GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Master of Computer Applications, 2nd Semester
Subject Name: Mobile Computing using Android
Subject Code: 629402

With effective from academic year 2020-21

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
I	**Basics of ANDROID** Introduction to ANDROID: ANDROID SDK Features, Introduction to Development Features 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 lifecycle, ANDROID activities	**10%**
II	**User Interface in Android** 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%**
III	**Working with Data in Android** 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%**

	Working in background Introducing services, using background threads, using alarms	
IV	**Enhancing user experience** Introduction and addition of action bar, Creating and using menus and Action bars action menus, introducing dialogs, let us make toast, Introducing notifications, **Advanced User experience:** Designing for every Screen size and density, Introducing Android Text-to speech, Using speech recognition, Controlling Device vibration, Working with Animations, Enhancing your views, Advanced Drawable resources, Copy, paste and the clipboard.	**15%**
V	**Advanced Android** **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	**15%**
VI	**Publishing your App:** Monetizing, promoting and distributing the applications, Signing and publishing applications, distributing applications, introduction to monetizing applications	**10%**
VII (*)	**Web Services (Only for implementation in lab)** **Introduction, Web services Types, Consuming Web Services, Performance** **Case Study:** Simple Android Web service, How to call Java web services in Android, Android JSON or XML web services, Authenticate users using web service	-

(*) Unit 7 is only for Practical implementation in App development.

Desirable Topics:

1) Navigation drawer. recycler view and material design: https://developer.android.com
2) Performance Improvement of App, Location services, Google maps API, Google Places API
3) Android 9 Overview (Kotlin)

4. Text Book:

1. Reto Meier, Professional ANDROID 4 Application Development, WROX Latest Edition
2. Nolan Godfrey, Onur Cinar, David Truxall, Android Best Practices, A press

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)

Web references

- https://developer.android.com/index.html
- Android Developer Fundamental Course by Google and Advance Android Developer Course by Google (https://developer.android.com/courses)

6. Chapter wise Coverage from Text Book:

Unit No	Book#	Chapters
1	1	Chapter 1,2,3
2	1	Chapter 4,5,6
3	1	Chapter 7,8,9
4	1	Chapter 10,11
5	1	Chapter 15, 17
6	1	Chapter 19
7	2	Chapter 8

Tools/Technologies to used be:

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

8. Suggestions for Lab Sessions: (Group Activity)

General Guidelines

1. Group: 2-3 Person.
2. The project should be free from plagiarism of any kind.
3. It is mandatory that the project should be developed using Android Studio 2 later version on Linux or Windows Platform.
4. This may not be a live project

B. Expected Outcome

- The objective of the Mobile Application development using Android is to make students aware about the industry based process and workings. As a result, Application must meet with the industry standards.
- There will not be any compulsion to prepare a project report for the students but an application should be demonstrated, so that evaluator may get the detail about the Project developed and can evaluate the students as per the evaluation criteria.
- Each group to develop 2 applications with minimum features describe as below:
  - **Sample Definition for Simple Application:**
    - **Learning objective:** Idea is to make students learn the basic of android by imitating the apps that are easy to build and uses some logic

    1. Number Guessing Game [User will guess a number from 1 to 100 and will be compared with random number generated]
    2. This can be extended to store the score in file [+1 to score if number matches]
    3. Dice Rolling Game [Random generating numbers and displaying image like dice]
    4. Simple Calculator [This can be extended to save the whole calculation sequence so that it can be rechecked]
    5. To-Do List App [Storing and reading file]
    6. Timer [This can be extended to store last 10 timer details]
    7. Daily Diary [To store the date and description to write daily experience]
    8. Daily Motivational Thought / Article [Fetching the article for Wikipedia, thought from some site or file]

    Advanced Application 2: Web service Based

    - Patient Appointment App,
    - Movie Ticket Booking
    - Cab Booking Android Application
    - ST Bus Ticket Booking
    - Vehicle tracking system
    - Attendance System
  - More project definition can be found at https://nevonprojects.com/project-ideas/android-project-ideas/.

Evaluation

Sr. No.	Particulars	Weightage
1	**Application – 1 Simple**	**20%**
2	**Application – 2 – Advanced**	**30%**
3	**Code changes for Application – 2**	**30%**
4	**VIVA**	**20%**

Preferably application may be uploaded on app store