GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

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

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

1. RATIONALE

Mobile Application development is becoming need of the day as webpage development was about ten years ago. Most companies are developing their mobile applications so that customers may interact with them on mobiles itself. Android is most popular mobile operating system of today. Android application development course is therefore designed to enable the diploma information technology students to build mobile applications on this platform. This course covers the basics of Android along with required programming codes for developing necessary programming skills for mobile applications. Thus this course is an important course for IT students with possibilities of self employment.

2. COMPETENCY

The course content should be taught and implemented with the aim to develop required skills in the students so that they are able to acquire following competency:

- **Develop GUI based mobile applications with Eclipse Android SDK on open source Android and propriety platforms with database connectivity.**

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 frame work.
- Design Android UI Layout
- Develop event driven programs.
- Develop applications using 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	

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 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 app 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	2aDescribe 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 2.9 Android Manifest File
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 Create 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,dp,sp)
	3b. Use GUI Objects to develop applications	3.5 XML Introduction to GUI objects viz. • Push Button • Text / Labels • EditText • ToggleButton • WeightSum • Padding

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
		• 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
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	04	4	4	2	10
II	Android Architecture	06	6	4	2	12
III	Android Activities and UI Design	10	4	5	7	16
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.

S. No.	Unit	Practical Exercises (outcomes in psychomotor domain)	Approx. Hours Required
1.	I	Create "Hello World" application to "Hello World" in the middle of the screen in the red color with white background.	4
2.	II	Create sample application with login module.(Check username and password), validate it for login screen or alert the user with a Toast.	4
3.	II	Create and validate a login application using username as Email ID else login button must remain disabled.	2
4.	III	Create and Login application and open a browser with any one search engine.	2
5.	III	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.	III	Create spinner with strings from the resource folder (res >> value folder). On changing spinner value, change image.	4
7.	III	Create an application to change screen color as per the user choice from a menu.	4
8.	III	Create an application that will display toast (Message) at some regular 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 listing the diploma engineering branches. If user selects a branch name, display the number of semesters and subjects in each semester.	4
12.	V	Use content providers and permissions by implementing read phonebook contacts with content providers and display in the list.	4
13.	V	Create an application to call a phone number entered by the user the Edit Text.	4
14.	VI	Create an application that will create database to store username and password.	4
15.	VI	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.
ii. Concepts should be introduced in classroom input sessions and by giving demonstration through projector.
iii. Arrange expert lectures by IT experts working professionally in the area of applications development.
iv. More focus should be given on practical work which will be carried out in laboratory sessions. If possible some theory sessions may be conducted in labs so that theory and practice can go hand in hand.
v. Faculty should allow students to use their creativity and let them struggle to learn on their own during practical sessions. However, faculty should remain around the students and should help them when they are stuck.
vi. Arrange an application development competition by making groups of four students each and award the winning group. Give publicity to this competition at institute/city level.

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

- Developing Andriod Apps- Udacity https://www.udacity.com/course/ud853
- Build your firs App http://developer.android.com/training/basics/firstapp/index.html
- Android App Development Tutorial http://www.codelearn.org/android-tutorial
- ADT Plugin http://developer.android.com/tools/sdk/eclipse-adt.html
- Installing the Eclipse Plugin http://developer.android.com/sdk/installing/installing-adt.html
- Eclipse Download 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

Coordinator and Faculty Members from NITTTR Bhopal

- **Dr. K. James Mathai,** Associate Professor, Department of Computer Engineering and Applications.
- **Dr. Priyanka Tripathi,** Associat**e** Professor, Department of Computer Engineering and Applications.