Uka Tarsadia University

B. Tech.

Semester III

MOBILE APPLICATION DEVELOPMENT

IT4018

Effective from July-2022

Syllabus version: 1.00

Subject Code	Subject Title	Teaching Scheme			
		Hours		Credits	
		Theory	Practical	Theory	Practical
IT4018	Mobile Application Development	3	2	3	1

Subject Code	Subject Title	Theory Examination Marks		Practical Examination Marks	Total Marks
		Internal	External	CIE	
IT4018	Mobile Application Development	40	60	50	150

Objectives of the course:
- To deliver fundamentals of mobile application designs and development with android.

- To unfold various Android services, data storage and networking in mobile application development.

Course outcomes:

Upon completion of the course, the student shall be able to,

CO1: Understand basics of android architecture with activities and fragments
CO2: Use view groups comprising layouts and views in application
CO3: Work with menus, graphics, animation, still images and video
CO4: Understand and apply data storage in android application
CO5: Understand services and apply different services
CO6: Understand and apply multimedia and networking

Sr. No.	Topics	Hours
	Unit – I	
1	**Introduction to Android:** Android Versions, Features of Android, Android Architecture Components (AAC), Android on different devices, Developer community, Android SDK, Android development tools, Android virtual devices, Understanding different activities, Intents and Intent filters, Resolution and Filtering, Fragments, Displaying notification, The SOLID principles.	8

	Unit – II	
2	**Android User Interface (UI) and UI with Views and ViewGroup:** Understanding the components of screen, Display orientation, Managing changes to screen orientation, Basic design patterns Utilizing the action bar, UI notification, Using basic views, Picker view, List views, Specialized fragments.	9
	Unit – III	
3	**Displaying Pictures and Menus with Views:** Image views, Video views, Additional view, Creating an options menu – Handling click events, Creating contextual menus, Creating floating context menu, and Creating popup menus, Creating checkable menu items, Adding menu items based on intent, Allowing activities to be added to other menus.	5
	Unit – IV	
4	**Android Data Storage Mechanism:** Saving and loading user preferences, Persisting data to files, Creating and using the database, Sharing data in android, Content providers.	8
	Unit – V	
5	**Android Services:** Introduction to android services and their needs, Life cycle, Service task management, Management of SMS, Notification services, User alerts, Alarm services, Sending an E-mail, Displaying maps, Handling location data services and other services.	9
	Unit – VI	
6	**Multimedia and Networking in Android:** Consuming web services using HTTP, Handling JSON data, Media APIs, Multimedia recording, Integration of web services, AndroidX libraries.	6

Sr. No.	Mobile Application Development (Practical)	Hours
1	Install Android Studio Create a virtual device, Create and Run Hello World on emulator and device, Explore project layout, Generate and view log statements, Explore manifest file.	2
2	Make Your First Interactive UI Develop an android app which displays Toast Message "Hello, welcome to Android Lab" when user Click on Button, Experiment with using different layouts.	2
3	Develop an android app which displays a form to get following information from user. Username, Password, Email Address, Phone Number, Country, State, Gender, Interests, Birth Date, Birth Time	2

