20MCA243	MOBILE APPLICATION DEVELOPMENT LAB	CATEGORY	L	T	P	CREDIT
		LAB	0	1	3	2

Preamble: This is a practical course on Mobile Application Development and student will learn how to program in Android Platform and develop applications using SQLite that run on Andriod Operating System.

Prerequisite: Basic knowledge on programming and database concepts.

Course Outcomes: After the completion of the course the student will be able to

CO No.	Course Outcome (CO)	Bloom's Category Level
CO 1	Design and develop user interfaces for mobile apps using basic building blocks, UI components and application structure using Emulator	Level 3: Apply
CO 2	Write simple programs and develop small applications using the concepts of UI design, layouts and preferences	Level 3: Apply
CO 3	Develop applications with multiple activities using intents, array adapter, exceptions and options menu.	Level 3: Apply
CO 4	Implement activities with dialogs, spinner, fragments and navigation drawer by applying themes	Level 3: Apply
CO 5	Develop mobile applications using SQLite.	Level 3: Apply

Mapping of course outcomes with program outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	3	3	3	1	3	2	3		2			
CO 2	3	3	3	2	3	2	3		2			
CO 3	3	3	3	2	3	2	3		2			
CO 4	3	3	3	2	3	2	3		2			
CO 5	3	3	3	2	3	3	3		2			

3/2/1: High/Medium/Low

Assessment Pattern

Bloom's Category	Continuous Assessment Tests		End Semester Examination
	1	2	
Remember(K1)			
Understand(K2)			
Apply(K3)	50	50	50
Analyse(K4)			
Evaluate(K5)			
Create(K6)			

Mark distribution

Total Marks	CIE	ESE	ESE Duration
100	50	50	3 hours

Continuous Internal Evaluation Pattern:

Maximum Marks: 50	
Attendance	7½
Maintenance of daily lab record and GitHub management	10
Regular class viva voce	7½
Timely completion of day-to-day tasks	10
Tests/Evaluation	15

End Semester Examination Pattern:

Maximum Marks: 50			
Verification of Daily program record and Git Repository			5 marks
Viva			10 marks
Problem solving (Based on difficulty level, one or more questions may be given)	Flowchart / Algorithm / Structured description of problem to explain how the problem can be solved / Interface Design	15%	35 marks
	Program correctness	50%	
	Code efficiency	15%	
	Formatted output	20%	

Course Level Assessment Questions

Course Outcome 1 (CO1):

1. Design a Login Form with username and password using LinearLayout and toast valid credentials
2. Write a program that demonstrates Activity Lifecycle.
3. Implementing basic arithmetic operations of a simple calculator
4. Implement validations on various UI controls

Course Outcome 2 (CO2)

1. Design a registration activity and store registration details in local memory of phone using Intents and SharedPreferences
2. Design a simple Calculator using GridLayout and Cascaded LinearLayout
3. Create a Facebook page using RelativeLayout; set properties using .xml file
4. Develop an application that toggles image using FrameLayout

Course Outcome 3(CO3):

1. Implement Adapters and perform exception handling
2. Implement Intent to navigate between multiple activities
3. Develop application that works with explicit intents
4. Implement Options Menu to navigate to activities
5. Develop an application that uses ArrayAdapter with ListView.

Course Outcome 4 (CO4):

1. Develop an application that use GridView with images and display Alert box on selection
2. Develop an application that implements Spinner component and perform event handling
3. Apply themes via code and manifest file
4. Develop application using Fragments
5. Implement Navigation drawer

Course Outcome 5 (CO5):

1. Create database using SQLite and perform INSERT and SELECT
2. Perform UPDATE and DELETE on SQLite database
3. Develop an application as a micro project which uses SQLite database as an assignment

Syllabus

Fundamentals: Basic Building blocks – Activities, Services, Broadcast Receivers and Content providers, UI Components – Views and notifications Components for communication -Intents and Intent Filters
Application Structure: AndroidManifest.xml, user-permission – sdk, Resources and R.java, Assets, Layouts and Drawable Resources, Activities and Activity lifecycle.
Emulator-Android Virtual Device: Launching emulator, Editing emulator settings, Emulator shortcuts, Logcat usage, Introduction to DDMS
Basic UI design: Form widgets, Text Fields, Validation of EditText, Layouts, [dip, dp, sip, sp] versus px
Preferences: Shared Preferences, Preferences from xml
Menu: Option menu, Context menu, menu from xml, menu via code
Intents: Explicit Intents, Implicit intents
UI design: Time and Date, Images and media, Android Adapter and ListView, Composite, Alert Dialogs and Toast, Popup, Fragments, Navigation drawer
Tabs, Tab Activity Styles & Themes: styles.xml, drawable resources for shapes, gradients (selectors), style attribute in layout file, Applying themes via code and manifest file
Content Providers: SQLite Programming, SQLite Open Helper, SQLite Database, Cursor, Reading and updating Contacts, Reading bookmarks

Reference Books

1. Joseph Annuzzi Jr, Lauren Darcey, Shane Condor, "Advanced Android Application Development, Developers Library", Pearson Education, 4th Edition (2015)

2. Lauren Darcey, Shane Condor, "Android, Wireless Application Development", Pearson Education, 3rd Edition.

3. Paul Deitel, Harvey Deitel, Alexander Wald, "Android 6 for programmers, An AppDriven Approach", Pearson Education

4. Rap Payne, "Beginning App Development with Flutter: Create Cross-Platform Mobile Apps", Apress (2019)

Course Contents and Lecture Schedule

Sl No	Topic	No. of hours
1	Fundamentals – Basic building blocks	3
2	Application structure, layout and resources	3
3	Android Virtual Device, Activity Lifecycle	3
4	Basic UI Design and EditText Validation	4
5	Shared Preferences, RelativeLayout, FrameLayout, GridLayout and Preferences from xml	9
6	ArrayAdapter, ListView and Exception handling	3
7	Various Menu options	3
8	Explicit and Implicit Intents	3
9	Images and media, Dialogs, Spinner component, Popups, Fragments, Navigation drawer	6
10	Applying themes and styles .xml	3
11	SQLite Programming	6