



# COMSATS University Islamabad

## Department of Computer Science

### Course Syllabus

#### Course Information

Course Code: **CSC303**

Credit Hours: **3 (2,1)**

Lab Hours/Week: **3**

Course Title: **Mobile Application Development**

Lecture Hours/Week: **2**

Pre-Requisites: **CSC241-Object Oriented Programming**

#### Catalogue Description:

This course introduces the fundamental concepts related to the design and implementation of mobile application that uses JavaScript and React Native. Topics Include: Overview; Concepts of JavaScript; Programming in React Native; GitHub; Concepts of React Navigation; Working with Multiple Screens with React Navigation; Working with Persistent Storage using AsyncStorage; Retrieving Data from Server using API; State Management and Redux; Accessing Device Camera; GPS & Google Maps API; Working with Mobile Sensor; and Ejecting & Publishing Mobile Applications.

#### Text and Reference Books

##### Textbook:

1. React Native in Action, Nader Dabit, Manning Publications, 2019.

##### Reference Books:

1. Fullstack React Native, Shoemaker, Sophia, Djirdeh, Houssein,, Published by Fullstack.io, 2019.
2. Eloquent JavaScript: A Modern Introduction to Programming, Marijn Haverbeke, Manning Publications, 2018.

#### Week wise Plan:

Lecture #	CDF Unit #	Topics Covered	Reading Material
1.	1	Importance of Mobile Applications, Growth of Mobile Devices & Users, and Mobile Platforms.	Dabit: Ch1
2.	1	Client-Side Technologies, Mobile Application Development Technologies, and Hybrid Mobile Application Development.	Dabit: Ch1
3.	2	Introduction to JavaScript: Basics, Arrays (Concat, CopyWithin, Entries, Fill, Filter, Find, Map, ForEach, and Reduce).	Haverbeke: Ch1
4.	2	JS Arrays: Slice, PoP, Push, Flat, Sort Operations; and JavaScript Functions & ES6 Arrow Functions.	Haverbeke: Ch4
5.	2	JavaScript: Prototype-Based Classes, ES6 Classes, Hoisting, and Class Expression.	Haverbeke: Ch6
6.	2	JS Constructor, Getter Methods, Static Methods, Public & Private Fields, and Inheritance.	Haverbeke: Ch6
7.	3	Introduction to React Native, Installation, and Environment Setting.	Djirdeh: Ch1
8.	3	Creating First React Native Expo Project, Installing Expo-CLI & Creating Project, Understanding Directory Structure, Running Project on Mobile Device, and Emulator.	Djirdeh: Ch1
9.	3	Creating First React Native CLI Project, Understanding	Djirdeh: Ch1

		Directory Structure, Setting-up Mobile Emulator, and Running React Native CLI Project.	
10.	3	Working with Expo Snack, Creating a New Expo Snack, Managing Snacks, Running on Web, Android & iOS Web Based Emulators, and Running on Physical Device.	Djirdeh: Ch1
11.	3	Function-Based Components & React Hooks, Class-Based Components, and State Object.	Djirdeh: Ch2
12.	3	Developing Application with View, Text, Text-Input, Buttons; and Event Handling.	Djirdeh: Ch2
13.	3	Styling, Touchable-Opacity, Pressable, Flat-List, and Scroll-View.	Djirdeh: Ch2
14.	3	Creating Custom Components, Passing Props & Events to Child Components, and Customizing Styles.	reactnative.dev
15.	3	Using Icons & Fonts Libraries.	reactnative.dev
16.	3	Unit Testing, Writing Unit Tests, Executing Tests, and Testing UI Elements.	reactnative.dev
17.	<b>Mid-Term Exam</b>		
18.			
19.	3	Debugging the React Native Application, Using Breakpoints, Call Stack, Debugging UI with Element Inspector; and Version Control Using GitHub.	reactnative.dev
20.	4	Introduction to React Navigation, and Working with Multiple Screens with React Navigation.	Djirdeh: Ch3
21.	4	Customizing Headers, Screen Options, and Header Interaction with Screen Components.	Djirdeh: Ch6
22.	4	Drawer & Material Bottom Tab Navigators, Customizing Drawer Navigator, and Using Icons.	Djirdeh: Ch6
23.	4	Working with Multiple Navigators, and Managing Navigators Stack.	Djirdeh: Ch6
24.	4	Customizing Themes, Understanding Application Structure, and Managing Dependencies.	Reactnavigation.org
25.	5	Working with Persistent Storage Using Async-Storage.	Djirdeh: Ch8
26.	5	Retrieving Data from Server Using API, Fetch & Axios Libraries, and Using Placeholder & Rapid API.	Djirdeh: Ch8
27.	5	Using Google Firebase, Firestore & Realtime Database, and Storing & Retrieving Data from Google Firebase.	Reactnative.dev
28.	5	State Management using Redux, Creating & Managing Redux Store, and Dispatcher.	Reactnative.dev
29.	5	Working with Context API, Passing & Accessing Data Through Context API.	Reactnative.dev
30.	5	Tracking Live Mobile Device Location using GPS & Working with Google Maps API.	Reactnative.dev
31.	5	Accessing Device Camera, and Working with Mobile Sensor.	Reactnative.dev
32.	5	Ejecting & Publishing Mobile Application.	Reactnative.dev