	Form should be followed by a Button with label "Submit". When user clicks the button, a message should be displayed on New Activity using Intent to user describing the information entered.		
4	Start Activities with Implicit Intents Send an implicit intent to start an activity (open web site), Send an implicit intent to start an activity (open location), Use an intent filter to allow other apps to start an activity in your app, Use Share Compat. Intent Builder	2	
5	Use Keyboards, Input Controls, Alerts, and Pickers
Experiment in your app with different keyboards for user input, spelling suggestions, and auto-capitalization, Add a spinner input control for selecting one value out of a set of values. Create new app to show an alert, and record the user's selection (OK or Cancel). MOVE TO CONCEPT, Update app to show date and time pickers and record the user's selections.	2	
6	Use an Options Menu and Radio Buttons
Set up an options menu and overflow menu, add items to the option (overflow) menu, add radio buttons for user selection, Add Up navigation to the app bar.	2	
7	Theme, Custom Styles, Drawables
Define and use a theme, Define and use a custom style that uses a drawable	2	
8	Add a FAB and Cards
Create an app that uses a Floating Action Button (FAB), Add an activity that uses cards. Optionally, style the cards, customize your app's theme and styles to use Material Design styles and colors.	2	
9	Create an AsyncTask\
Create a simpleAsyncTask to do work in the background	2	
10	Google APIs Explorer, JSON, Books API
Use the Books APIin the Google APIs Explorer to investigate request format and JSON response format.
Create a new app that uses the Books API and Async Task to search for the author of a book.	2	
11	Create an app with a Broadcast Receiver	2	
12	Create an application that will display toast (Message) on specific interval of time.	2	
13	Get and Save User Preferences
Implement Settings menu to allow users to enter preferences, implement code to retrieve and user preferences	2	
14	Create an app that allows users to enter notes
Save the notes in a SQLite database, Create an app that stores data in an SQL database, Display the data in a Recycler View, Allow users to add, delete, and edit data items, Add a content provider for your SQLite database	2	
15	Implement a loader, register a Listener for the Loader, Test the loader by checking that the Items in the UI update when the data generated by the loader changes, Use an AsyncTaskLoader to update a scrolling list of notes titles as the user adds more notes, register a Listener for the Loader, Test the loader by checking that the Items in the UI update when the underlying data changes	2	

Text book:
1. Wei Meng Lee – "Beginning Android 4 Application Development", Wrox Publication.

Reference books:
1. Joseph Annuzzi, Jr.Lauren Darcey, Shane Conder – "Advanced Android Application Development", 4th Edition, Pearson.
2. Pradeep Kothari – "Android Application Development Black Book", DreamTech.
3. John Horton – "Android Programming for beginners", Third edition, Packet Publication.

Course objectives and Course outcomes mapping:
- To deliver fundamentals of mobile application designs and development with android: CO1, CO2, CO3

- To unfold various Android services, data storage and networking in mobile application development: CO4, CO5, CO6

Course units and Course outcomes mapping:

Unit No.	Unit Name	Course Outcomes					
		CO1	CO2	CO3	CO4	CO5	CO6
1	Introduction to Android	✓					
2	Android User Interface (UI) and UI with Views and Views Group		✓				
3	Displaying Pictures and Menus with Views			✓			
4	Android Data Storage Mechanism				✓		
5	Android Services					✓	
6	Multimedia and Networking in Android						✓

Programme outcomes:

PO 1: Engineering knowledge: An ability to apply knowledge of mathematics, science, and engineering.

PO 2: Problem analysis: An ability to identify, formulates, and solves engineering problems.

PO 3: Design/development of solutions: An ability to design a system, component, or process to meet desired needs within realistic constraints.

PO 4: Conduct investigations of complex problems: An ability to use the techniques, skills, and modern engineering tools necessary for solving engineering problems.

PO 5: Modern tool usage: The broad education and understanding of new engineering techniques necessary to solve engineering problems.

PO 6: The engineer and society: Achieve professional success with an understanding and appreciation of ethical behavior, social responsibility, and diversity, both as individuals and in team environments.

PO 7: Environment and sustainability: Articulate a comprehensive world view that integrates diverse approaches to sustainability.

PO 8: Ethics: Identify and demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work.

PO 9: Individual and team work: An ability to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give/receive clear instructions.

PO 11: Project management and finance: An ability to demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life-long learning: A recognition of the need for, and an ability to engage in life-long learning.

Programme outcomes and Course outcomes mapping:

Programme Outcomes	Course Outcomes					
	CO1	CO2	CO3	CO4	CO5	CO6
PO1		✓	✓	✓	✓	
PO2			✓	✓	✓	
PO3		✓		✓	✓	✓
PO4						
PO5			✓	✓	✓	✓
PO6						
PO7						
PO8						
PO9						
PO10						
PO11				✓		
PO12						