



GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Master of Computer Applications, 4th Semester

Subject Name: Mobile Computing (MC)

Subject Code: 4649303

With effective
from academic
year 2018-19

1. Learning Objectives:

- To be able to understand the process of developing software for the mobile
- To be able to create mobile applications on the Android Platform
- To be able to create mobile applications involving data storage in SQLite database.

2. Prerequisites: Knowledge of the Core Java Programming, database concepts

3. Contents:

Unit No.	Course Content	Weightage Percentage
Unit I	Introduction to ANDROID : ANDROID SDK Features, Introduction to Development Features Basics of ANDROID Developing for ANDROID, developing for mobile and embedded devices, ANDROID development tools Creating Applications using ANDROID Basics of an ANDROID application, introduction to manifest, externalizing resources, application life cycle, ANDROID activities	10%
Unit II	Building user interfaces Introduction to layouts, introduction to fragments, creating new views, introduction to adapters Intents and broadcast receivers Introduction to intents, creating intents and broadcast receivers Using Internet resources Downloading and parsing Internet resources, using the download manager, using Internet services	25%
Unit III	Files, saving state and preferences Creating, saving and retrieving shares preferences, including static files as resources, working with the file system Database and content providers Introducing ANDROID databases, content values and cursors, working with SQLite databases, creating content providers, using content providers, native ANDROID content providers	25%
Unit IV	Working in background Introducing services, using background threads, using alarms Enhancing user experience Introduction and addition of action bar, menus and dialogs, drawables and gradients, custom animations	



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	Maps and location based services (Using location based services, selecting a location provider, finding your current location, creating map based activities)	20%
Unit V	Audio, video and using the camera Playing audio and video, manipulating raw audio, using camera to take pictures, recording video, adding media to media store Telephony and SMS Hardware support for telephony, using telephony, introducing SMS and MMS Monetizing, promoting and distributing the applications Signing and publishing applications, distributing applications, introduction to monetizing applications	20%

Desirable Topics:

- 1) Navigation drawer, recycler view and material design: <https://developer.android.com>
- 2) Android 9 Overview (Kotlin)

4. Text Book:

- 1) Reto Meier Professional ANDROID 4 Application Development, WROX Latest Edition

5. Reference Books:

- 1) Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)
- 2) Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd (2009)
- 3) Sayed Y Hashimi and Satya Komatineni, "Pro Android", Wiley India Pvt Ltd (2009)

6. Chapter wise Coverage from Text Book:

Unit No	Chapters
I	Chapter 1,2,3
II	Chapter 4,5,6
III	Chapter 7,8,9
IV	Chapter 10,11,13
V	Chapter 15, 17,19

Tools/Technologies to be used:

- 1) ANDROID Studio [Latest Version]
- 2) ANDROID Version [Jelly Bean and later]

7. Accomplishments of the student after completing the course:

Student will visualize the real world mobile application scenario and enables them for development and implementation of mobile applications



Practical List

Tools/Technologies to be used:

Android or Android Studio [Latest Version]

Part 1: Mandatory

1. Installing "Android Studio IDE" and "Android SDK"

Step 0: Pre-Installation Check List

Step 1: Install "Android Studio IDE" ((For Windows), (For Mac OSX) (For Linux))

Step 2: Installing Android SDK

2. Write your First Android App

2.1 Hello-World

Step 1: Create a New Android Project

Step 2: Setup Emulator (aka Android Virtual Device (AVD))

Step 3: Run the Android App on Emulator

Step 4: Run the Android App on Real Devices

2.2 Hello-world "by Coding"

Create User Interface (UI) on Android: (1) Write Java codes; (2)

Layout via XML descriptions and let the system generates the Java

Code for you.

- **MainActivity.java**
- Dissecting the "**MainActivity.java**" - Application, Activity & View
- Android Application Descriptor File - "**AndroidManifest.xml**"
- Common Errors □ Modify

2.3 Hello-World using "XML Layout"

Step 1: Create a New Android Application

Step 2: Define the Layout in XML *res\layout\activity_main.xml*

Step 3: Defining String References and Values *res\values\string.xml*

Step 4: The Activity - "**MainActivity.java**"

Step 5: Run the App

3. Create "Hello World" application. That will display "Hello World" in the middle of the screen in the red color with white background.

4. Create an application that designs a layout with a text box 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.

5. Create an application to demonstrate Android Activity Life Cycle.

6. To understand Activity,



Intent Create sample application with login module.(Check username and password) On successful login, go to next screen. And on failing login, alert user using Toast. Also pass username to next screen.

7. Create an application that designs a layout having two text boxes user name and password. The user and password will be taken from the user. The username and password will be verified from the username and password stored in the resources folder. If the verification is successful then a new layout will appear which will open any URL in browser.

8. Create an application to call specific entered number by user in the Edit Text

9. Create an application that will show List of Countries in One fragment , and on selecting one country, second fragment should be displayed with name selected country and its flag.

10. Understanding of UI :

a. Create an UI such that, one fragment of screen have list of all the types of cars.

b. On selecting of any car name, second fragment of screen should show Car details Like: name, launched date, company name, images (using gallery) if available, show different colors in which it is available.

