

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

**COURSE CURRICULUM
COURSE TITLE: MOBILE COMPUTING AND APPLICATION
DEVELOPMENT
(COURSE CODE : 3360704)**

Diploma Program in which this course is offered	Semester in which offered
Computer Engineering	SIXTH

1. RATIONALE

The objective of Mobile computing and Android Apps Development is to make students attentive about how mobile communication works and how to build mobile apps for android mobile operating System. This course covers the necessary concepts which support mobile application development.

2. COMPETENCIES

The course content should be taught and implemented with the aim to develop different types of skills so that students are able to acquire following competencies:

- Design, Develop and launch basic open source mobile application

3. COURSE OUTCOMES:

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

- Explain mobile technology
- Demonstrate Android activities life cycle
- Execute operations on GUI objects
- Perform Event driven programming
- Apply various techniques on working with menu

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	
3	0	4	7	70	30	40	60	200

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit; ESE - End Semester Examination; PA - Progressive Assessment

5. COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – I Introduction to Mobile Computing	1a.Explain brief Introduction to Mobile technology and generations 1b.Define and explain characteristics of GSM and CDMA	1.1 Concept of Mobile Communication 1.2 Different generations of wireless technology 1.3 Basics of cell, cluster and frequency reuse concept 1.4 Noise and its effects on mobile 1.5 Understanding GSM and CDMA 1.6 Basics of GSM architecture and services like voice call, SMS, MMS, LBS, VAS
Unit – II Introduction to Android	2a. Analyze Open source mobile technology, Explain Basics of Application development 2b. Explain Framework, SDK, Emulation	2.1 Overview of Android 2.2 Open Handset Alliance 2.3 What does Android run On – Android Internals? 2.4 Why Android for mobile apps development? 2.5 Environment setup for Android apps Development 2.6 Framework - Android- SDK, Eclipse 2.7 Emulators – What is an Emulator / Android AVD? 2.8 Android Emulation – Creation and set up 2.9 Android Project Framework 2.10 First Android Application
Unit – III Android Activities and GUI Design concepts	3a. Define and Explain Android Activities lifecycle and UI Layout, Expressions, Manifest, other necessary UI concept 3b.List GUI Objects, Layout Design concepts	3.1 Intent, Activity, Activity Lifecycle and Manifest 3.2 Creating Application and new Activities 3.3 Expressions and Flow control, Android Manifest 3.4 Simple UI -Layouts and Layout properties <ul style="list-style-type: none"> • Introduction to Android UI Design • Introducing Layouts • Creating new Layouts • Draw able Resources • Resolution and density independence (px,dip,dp,sip,sp) 3.5 XML Introduction to GUI objects viz. <ul style="list-style-type: none"> • Push Button • Text / Labels • EditText • ToggleButton • WeightSum • Padding • Layout Weight
Unit – IV Advanced UI Programming	4a. Explain Android Event driven Programming, Splash screen, Activity Lifecycle, Exception handling	4.1 Event driven Programming in Android (Text Edit, Button clicked etc.) 4.2 Creation of a splash screen 4.3 Activity Lifecycle of Android 4.5 Creating threads for gaming requirement 4.6 Exception handler
Unit – V Toast, Menu,	5a.Perform Working with menu and dialog, Themes,	5.1 Menu :Basics, Custom v/s System Menus, Create and Use Handset menu Button (Hardware) 5.4 Android Themes

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Dialog, List and Adapters	Dialog 5b.Perform Demo Application Launching 5c Perform Database operation	5.5 Dialog : Creating and Altering Dialogs 5.5 Toast : List & Adapters 5.6 Manifest.xml File Update 5.7 Demo Application Development and Launching 5.8 Basic operation of SQLite Database

6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction to Mobile technology	8	4	4	2	10
II	Open source Android technology	10	6	8	6	20
III	Android activities and UI Programming	8	4	6	6	16
IV	Advanced event driven programming	8	2	4	6	12
V	Toast, Menu, Dialog, List and Adapters	8	2	4	6	12
	Total	42	18	26	26	70

Legends: R = Remembrance; U = Understanding; A = Application 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.

