SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Master of Computer Applications

MCA Semester III

Subject Name: Android Programming **Subject Code:** MTCA13301

Type of course: Professional Core Course

Prerequisite: Knowledge of the Core Java Programming, Database concepts

Rationale: After studying this course, students will be able to understand the basic concepts of Android Mobile Operating System and the importance of various coding techniques. After successful completion students will be able to create mobile apps.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
2	0	4	4	60	25	15	60	40	200

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1.	**Introduction to ANDROID:** ANDROID SDK Features, Introduction to Development Features, ANDROID development tools. **Basics of ANDROID:** Basics of an ANDROID application, introduction to manifest, application life cycle, ANDROID activities. **Fundamentals of Kotlin for Beginner:** Variable Declaration: Type Inference, Null Safety Conditionals Functions: Simplifying function declaration, Anonymous functions, High-order functions Classes: Properties, Class functions and encapsulation-Interoperability	3	10%

2.	**Building User Interfaces** Introduction to layouts, introduction to fragments, introduction to adapters. Introduction to ViewBinding and DataBinding. **Intents and Broadcast Receivers** Introduction to intents and broadcast receivers.	**5**	**17%**
3.	**Files, Saving State** Working with the File System- Access Files from SD card and introduction to Scoped Storage. **Database** Introduction to SQLite Databases, Introduction to Room DB **Content Providers** Native ANDROID Content Providers	**8**	**26%**
4.	**Working in background** Introducing Work Manager **Enhancing user experience** Introduction of Action Bar, Menus and Dialogs, Drawables and Gradients, Custom Animations.	**5**	**17%**
5.	**Audio, Video and Using the Camera** Playing Audio, Using Camera to take pictures, introducing Telephony API, introducing SMS and MMS **Monetizing, promoting and distributing the applications** Signing and publishing applications, distributing applications, introduction to monetizing applications.	**4**	**14%**
6.	**Web Services (Only for implementation in lab)** Introduction to Web services. How to call web services in Android, Android JSON web services.	**5**	**16%**

Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
20	20	10	15	15	20

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels **(Revised Bloom's Taxonomy)**

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Head First Android Development	Dawn Griffiths, David Griffiths	O'Reilly Media, Inc.	2021	3rd
2	Android Programming with Kotlin for Beginners	John Horton	Packt Publishing	2019	1st

Course Outcome:

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	Understand the concept of open source Android Mobile Application using Kotlin development and Android architecture framework.	10
CO-2	Ability to create Android UI Layout, Broadcast receiver.	17
CO-3	Ability to create Files, Scoped Storage, Database and Content Providers.	26
CO-4	Ability to perform event driven programs and applications using Work Manager, Action Bar, Menus, Dialogs, Drawables and Animation.	17
CO-5	Understand the stepwise procedure to upload an Android app on Google Play store. Ability to perform event driven program on playing audio, accessing camera, telephony, SMS.	14
CO-6	Ability to create Web service based Android Mobile Application using JSON based web services.	16

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO-1	0	3	0	0	0	0	0	0	0	0	0	0			
CO-2	0	3	3	0	2	0	0	0	0	0	0	0			
CO-3	0	3	3	0	2	0	0	0	0	0	0	0			
CO-4	0	3	3	0	2	0	0	0	0	0	0	0			
CO-5	0	3	0	0	0	0	0	0	0	0	0	0			

CO-6	0	3	3	0	2	0	0	0	0	0	0	0			
Rationale*															

Rationale*: Explaining why it is matching this particular program outcome

LIST OF PRACTICALS:

1. Create a New Application with Activity, design the layout in XML res\layout\activity_main.xml, also design the String References and Values res\values\string.xml and run the application.
2. Create an application that will display "Have a GOOD Day" in the middle of the screen in the Green color with Yellow background.
3. Create an application that designs a layout with an Edittext and button named Submit. The user should enter the text in the text box. When the submit button is clicked then the text in the text box should be displayed in the toast.
4. Create an application with the login module, which will check username and password. On successful login, go to the next screen. And on failing login, alert users using Toast. Also pass username to next screen.
5. Create an application to demonstrate Android Activity Lifecycle.
6. Create an application to demonstrate View Binding and Data Binding.
7. Write an android program to call specific entered numbers by user in the Edit Text.
8. Create an application that will display a list of android versions (eg: cupcake, donut, eclair, froyo and so on) in one fragment and on selecting one android version, a second fragment should be displayed with the selected android version and its image.
9. Understanding widgets: write an android program to create Registration Activity with following detail:
    a) User Name
    b) Address
    c) Date of Birth
    d) Gender
    e) Hobbies
    f) Submit Button. On the Click of submit button the Data should be displayed on Next Activity.
10. Understand resource folder & Adapter:
    a) Create two spinners with strings taken from a resource folder (res >> value folder) and TextView.
    b) First Spinner should have a font name and Second Spinner should have font size.
    c) On changing spinner value, the font name and font size of text view value should change accordingly.
11. Write an application to demonstrate WorkManager.
12. Create an android application with an option menu with following options:
    a) Read a File (Will read file from SD card)

b) Write into File (Will write the content to file stored in SD card).

13. Create an application that will accept Employee details like empid, empname, emp department, emp address, emp salary and a button name submit. When a user clicks on submit button data should be added to the database. Design a layout which displays current record and previously added record in a tabular manner.
14. Create an application to demonstrate Room Database.
15. Create an application to practically implement the native content providers.
16. Create an application to implement Action bar.
17. Write an application to demonstrate drawable, gradient and custom animation in android.
18. Create an android application to make a call on a specified number.
19. Write a code snippet to send SMS on a specified number.
20. Write code to read SMS.
21. Create an application to play audio files from the SD card.
22. Create an application to click a picture using native camera.
23. Create an application to demonstrate calling of web service in android.

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2	Android Programming with Kotlin for Beginners	John Horton	Packt Publishing	2019	1st

List of Open Source/learning website:
https://developer.android.com/courses/android-basics-kotlin/course
https://www.geeksforgeeks.org/a-complete-guide-to-learn-kotlin-for-android-app-development/
https://kotlinlang.org/docs/home.html

List of Open Source Software:
Android Studio