



GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering

Subject Code: 3735405

Semester – III

Subject Name: MOBILE PHONE APPLICATION DEVELOPMENT

Type of course: Professional Elective-V

Prerequisite: Basic knowledge of Linux kernel and object oriented programming

Rationale:

Android is an open source platform built by Google that includes an operating system, middleware and applications for the development of devices employing cellular communications. As android based applications are highly used in many embedded systems, embedded engineer should learn to develop a mobile applications with android. .

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
2	0	2	3	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Introduction to Java and Embedded Android Java fundamentals; Classes and objects; Inheritance, polymorphism and interfaces, APIs – Linux Kernel – Android Hardware Support – Android Native User-Space – Android System Services – Development Host Setup – AOSP – Building and Running AOSP – Android System Architecture – Memory Layout and Mapping – Development Setup	12	25 %
2	Android OS Introduction to Android, Introducing Development Framework, Dalvik Virtual Machine – DVM, Android Virtual Device and SDK Manager, Android Architecture and OOPS, Android Development Tools, Android Debug Bridge	08	20%



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3	Building application with Android Android Layouts, Android UI, Android GUI Architecture, Layouts, Android Widget Toolbox, Understanding Android Menus, Intents and Processes, Graphics Animation and Multimedia, Introduction to Audio on Android, Introduction to Video, Android Persistence, Android Preferences, Using File system, Accessing SD cards, Location and maps, Creating and Using Overlays, Projections, Using Wake Locks, Inter process Communication, Internet Services, Broadcast receivers, Using Camera, Sensor Manager, Bluetooth, Network, Wi-Fi, Services and Content Providers, Near Field Communication, Gesture input	18	45%
4	Database Connectivity SQLite Database, SQLite Data Types, Cursors and Content Values, SQLite Open Helper, Adding, Updating and Deleting Content	4	10%
	Total	42	100%

Reference Books:

1. Karim Yaghmour, "Embedded Android", O'Reilly Media Publication, ISBN : 978-1-4493-0829-2
2. Wallace Jackson, "Android Apps for Absolute Beginners", 2nd Edition, Apress Publications, ISBN1 3: 78-1-484200-20-9
3. Jeff Friesen, "Learn Java for Android Development", 2nd Edition, Apress Publications, ISBN 1 3: 978-1-4302-6454-5
4. Ziqurd Mednieks, Laird Dornin, G. Black Meike, Masumi Makamura , "Programming Android", O'Reily Media Publication, ISBN: 978-1-4493-8969-7

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Learn Java and embedded Android	15
CO-2	Understand basic concepts of Android Programming	20
CO-3	Build mobile application with Android	35
CO-4	Learn database connectivity	30



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List of Experiments / Tutorial :

EXP. NO.	NAME OF THE EXPERIMENT
1.	Installing Android Machine
2.	Creating a simple “Hello World” application
3.	Adding an action bar to android app to make application interactive
4.	Build user interfaces using Views, Menus and Notifications
5.	Saving key-value pairs of simple data types in a shared preferences file and saving arbitrary files in Android's file system.
6.	Handle file operations in Android application program.
7.	Build an android application with multiple screens.
8.	Learning Android Emulator to emulate android apps on various devices.
9.	Use of Intents to perform basic interaction with apps.
10.	Using Android styles and themes to make application
11.	Learn to use Android Debug Bridge to debug system and application

Design based Problems (DP)/Open Ended Problem:

1. Create Android apps that share data between apps and devices. Copy link location and save in text file.
2. Create Android apps to manage audio playback, capture picture. Create an audio recorder and video recorder.
3. Create app to add location-aware features to app by getting the user's current location. Get location of user periodically and save into file with timestamp.
4. Build an Application which keeps the record of total time of Activity displayed on the screen since it has been installed on the device.
5. Create android chat app to communicate via Bluetooth.
6. Create app to operate robot motions via Bluetooth communication.
7. Install android on embedded board like Beaglebone black.

List of Software:

Eclipse, Java, Android Studio

Learning website:

<https://developer.android.com/sdk/index.html>