7. SUGGESTED LIST OF EXERCISES/PRACTICAL

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills (**outcomes in psychomotor and affective domain**) so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of **Course Outcomes** related to affective domain. Thus over all development of **Programme Outcomes** (as given in a common list at the beginning of curriculum document for this programme) would be assured.

Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.

Example Practical list is followed with this suggested list of exercises

Sr. No.	Unit No.	Practical Exercises	Hrs. Required
1	II	Create “Hello World” application. That will display “Hello World” in the middle of the screen in the red color with white background.	4
2	III	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.	4
3	III	Create login application where you will have to validate EmailID (UserName). Till the username and password is not validated , login button should remain disabled.	2
4	III	Create and Login application as above . On successful login , open browser with any URL.	2
5	III	Create an application that will pass some number to the next screen , and on the next screen that number of items should be display in the list.	4
6	III	Create spinner with strings taken from resource folder(res >> value folder). On changing spinner value, change image.	4
7	III	Create an application that will change color of the screen, based on selected options from the menu.	4
8	IV	Create an application that will display toast (Message) on specific interval of time.	4
9	IV	Create a background application that will open activity on specific time.	4
10	IV	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.	4
11	IV	Create an UI such that, one screen have list of all the types of cars. On selecting of any car name, next screen should show Car details like: name, launched date, company name, images (using gallery) if available, show different colors in which it is available.	4
12	V	Understanding content providers and permissions: Read phonebook contacts using content providers and display in list.	4
13	V	Create an application to call specific entered number by user in the Edit Text	4
14	V	Create an application that will create database with table of User credential.	4
15	V	Create an application to make Insert, Update, Delete and retrieve operation on the database.	4
Total Hours			56

8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities such as:

- i.Design sample GUI
- ii.Presentation on mobile technology
- iii.Seminar on Open Source Technology

9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

- i. Faculty should demonstrate an Open source technology specifically java and should give some clear understanding of mobile technology using some simulation or pictorial representation.

10. SUGGESTED LEARNING RESOURCES

A) List of Books

Sr. No.	Title of Book	Author	Publication
1	Professional Android 2 Application Development	Reto Meier	Wiley India Pvt Ltd
2	Beginning Android	Mark L Murphy	Wiley India Pvt Ltd
3	Pro Android	Sayed Y Hashimi and Satya Komatineni	Wiley India Pvt Ltd

Suggested Readings:

- i. Android Studio Development Essentials by Neil Smyth
- ii. The Definitive Guide to SQL Lite by Michael Owens

B) List of Major Equipment/ Instrument with Broad Specifications

- i. **Hardware:** Necessary Kits or Environment to briefly introduce mobile technology environment like GSM, CDMA and GSM services, Computer with latest configuration
- ii. **Software:** Java, Netbeans, Eclipse, Android SDK (open source)

C) Additional Resources of MIS that can be used for conducting Practical as well as case studies

- i. <http://www.tutorialspoint.com/android/>
- ii. http://www.tutorialspoint.com/android/android_overview.htm
- iii. <http://www.codelearn.org/android-tutorial/android-introduction>
- iv. <http://pl.cs.jhu.edu/oose/resources/android/Android-Tutorial.pdf>
- v. <http://mobisys.in/blog/2012/01/introduction-to-android-sqlite-database/>

11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof. P. P. Kotak**, H. O. D Computer Department, A. V. P. T. I., Rajkot
- **Prof. R. M. Shaikh**, H.O.D Computer Department, K. D. Polytechnic, Patan
- **Prof. K. N. Raval**, H.O.D Computer Department, R. C. Technical Institute, Ahmedabad
- **Prof. S. R. Solanki**, Lectuer Computer, Government Polytechnic, Dahod
- **Prof. R. B. Pancholi**, Lectuer Computer, L. J. Polytechnic, Ahmedabad.
- **Prof. J. L. Vyas**, Lectuer Computer, L. J. Polytechnic, Ahmedabad.

Coordinator and Faculty Members from NITTTR Bhopal

- Dr M A Rizvi, Associate Professor, Dept. Of Computer Engineering and Applications, National Institute of Technical Teachers' training and Research, Bhopal.
- Dr R K Kapoor, Associate Professor, Dept. Of Computer Engineering and Applications, National Institute of Technical Teachers' training and Research, Bhopal.