Gyanmanjari Innovative University

Course Syllabus
Gyanmanjari Diploma Engineering College
Semester-5 (Diploma)

Subject: Mobile Application Development using Android - DETCE15219

Type of course: Minor (Stream)

Prerequisite: Basic Knowledge of OOPs and Core Java Language.

Rationale:

In today's digital age, the number of smartphone and tablet users is rapidly increasing, making mobile application development a critical and in-demand skill. Android, being an open-source platform, provides a significant advantage for developers by offering flexibility, scalability, and a vast user base. This course is designed to equip students with the skills and knowledge required to develop Android applications, enabling them to create real-world solutions. As smartphones and mobile applications continue to evolve, the demand for professionals skilled in Android app development is expected to rise. This course provides hands-on experience in designing, developing, testing, and deploying mobile applications, ensuring that students gain practical exposure to industry-relevant tools and technologies. By integrating theoretical knowledge with practical implementation, students will develop core competencies in mobile application development, preparing them for career opportunities in this growing and dynamic industry. This course serves as a foundation for aspiring developers to build innovative applications, enhance their programming expertise, and contribute to the ever-expanding world of mobile technology.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
				Theory Marks		Practical Marks		CA	
CI	T	P	C	ESE	MSE	V	P	ALA	
0	0	4	2	0	0	10	40	50	100

Legends: CI-ClassRoom Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Course Content:

Sr. No	Course Content	% Weightage
1	**Introduction, installation and configuration of Android** Introduction to Android, Open Handset alliances, Features of Android, Software requirements for develop Android application, Android architecture, Components of Android Applications, Steps to Install and configure Android studio and SDK, Android Development Tools(ADT), Android Virtual Device(AVD), Emulator, Dalvik Virtual Machines.	05%
2	**Design GUI in Android** Basics of Views and ViewGroups, Layouts – ConstraintLayout, LinearLayout, RelativeLayout, FrameLayout, Views – TextView, EditText, Button, ImageButton, CheckBox, RadioButton, RadioGroup, ToggleButton, Spinner, ListView, TimePicker, DatePicker, Slider.	25%
3	**Activity, Fragment, Intent and Event Handling** Introduction to Android Activity, Activity Life Cycle, Adding Fragments, Fragment Life Cycle, Navigation between Fragments, intent in Android, Navigate Activity using Intent, passing data between Activities, Event Handling.	30%
4	**Menu, Dialog and Database** Introduction to Menu, Types of Menu in Android, implementation of menu in Android application, Basics of Dialog, types of Dialog in Android, implementation of Dialog in Android application, Introduction to SQLite Database, CRUD operation in Android application,	25%
5	**Services, Notification and Publishing Application** Introduction to service in Android, create and implementation of service in application, Notification in Android, How create and use Notification in Android application, Publishing application.	15%

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	**Exploring Android Development Environment:** Student will select a unique application and draw each require activity with view in separate page. Students have to also describe use of the taken view in the activity in form of table. Then prepare a single pdf or report of that pages and upload it on GMIU web portal.	10

2	**Makes an attractive Interface:** Students will design and implement various layouts and essential UI components for a selected Android application. They must reflect on the design process by answering the following questions: Which design principles were followed? What challenges were encountered during the design, and how were they addressed? As part of the submission, students are required to upload a screenshot of the user interface as an image file, submit the XML layout code as a pdf file and provide a written explanation of the design principles and challenges in a PDF or Word document. All files must be uploaded to the GMIU web portal.	10
3	**Developing an Interactive Multi-Screen Application:** Student have to develop code for selected application in ALA-1 and then upload screen shot and code in pdf on GMIU web portal.	10
4	**Implementing Menu, Dialogs, and Database Operations** Student have to make a menu and use necessary dialog for application, selected in ALA-1, which include appropriate options and perform operation on a database, Upload the XML and java code in pdf on GMIU portal.	10
5	**Building an Application with Services and Notifications** Students will create an Android application utilizing background services and implementing different types of notifications, Upload the XML and java code in pdf on GMIU portal.	10
	Total	50

Suggested Specification table with Marks (Theory):NA

Distribution of Theory Marks **(Revised Bloom's Taxonomy)**						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage %	NA	NA	NA	NA	NA	NA

Course Outcome:

After learning the course the students should be able to:	
CO1	Understand fundamentals of Android.
CO2	Develop capabilities to make different types of application interface using layouts and views.
CO3	Make interactive application using Activity, Fragments and Intent.

CO4	Gain the capability to utilize Menu, Dialog, and Databases in application.
CO5	Implement service and notification to become capable and to publish application in any Android play store.

List of Practical:

Sr. No	Description	Unit No	Hrs.
1	Install and configure Android Studio and SDK on your system.	1	2
2	Create and run a simple "Hello World" application using an Emulator (AVD).	1	2
3	Explore the Android Project Structure and understand key files like AndroidManifest.xml, build.gradle, etc.	1	2
4	Demonstrate the use of Android Virtual Device (AVD) and test an application on an emulator.	1	2
5	Create a Login Form using EditText, Button, and Toast message.	2	2
6	Design a Registration Form using EditText, CheckBox, RadioGroup, and Button.	2	2
7	Implement a ListView to display a list of items dynamically.	2	2
8	Design a DatePicker and TimePicker application to select date and time.	2	2
9	Create an application using ConstraintLayout, LinearLayout, and RelativeLayout to design a responsive UI.	2	2
10	Implement an application demonstrating Activity Lifecycle with Log messages.	3	2
11	Develop an application using Fragments and navigate between them.	3	2
12	Create an application using Explicit Intent to navigate between two activities.	3	4
13	Implement an application using Implicit Intent (e.g., opening a web page, making a call, sending an email).	3	2
14	Develop an application that demonstrates Event Handling (Button Click, Long Press, Gesture).	3	2
15	Create an application implementing an Options Menu, Context Menu and Popup Menu.	4	4
16	Implement an application with Alert Dialog, Progress Dialog, and Custom Dialog.	4	2
17	Create an animation using Tween Animation (Rotate, Scale, Translate, Alpha).	4	2
18	Develop an application using Property Animation (ObjectAnimator, ValueAnimator).	4	4
19	Develop an application to perform CRUD (Create, Read, Update, Delete) operations using SQLite database.	4	4

20	Create a Student Registration Application with SQLite for storing and retrieving student data.	4	4
21	Implement an application using SharedPreferences for storing user preferences.	4	2
22	Develop an application using Foreground Service to play background music.	5	2
23	Implement an application to display Notifications (Basic, Expandable, Actionable Notifications).	5	2
24	Develop an application using Broadcast Receiver for detecting network connectivity changes.	5	2
25	Prepare an APK file and demonstrate the publishing process of an Android application.	5	2
Total			60

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory.

The internal evaluation will be done on the basis of Active Learning Assignment.

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

[1] Android Application Development Black Book by Pradeep Kothari, DreamTech

[2] Beginning Android 4 Application Development by Wei Meng Lee, Wrox

[3] Android Wireless Application Development by Lauren Darcey, Shane Conder, Pearson U

[4] Professional Android 4 Application Development by Meier Reto.

[5] Android Studio Essential by Smith Nell.

[6] Professional Android 2 by Meier Reto.