11. Android Program to Perform all Operations using Calculators

12. Understand resource folder & Adapter :

a. Create spinner with strings taken from resource folder (res >> value folder).

b. On changing spinner value, change image.

13. Create an application that parses given XML File.

14. Create an application that parses given JSON File.

15. Create an application that fetches foreground and background colors from User. Save it as preference. On the next screen change background color and font color based on values passed by user. If no preferences are set then use Black and White as default background and foreground color respectively.

16. Create an application that designs a layout having two text boxes user name and password. The user and password will be taken from the user. The username and password will be verified from database. If the verification is successful then a new layout will appear which will contain text "Welcome ,<UserName>" otherwise displays error message.

17. Create an application that will create database with country table(Country short Name (IND), Name). Create an application to make Insert, update, Delete and retrieve operation on the database.

18. Understanding content providers and permissions: Read phonebook contacts using content providers and display in list.

19. Android Program to Demonstrate Layouts in an Activity and Nesting of Layouts and Demonstrate List View Activity

20. Create application that works like an alarm.

21. Understand Menu option and Context Menu : Create an application that will change color of the screen, based on selected options from the menu.

22. Create an application that will have spinner with list of animation names. On selecting animation name, that animation should affect on the images displayed below.

23. Android Program to Demonstrate an Adapter and Advanced Adapter.

24. Android Program to Demonstrate Broadcast Receiver, Broadcast Receiver to Intercept Custom Intent, Pending Intent, OrderedBroadcast.

25. Android Program to Demonstrate Intent Filter, Local Broadcast Manager, to Monitoring Device State Changes Using Broadcast Intents.



26. Android Program to Open an Internet Data Stream.
27. Android Program to Parse Xml Using Xml Pull Parser, Parse Xml Using Dom Parser.
28. Android to demonstrate Download Manager in Android, Android Program to Demonstrate Connection to an Internet Resource.
29. Android Program to Demonstrate Creating and Saving Shared Preferences and Demonstrate Preference Screen and Sub-screen in a Preference Screen and Intent in Preference Screen.
30. Android Program to Demonstrate Preference Fragment, Preference Headers Preference Activity.
31. Android Program to Demonstrate Reading a File on SD Card, Reading and Writing to a File in Android and Instance Save State.
32. Create an application that will play a media file from the memory card.
33. Create an application to take picture using native application.
34. Create an application to pick up any image from the native application gallery and display it on the screen.
35. Read messages from the mobile and display it on the screen.
36. Create an application to send message between two emulators.
37. Android Program to Demonstrate Action Bar in Android, Disable the Action Bar in an Activity, Hide Title Label of Action Bar in Android, Add Actions in Action Bar, Respond to Added Actions in Action Bar in Android, Change the Displayed Text alongside the Application Icon at Runtime, Change the Background of Action Bar in Android.
38. Android Program to Demonstrate Shape Drawables, Gradient Drawables, Radial Gradient, Sweep Gradient in Android.

Part 3: Advanced (Mandatory)

39. Create an application that designs a layout having a rating bar. Whenever user gives the rating then a dialog box should appear with a message and button OK. The message in the rating bar should be displayed (e.g.: 1.5 rating selected) 'You have given 1.5 Rating'. When button OK is pressed than the dialog box should disappear.
40. Create an application that designs a layout to take contact label (name) and phone no from the user and store in the contacts using content provider. Also design a layout to read phone contacts stored using content provider and display contact label (name) in list view. When the user selects any contact label (name) from the list view dialer application should be launched and call should be made using dialer application.
41. Create an application that designs a layout with spinner and an image view. The spinner should contain various shapes like circle, rectangle and rounded rectangle. When a shape is selected from the spinner that shape should be drawn in the image view. (Hint: Use shape Drawable or xml files for shapes on image view)
42. Create an application that designs a layout containing a list view having options:
 - a. Create file
By clicking on first option Create file a new layout should be displayed having two text boxes file name and file data and one button save. Both file name and data of the file should be entered by the user and on clicking save the file should be saved and proper message should be displayed on saving a file.
 - b. Delete file



By clicking on second option delete file a new layout should be displayed having one text box file name and one button delete. The file name should be entered by the user and on clicking delete the file should be deleted and proper message should be displayed on deleting a file.

c. Display File.

By clicking on third option display file a new layout should be displayed having one text box for file name and one text view for file data and one button display. The file name should be entered by the user and on clicking the display button the contents of the file should be displayed in text view.

43. Create an application that designs a layout with 3 text boxes and an options menu. The options menu should contain options like Simple Interest and compound Interest. The text boxes should be used for the input of information like the principle amount, rate of interest and number of years. Then clicking on the option from menu appropriate operation should be performed and correct result should be displayed.

44. Create an application that designs a layout having text boxes and button submit. The details of doctor like doctor's first name, last name, mobile number, address, city and specialization should be entered by the user in the textboxes and on clicking on the button submit the data should be saved into the database. Create another layout that contains a text box, a button search and a text view that gives searching facility. User can search doctor's full information by providing doctor's name in the text box. On clicking on button search the information of the doctor should be displayed in text view.

