Riphah International Colleges

A Project of Riphah International University

Course Outline

Course Information	**Course Title**	**Mobile Application Development**		
	Course ID	CS2703	**Course Type**	CS Elective
	Credit hours	3 (2+1)	**Hours per week (C-L)**	3-3
	Program(s)	ADP Computing CS	**Preferred Semester**	4th
Course Description	This course provides a comprehensive introduction to **mobile application development**, focusing on the latest frameworks and tools for building cross-platform mobile apps. Students will learn to design, develop, test, and deploy mobile applications using **Flutter** and **React Native**, two of the most popular frameworks for cross-platform development. The course covers essential topics such as **UI/UX design**, **state management**, **API integration**, **database management**, and **app deployment**. Students will gain hands-on experience by building real-world mobile applications, starting from basic concepts and progressing to advanced topics like **performance optimization**, **security**, and **emerging trends** in mobile development. By the end of the course, students will have developed a **complete mobile application** as part of their final project, which they can showcase in their portfolios.			
Course Objectives (CO)	*The objective of this course is to enable students to understand;*			
	No.	**Objective**		
	CO1.	Fundamentals of mobile application development.		
	CO2.	Learn to develop cross-platform mobile apps using the latest frameworks (e.g., Flutter, React Native).		
	CO3.	Gain proficiency in designing user interfaces (UI) and user experiences (UX).		
	CO4.	Explore backend integration, APIs, and database management for mobile apps.		
	CO5	Understand app deployment and publishing on app stores (Google Play, Apple App Store).		
	CO6	Develop a complete mobile application as a final project.		
Lecture type	**Class room Lectures, Lab Sessions, Project Presentation**			
Prerequisites	Introduction to Programming, Object-Oriented Programming			

Text Book and Reference Books

	Title	Edition	Authors	Publisher
Textbook	Flutter in Action	Latest Edition	Eric Windmill	Manning Publications
Reference Books	Mobile Application Development: Practice and Experience	Latest	Jagdish Krishanlal Arora	Wiley
	Online Platforms: Flutter Documentation, React Native Documentation,			

Grade Distribution:

Evaluation Type	Percentage (%)	Activities
Assignments & & Presentations	10%	Min. 4 in the semester
Quiz & Project	10%	Min. 4 in the semester
Lab	15%	Min. 1 (for Lab it is necessary) in a week
Mid Term	25%	Contents from Week 1 to Week 8 will be included
Final Term	40%	Contents from Week 8 to Week 17
Total	**100**	
Methods of Evaluation	Quizzes, Assignments, Mid/Final exam, Lab, Project	
Notes	Labs are managed and evaluated separately	

Course Contents:

Week	Lecture No	Lecture Contents	Activities
Week 1	**Lect. 1**	**Introduction to Mobile Application Development** ♦ Course overview and objectives ♦ Importance of mobile app development ♦ Overview of mobile platforms (Android, iOS, Cross-Platform)	
	Lect. 2	♦ Setting up the development environment ♦ Installing IDEs (Android Studio, Xcode, VS Code) ♦ Introduction to Flutter and React Native	
Week 2	**Lect. 3**	**Fundamentals of Mobile App Development** ♦ Introduction to Flutter ♦ Widgets, layouts, and state management	Assignment No 1
	Lect. 4	♦ Introduction to React Native ♦ Components, props, and state	
Week 3	**Lect. 5**	**User Interface (UI) Design** ♦ Principles of UI/UX design ♦ Material Design (Android) and Human Interface Guidelines (iOS)	Quiz/Test 1
	Lect. 6	♦ Building responsive UIs ♦ Using Flutter widgets and React Native components	
Week 4	**Lect. 7**	**Navigation and Routing** ♦ Navigation in Flutter ♦ Navigator, routes, and named routes	
	Lect. 8	♦ Navigation in React Native ♦ React Navigation library	
Week 5	**Lect. 9**	**State Management** ♦ State management in Flutter ♦ setState, Provider, Riverpod	Assignment No 2
	Lect. 10	♦ State management in React Native ♦ useState, useContext, Redux	
Week 6	**Lect. 11**	**Working with APIs** ♦ RESTful APIs and JSON ♦ Making HTTP requests (GET, POST, PUT, DELETE)	Quiz/Test 2
	Lect. 12	♦ Integrating APIs in Flutter and React Native ♦ Using packages like http (Flutter) and axios (React Native)	
Week 7	**Lect. 13**	**Database Integration** ♦ Local storage options ♦ SQLite, SharedPreferences (Flutter), AsyncStorage (React Native)	
	Lect. 14	♦ Firebase integration ♦ Firebase Firestore, Realtime Database, and	

		Authentication	
Week 8	**Lect. 15**	**Advanced UI Components** ♦ Custom widgets and animations in Flutter	
	Lect. 16	♦ Custom components and animations in React Native	
Week 9	**Lect. 17 & 18**	**Mid Term Examination**	
Week 10	**Lect. 19**	**App Testing and Debugging** ♦ Unit testing and widget testing in Flutter	
	Lect. 20	♦ Testing in React Native ♦ Jest and React Native Testing Library	
Week 11	**Lect. 21**	**App Deployment** ♦ Preparing apps for deployment ♦ Building APKs (Android) and IPAs (iOS)	Assignment No 3
	Lect. 22	♦ Publishing apps on Google Play and Apple App Store	
Week 12	**Lect. 23**	**Cross-Platform Development** ♦ Advantages and challenges of cross-platform development	Quiz/Test 3
	Lect. 24	♦ Comparing Flutter and React Native	
Week 13	**Lect. 25**	**Performance Optimization** ♦ Optimizing app performance in Flutter	

	Lect. 26	♦ Optimizing app performance in React Native	
Week 14	**Lect. 27**	**Security in Mobile Apps** ♦ Secure coding practices ♦ Data encryption, secure storage, and secure API calls	Assignment No 4
	Lect. 28	♦ Handling permissions and user privacy	
Week 15	**Lect. 29**	**Emerging Trends in Mobile Development** ♦ Introduction to Progressive Web Apps (PWAs)	Quiz/Test 4
	Lect. 30	♦ Exploring AI and ML in mobile apps	
Week 16	**Lect. 31**	**Final Project Development** ♦ Project planning and design ♦ Defining app features and architecture	
	Lect. 32	♦ Implementing core features of the final project	
Week 17	**Lect. 33**	♦ Revision & Final Presentations	
	Lect. 34	♦ Revision & Final Presentations	
Week 18	**Lect. 35 & 36**	**FINAL TERM EXAM**	