Department of Computer Science and Engineering
Lesson Plan

Course Title: Mobile Application Development   **Course Code: CSE 2210**
Level/Term: 5ᵗʰ   **Section:** D
Credit: 1.5
Prerequisite: None
Session: Fall 2024

Instructor: Salman Farsi, Lecturer, DCSE, PU.
Lab schedule: Tuesday (11-1.30)

                                                          Room No.: 907
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Rationale:

      This course will introduce students to the foundational concepts and tools necessary for developing mobile applications, focusing on Kotlin programming and Android development. It aims to build practical skills in creating intuitive, functional mobile interfaces.

Course Objectives:

The main objectives of this course are:

1. Build a strong foundation in Kotlin and Android project structures for robust app development.
2. Design and implement dynamic UIs using Jetpack Compose.
3. Integrate Firebase for data storage, authentication, and synchronization.
4. Handle network requests, JSON parsing, and local databases efficiently.
5. Apply software design principles and effective debugging for maintainable, error-free code.

Course Learning Outcomes (CLOs):
Upon successful completion of this course, students will be able to:

CLO1	**Explain (C2)** the fundamental concepts of mobile application development, including mobile operating systems and development environments.
CLO2	**Design (C5)** intuitive user interfaces using Android XML layouts, implementing best practices for usability and aesthetics.

CLO3	**Implement (C3)** data storage solutions in Android applications using SharedPreferences, SQLite, and cloud storage options such as Firebase.
CLO4	**Develop (C6)** mobile applications that incorporate advanced Android features like networking, location-based services, and multithreading.

Mapping of Course Outcomes to Program Outcomes-

	PLO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CLO1	√											
CLO2			√		√							
CLO3		√		√								
CLO4			√	√								

Mapping Course Learning Outcomes (CLOs) with the Teaching-Learning and Assessment Strategy:

CLOs	KPA	Teaching-Learning Strategy	Assessment Strategy
CLO1	K3	● Lectures/Instructions ● Reading Materials/PPT slides containing flowcharts, graphs, diagrams, charts, tables, Venn diagrams, etc. ● Flipped classroom ● Whiteboard/Blackboard ● On the spot class/quiz tests	Clicker questions, Multiple Choice, Fill-in-the-blanks, Label, Match, True/False, Quizzes, Summary, Essay, Diagrams, Presentation, Short Answers
CLO2	K3		
CLO3	K3		
CLO4	K3		

Marks Distribution: Class attendance (10%), Project (30%), Lab Performance Test (20%), Presentation/ Viva (20%) and Report (20%).

Textbooks, References, and Online Resources:

1. John Horton, *Android Programming with Kotlin for Beginners*, Packt Publishing, 2019.
2. Josh Skeen and David Greenhalgh, *Kotlin Programming: The Big Nerd Ranch Guide*, Big Nerd Ranch Guides, 2018.
3. Antonio Leiva, *Kotlin for Android Developers: Learn Kotlin while developing an Android App*, Leanpub, 2017.

Weekly schedule:

Week	Topic	Teaching strategy	Course outcome	Assessment Strategy
Week-1	Kotlin Basics, Android Project Structure, Introduction to Jetpack Compose.	Lecture	CLO1	N/A
Week-2	Jetpack Compose Layouts, State Management in Compose, User Input Handling.	Lecture	CLO1	N/A
Week -3	Firebase Setup, Firebase Firestore, Firebase Authentication.	Lecture	CLO1	Class Performance
Week -4	Introduction to Networking, Retrofit Setup, Parsing JSON.	Lecture	CLO3	Class Performance
Week -5	Room Database Setup, Room Database Operations, ViewModel and LiveData.	Lecture	CLO3	Class Performance
Week -6	Introduction to Sockets, Socket.IO Integration, Handling Real-Time Data.	Lecture/ Provide Feedback	CLO3	N/A
Week -7	**Mid Term Exam**	----	----	----
Week -8	Software Design Principles, Debugging in Android Studio.	Lecture/ Provide Feedback	CLO4	N/A
Week -9	History of bdapps, how bdapps works, how to monetize your apps, bdapps Account Creation, bdapps Lite app Creation	Lecture	CLO2	N/A
Week -10	What is API?, How do API works?, SMS API, USSD API, Subscription API, CAAS API, OTP API	Lecture	CLO2	N/A
Week -11	bdapps API integration with a new/existing project	Lecture	CLO2	N/A
Week -12	Firebase and API Integration, Handling User Authentication and APIs, Optimizing Data Fetching.	Lecture	CLO4	Class Performance
Week -13	Project Final Submission	Provide Feedback	CLO4	Project and Report