Doc_detail (doc_id, firstname, lastname, mob, add, city, specialization)

45. Create an application that designs a layout with a list view and fetches the audio files stored in the SD Card. The names of the Audio files should be displayed in the list view. When the user clicks on the specific file name the title and duration of the audio should be displayed in the next layout.

46. Create an application that designs a layout having gallery of images and an image view. The gallery contains number of images. Whenever an image is selected from the gallery it should be displayed in the image view. The images should be fetched from the resources folder. (You can take any readymade image available or you can create your own)

47. Create an application that designs a layout having options menu and 2 text boxes for currency converter which allows user to select a particular conversion from following options.

- a. Rupees to dollars
- b. dollars to Rupees
- c. Rupees to pound
- d. Pound to Rupees

The data for conversion should be entered by the user in textbox. Then clicking on the option from menu appropriate operation should be performed and correct result should be displayed.

48. Create an application that designs a layout which provides field for enrollment number (text box), student's name (text box), course (radio buttons), semester (radio buttons) and marks for sub1 (text box), sub2 (text box), sub3 (text box) and a button name submit. When user clicks on submit button data should be added to database. Design a layout which displays current record and previously added record in a tabular manner. Total should be calculated automatically and then stored into the database.



Stud_marks(en_no, stud_nm, course, sem, sub1, sub2, sub3, total)

49. Create an application that designs a layout having a list view having two options:

a. Add contacts

On selection of the first option a new layout should be displayed containing two text boxes name and phone no and a button save. The name and phone no should be entered by the user and on clicking the save button the contact should be saved in the contacts directory and appropriate message should be displayed.

b. Display contacts.

On selection of second option display contacts a new layout should be displayed with list view and all the names from the contacts should be fetched and displayed in the list view.

(Hint: Use Contacts Contract Content Provider).

50. Create an application that designs a layout of a student registration form. The layout should contain fields like first name, last name, phone no, date of birth (use date control) gender (use radio buttons), hobbies (use check boxes) and a button register. On clicking register an alert dialog box should appear with a message “do you want to register” and with two buttons yes or no. If yes is clicked then a new layout should appear where all the entered details should be displayed and also calculate the age (in years only) of the student and display it. If no is clicked than the alert dialog box should disappear.

51. Create an application that designs a layout for making an Admission Form. The layout should contain details like student enrollment no (textbox), Sem (spinner), Course (spinner), Date (date control), DOB (Date picker), SSC marks (textbox), HSC Marks (spinner), CMAT Score (Textbox) and a button named Submit. When the button submit is clicked than a new layout should be opened that displays all the student details as a summary and also display Merit Score. Merit Score should be calculated when the submit button is clicked.

Merit score = Average of (SSC marks, HSC Marks, CMAT score)

52. Create an application that designs a layout to store Result Details for MCA. The layout must contain details like name (textbox), Sem 1 Marks(spinner), Sem 2 Marks(spinner), Sem 3 Marks(spinner) , Sem 4 Marks(spinner), Sem 5 Marks(spinner) , Sem 6 Marks(spinner) and a Button named Submit.

Note: Marks must be from (AA, AB, BB, BC, CC and FF)

When the submit button is selected all the details should be saved in the database. Also provide a layout to perform the following operations:

a. Update the Marks /grade.

b. Search the Students on basis of his marks / grade.

53. Create an application that designs a layout to store Student Details. The layout should contain information like: Roll number (textbox), Name (textbox), Birth date (Date Picker), Marks1 (textbox), Marks2 (textbox), Marks3 (textbox) and button submit. When button submit is clicked than all the details must be saved in the database. Also percentage and total should be calculated automatically and saved into the database. Also design a layout to perform following operations:

a. Update Any student's marks



- b. Search the student details by roll no
- c. Delete any student by roll no

- 54. Create an application to implement shopping cart.
- 55. Create an application to provide feedback using text and rating(do not use text box).

Part 4: Desirable

- 56. Create an application that creates an XML file with <Customer> as main tag. The structure of XML file should be as follows:

```
<Game>  
< Game -id> </ Game -id>  
< Game -name> </ Game -name>  
< Game -price> </ Game -price>  
</ Game>
```

Design a layout containing a list view which fetches all the Game names in the list view. When the user selects any particular Game name than a new layout should be displayed with a text view and all the information regarding that Game should be fetched from the XML file and displayed in the text view

- 57. Android Program to Demonstrate Material View Design.
- 58. Android Program to Demonstrate Recycler view.
- 59. Android Program to Demonstrate Navigation Drawer, Navigation Using Fragments, adding actions to Navigation Bar in Android, Navigation Drawer with Different Fragments in Android, Tab Navigation in Android, Drop down Navigation in Android.

Note: Some of the practicals form the above practical list may have seemingly similar definitions. For better learning and good practice, it is advised that students do maximum number of practicals. In the practical examination, the definition asked need not have the same wordings as given in the practical list. However, the definitions asked in the exams will be similar to the ones given in the practical list.