UKA TARSADIA UNIVERSITY

M.C.A. (3rd Semester) Syllabus, 2024-2025

Course Code: CS8028 Course Title: Mobile Application Development using iOS

Course Credits: [Lecture: 03, Tutorial: 00, Practical: 02]

Prerequisites: Basic understanding of Swift programming. Knowledge of mobile application development concepts and user interface design principles.

Objectives: Develop and integrate user interfaces using SwiftUI, including advanced components, navigation strategies, and data management techniques for creating robust applications.

Course Outcomes: Upon completion of the course, students shall be able to

CO1: Describe and apply fundamental SwiftUI views and interactive elements for building user interfaces.

CO2: Design and implement dynamic and advanced UI components in SwiftUI applications.

CO3: Analyze and utilize navigation strategies for managing data-driven user interactions.

CO4: Integrate SwiftUI with existing frameworks and legacy applications to enhance functionality.

CO5: Manage and synchronize application state across different views and components.

CO6: Implement and manage data persistence and integration solutions in SwiftUI applications.

Course Objective and Course Outcomes Mapping:

- Develop and integrate user interfaces using SwiftUI, including advanced components: CO1, CO2
- Navigation strategies: CO3
- Data management techniques for creating robust applications: CO4, CO5 and CO6.

Programme Outcomes: The student will have

PO1: Proficiency in and ability to identify problems related to computer science as well as design and apply computational knowledge to solve them.

PO2: Ability to design, develop, test and maintain system, component, product or process as per needs and specification.

PO3: Understanding of professional and ethical role and responsibility.

PO4: Recognition of the need for and an ability towards life-long learning.

PO5: Knowledge of programming languages, database systems, operating systems, software engineering, Web & Mobile technology and relevant modern issues.

PO6: Ability to demonstrate the use of modern tools, models and languages to solve problems related to software development.

PO7: An ability to communicate and present knowledge effectively.

Programme Outcomes and Course Outcomes mapping:

Course Outcomes	Programme Outcomes						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	✓			✓	✓	✓	✓
CO2		✓		✓	✓	✓	
CO3	✓		✓	✓	✓	✓	
CO4				✓	✓	✓	
CO5				✓	✓	✓	
CO6				✓	✓	✓	

Curriculum Unit Titles

Units	Unit Description	Weightage
1	Basic SwiftUI Views and Controls	
	1.1. iOS Applications	[15%]
	1.2. Swift Programming Basics	
	1.3. Laying Out Components	
	1.4. Text, Image, Button, Segmented Control, TextField, Picker	
	1.5. View Modifier, View Builder, Symbol	
	1.6. Integrating UIKit into SwiftUI, Adding SwiftUI to Legacy UIKit App	
2	List Views, Scroll Views, and Advanced Components	[20%]
	2.1. Scroll Views, Creating List of Static Items	
	2.2. Custom Rows in a List, Adding/Deleting Rows	
	2.3. Editable List View, Editable Collection, Searchable List	
	2.4. LazyHStack and LazyVStack, LazyHGrid and LazyVGrid	
	2.5. Scrolling Programmatically, Expanding Lists	
	2.6. Disclosure Groups, Create SwiftUI Widgets	
3	Navigation	[15%]
	3.1. Using NavigationStack	
	3.2. Typed Data-driven Navigation with NavigationStack	
	3.3. Untyped Data-driven Navigation with NavigationStack	
	3.4. Working with NavigationSplitView	
	3.5. Using TabView	
	3.6. Programmatically switching tabs on a TabView	
4	SwiftUI with Data	[20%]
	4.1. Using @State to drive a View’s behaviour	
	4.2. Using @Binding to pass a state variable to child views	
	4.3. Core location wrapper @ObservedObject	
	4.4. Preserve model’s life cycle using @StateObject	
	4.5. Sharing state object using @EnvironmentObject	
	4.6. Using Observation to manage model data	
5	Combine and Firebase	[15%]
	5.1. Introduction to Combine	
	5.2. Managing Memory and Validating a Form	
	5.3. Fetching Remote Data and Visualization	
	5.4. Sign in with Apple	
	5.5. Integrating Firebase into SwiftUI	
	5.6. Google Sign in	
6	Core Data and Swift Data	[15%]
	6.1. Integrating Core Data with SwiftUI	
	6.2. Showing Core Data Objects with @FetchRequest	
	6.3. Adding Core Data Objects from a SwiftUI View	
	6.4. Filtering Core Data Objects with Predicate	
	6.5. Deleting Core Data Objects, @SectionedFetchRequest	
	6.6. Working with SwiftData	

Course Units and Course Outcomes Mapping:

Unit No.	Unit	Course Outcomes					
		CO1	CO2	CO3	CO4	CO5	CO6
1	Basic SwiftUI Views and Controls	✓					
2	List Views, Scroll Views, and Advanced Components		✓				
3	Navigation			✓			
4	SwiftUI with Data				✓		
5	Combine and Firebase					✓	
6	Core Data and Swift Data						✓

Computing Environment:

A student must have the following computing environment in the laboratory and/or on his/her laptop.

- CE#1: Xcode 12.0 or above

Text Books:

1. Juan C. Catlan, "SwiftUI Cookbook", Packt Publishing Ltd.

References :

1. Wallace Wang, "Beginning iPhone Development with SwiftUI", Apress.
2. Wallace Wang, "Pro iPhone Development with SwiftUI", Apress.
3. Mukesh Sharma, "iOS Development with SwiftUI", BPB.