GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM
COURSE TITLE: ANDROID APP DEVELOPMENT
(COURSE CODE: 3361602)

Diploma Program in which this course is offered	Semester in which offered
Information Technology	SIXTH

1. RATIONALE

Android application development course is designed to enable the diploma information technology students to build mobile applications on most popular mobile operating system of today. This course covers the basics of Android along necessary programming codes for developing necessary programming skills for mobile applications.

2. COMPETENCIES

The course content should be taught and implemented with the aim to develop skills to enable the students acquire following competencies:

- Set up the Android OS development platform, develop the open source mobile operating system, develop Android applications using Eclipse Android SDK on open source and propriety O.S platforms.
- Develop GUI , connect database with android applications for mobile smartphone devices.

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.

- Understand the concept of Open Source mobile development
- Describe Android architecture framework
- Design Android UI Layout
- Develop event driven Programs
- Develop application with menus and dialog boxes

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	200
3	0	4	7	70	30	40	60	

5.   COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – I **Android OS :Concepts**	1a. Explain the concept of Open source mobile technology	1.1 Mobile technology : Overview of Android - An Open Platform for Mobile development 1.2 Open Handset Alliance 1.3 Use Android for mobile development 1.4 Android Marketplaces 1.5 Android Development Environment setup 1.6 Android development Framework - Android-SDK, Eclipse Emulators / Android AVD. 1.7 Creating & setting up custom Android emulator 1.8 Android Project Framework and its applications
Unit II **Android Architecture**	2a Describe Android architecture framework	2.1 Linux Kernel 2.2 Libraries 2.3 Android Runtime 2.4 Application Framework 2.5 Applications 2.6 Android Startup and Zygote 2.7 Android Debug bridge 2.8 Android Permission model
Unit – III **Android Activities and UI Design**	3a. Design Android UI Layout	3.1 Android application components Intent**,** Activity, Activity Lifecycle, Broadcast receivers, Services 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 • Fundamental Android UI Design • Introducing Layouts • Creating new Layouts • Drawable Resources • Resolution and density independence (px,dip,dp,sip,sp)
	3b. Use GUI Objects to develop applications	3.5 XML Introduction to GUI objects viz. • Push Button • Text / Labels • EditText

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
		• ToggleButton • WeightSum • Padding • Layout Weight
Unit – IV **Advanced UI Programming**	4a. Develop event driven Programming in Android	4.1 Event driven Programming in Android (Text Edit, Button clicked etc.) 4.2 Creating a splash screen 4.3 Android Activity Lifecycle 4.4 Introduction to threads in Android
Unit – V **Toast, Menu, Dialog, List and Adapters**	5a. Develop application with menus and dialog boxes	5.1 Menu: Custom Vs. System Menus 5.3 Creating and Using Handset menu Button (Hardware) 5.4 Android Themes, Dialog, create an Alter Dialog 5.5 Toast in Android, List & Adapters 5.6 Android Manifest.xml File Update
Unit - VI **Working with Database**	6a. Develop applications with database	6.1 SQLite: Open Helper and create database 6.2 Open and close a 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	Android OS: Concepts	06	4	4	2	10
II	Android Architecture	06	4	4	2	10
III	Android Activities and UI Design	10	4	7	7	18
IV	Advanced UI Programming	10	4	2	4	10
V	Toast, Menu, Dialog, List and Adapters	08	4	4	6	14
VI	Work with Database	04	2	4	2	08
	Total	**42**	**22**	**25**	**23**	**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.	Practical Exercises	Hrs. Required
1	Create "Hello World" application to "Hello World" in the middle of the screen in the red color with white background.	4
2	Create sample application with login module.(Check username and password), validate it for login screen or alert the user with a Toast.	4
3	Create and validate a login application using username as Email ID else login button must remain disabled.	2
4	Create and Login application and open a browser with any one search engine.	2
5	Create an application to display "Hello World" string the number of times user inputs a numeric value. (Example. If user enters 5, the next screen should print "Hello World" five times.)	4
6	Create spinner with strings from the resource folder (res >> value folder). On changing spinner value, change image.	4
7	Create an application to change screen color as per the user choice from a menu.	4
8	Create an application that will display toast (Message) at some regular interval of time.	4
9	Create a background application that will open activity on specific time.	4
10	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	Create an UI listing the diploma engineering branches. If user selects a branch name, display the number of semesters and subjects in each semester.	4
12	Use content providers and permissions by implementing read phonebook contacts with content providers and display in the list.	4
13	Create an application to call a phone number entered by the user the Edit Text.	4
14	Create an application that will create database to store username and password.	4
15	Create an application to insert, update and delete a record from 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.Present the developed application on a mobile device

iii.Present paper in a 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	Professional Android	Sayed Y Hashimi and Satya Komatineni	Wiley India Pvt Ltd

Suggested Readings

1. Android Studio Development Essentials by Neil Smyth

2. The Definitive Guide to SQL Lite by Michael Owens

B) List of Major Equipment/ Instrument with Broad Specifications

- Computer System with latest configuration
- Internet
- Open Source Software
- Android Open Source Project, Android SDK, Eclipse Environment

C) Additional Resources of Android that can be used for conducting Practical as well as case studies
http://developer.android.com/tools/sdk/eclipse-adt.html
developer.**android**.com/sdk/installing/installing-adt.html
https://www.**eclipse**.org/downloads/

11.   COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- Parvez Faruki, I/C Head and Lecturer, IT, Sir BPTI Bhavnagar
- Amit Shah, Lecturer, Information Technology, L.J Polytechnic, Ahmedabad
- Nandu Fatak, Lecturer, Information Technology, Sir BPTI, Bhavnagar.

Coordinator and Faculty Members from NITTTR Bhopal

- **Dr. Sanjay Agrawal,** Professor, Department of Computer Engineering and Applications, NITTTR, Bhopal
- **Prof. Shailendra Singhm** Professor, Computer Engineering, NITTTR Bhopal.