Final Term Exam					
Student Outcomes (SOs)					
S.#	Description				
1	Apply knowledge of computing fundamentals, knowledge of a computing specialization, and mathematics, science, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements				
2	Identify, formulate, research literature, and solve <i>complex</i> computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines				
3	Design and evaluate solutions for <i>complex</i> computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations				
4	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to <i>complex</i> computing activities, with an understanding of the limitations				
5	Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings.				
9	Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.				
Course Learning Outcomes (CLO)					
Sr.#	Unit #	Course Learning Outcomes	Blooms Taxonomy Learning Level	SO	
CLO's for Theory					
CLO-1	1	Summarize the concepts of mobile application development technologies.	<i>Understanding</i>	1	
CLO-2	2	Illustrate the concepts of Java Scripting for mobile applications.	<i>Applying</i>	2,4	
CLO-3	3-4	Demonstrate the concepts of React Native & React Navigation in the context of mobile application development	<i>Applying</i>	2-4	
CLO's for Lab					
CLO-4	3	Apply the concepts of JavaScript and React Native for mobile applications.	<i>Applying</i>	2-4	
CLO-5	4-5	Develop advance mobile applications with multiple screens and APIs having persistent storage.	<i>Creating</i>	2-5,9	
CLO Assessment Mechanism					
Assessment Tools	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
Quizzes	Quiz 1	Quiz 2	Quiz 3&4	-	-
Assignments	-	Assignment 1	Assignment 2-4	Lab Assignments	-
Midterm Exam	Midterm Exam	Midterm Exam	Midterm Exam	-	-

Final Term Exam	Final Term Exam				-
Project	-	-	-	-	Lab Project

### Policy & Procedures

- **Attendance Policy:** Every student must attend 80% of the lectures as well as laboratory in this course. The students falling short of required percentage of attendance of lectures/laboratory work, is not allowed to appear in the terminal examination.

- **Course Assessment:**

	Quizzes	Assignments	Mid Term Exam	Terminal Exam	Total
<b>Theory (T)</b>	15	10	25	50	100
<b>Lab (L)</b>	-	25	25	50	100
<b>Final Marks (T+L)</b>	<b><math>(T/100) * 67 + (L/100) * 33</math></b>				

- **Grading Policy:** The minimum passing marks for each course is 50% (In case of LAB; in addition to theory, student is also required to obtain 50% marks in the lab to pass the course). The correspondence between letter grades, credit points, and percentage marks at CUI is as follows:

Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F
<b>Marks</b>	$\geq 85$	80 – 84	75 – 79	71 – 74	68 – 70	64 – 67	61 – 63	58 – 60	54 – 57	50-53	$< 50$
<b>Cr. Point</b>	3.67-4.00	3.34-3.66	3.01-3.33	2.67-3.00	2.34-2.66	2.01-2.33	1.67-2.00	1.31-1.66	1.01-1.30	0.10-1.00	0.00

- **Missing Exam:** No makeup exam will be given for final exam under any circumstance. When a student misses the mid-term exam for a legitimate reason (such as medical emergencies), his grade for this exam will be determined based on the Department policy. Further, the student must provide an official excuse within one week of the missed exam.
- **Academic Integrity:** All CUI policies regarding ethics apply to this course. The students are advised to discuss their grievances/problems with their counsellors or course instructor in a respectful manner.
- **Plagiarism Policy:** Plagiarism, copying and any other dishonest behaviour is prohibited by the rules and regulations of CUI. Violators will face serious consequences.