retrieve data using Firebase Realtime Database / Fire store.
29. Implement Firebase Cloud Messaging (Push Notifications).
30. Develop a cloud-based app combining authentication + database.
31. Implement runtime permissions for sensitive features (location, storage, etc.).
32. Apply secure coding practices (data encryption / validation).
33. Perform testing and debugging using Android Studio tools.
34. Generate signed APK / AAB file for release.
35. Simulate Play Store deployment process (including app metadata and screenshots).
36. Perform performance optimization (memory, battery usage).

Text Books:

1. Advanced Android Application Development – *Joseph Annuzzi Jr., Lauren Darcey, Shane Conder* 1st Edition, 2022
2. Android Programming: The Big Nerd Ranch Guide
3. Mobile and Ubiquitous Systems: Computing, Networking and Services, Ahmet Soylu, Fan Liu, Karan Mitra, Yan Zhang, Tor-Morten Grønli, Springer, 2026
4. Advances in Mobile Computing and Multimedia Intelligence, Pari Delir Haghighi, Solomiia Fedushko, Gabriele Kotsis, Ismail Khalil, Springer, 2025
5. Advances Mobile Computing, Author: Dr. Vishnu Sharma, Publisher: S.K. Kataria & Sons Year 2023

Reference Books:

1. Professional Android Development – Reto Meier
2. Android Cookbook – Ian F. Darwin
3. Firebase Essentials – Ashok Kumar S

4. Mobile Computing. Author Vishnu Sharma, Publisher S.K. Kataria & Sons Year 2023
5. Mobile Computing and Sustainable Informatics, Editors Subarna Shakya, George Papakostas, Khaled A. Kamel, Publisher Springer Singapore Year 2023

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Understand the lifecycle of mobile app development	2 Understanding 3 Applying,
CLO2	Understand the Widget tree and learn to use pre-made Flutter Widgets for user interface design.	3 Applying, 6 Creating
CLO3	Learn to incorporate Image and Text Widgets to create simple	2 Understanding,
CLO4	Create full-fledged mobile app and deploy.	3 Applying, 6 Creating
CLO5	To understand the major tools, tools types with its properties, methods and events.	3 Applying,
CLO6	To understand the concept of Project development at server level.	6 Creating

Mapping of CLO with Pos & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CLO1	H	L			L		M	M	L	M	H	H	M	
CLO2	M	H		M	L		M	H		H	M		M	H
CLO3	M	M	H	L	H		M	L		L	H	M	H	H
CLO4	L	H	M	H	M	L	M		M		M	L	M	H
CLO5	M	H	H	M	H	L	H		L		H	L	H	H
CLO6	M	M	M	H	M		M	H	H	H	M	M	M	H

H: High, M: Medium, L: Low