Birla Institute of Technology & Science, Pilani
Hyderabad Campus

FIRST SEMESTER 2022-2023

Course Handout Part II

Date: 29th August 2022

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No.	: *CS F314*
Course Title	: *Software development for portable devices*
Instructor-in-Charge	: Dr. Manik Gupta (manik@hyderabad.bits-pilani.ac.in)

Scope and Objectives of the Course:

The main objective of the course is to introduce concepts of mobile computing while acquiring skills for creating and deploying mobile applications using existing development platforms and tools. The main focus of the course will be on Android mobile application development platform with emphasis on underlying concepts as well as hands on experience in developing mobile apps. Essential Android programming concepts will be covered and exposure to build a variety of apps using Java will be provided. Advanced features like user experience, localization, working with device sensors will also be covered.

At the end of the course, the student will be able to:
CO1 Understand mobile computing technology and challenges in developing for a ubiquitous environment.
CO2 Understand mobile application software architecture and design components
CO3 Learn an application development platform for portable devices and gain practical hands on experience

Please note that this is an ***advanced undergraduate*** course and requires a ***good working knowledge of Object oriented programming/Java***. It is strongly advised students who have already undertaken courses on Object oriented programming and software engineering should take this course.

Reference Books:

- R1**.** Mobile Computing 3rd Edition by Raj Kamal, Oxford University Press (2018)
- R2. Android Application Development 2nd Edition by Barry Burd, Wiley Publications (2015)
- R3. Android Programming The big nerd ranch guide 4th Edition by Kristin Marsicano, Brian Gardner, Bill Phillips and Chris Stewart, Big Nerd Ranch Publications (2019)
- R4. Head first Android Programming 2nd Edition by Dawn Griffiths and David Griffiths, Oreilly Publications (2017)

- R5. Mobile Design and Development: Practical Concepts and Techniques for Creating Mobile Sites and Web Apps by Brian Fling, Oreilly Publications (2009)

Note: Official Android documentation and online resources will be used as study materials during the course.

Course Plan:

Lecture No.	Learning objectives	Topics to be covered	Chapters in Reference Text Books
L1-2	• To learn about mobile computing along with novel applications and various design considerations for mobile computing • To get an insight into features, limitations and design constraints of mobile devices	• Brief introduction to mobile computing • Mobile client devices and pervasive computing - Classification and characterization of mobile devices, Device design constraints	R1- Chapter 2,3
L3-4	• To understand about different computing environments for smartphones – platforms, application frameworks • To understand basic Android application and its various features	• Mobile Platforms, Operating Systems, Development Environments • Introduction to Android Application Development Platform	R1- Chapter 16 R5 – Chapter 1,2,3,6
L5-7	• To learn about android activities and how to use them in app development • To get an understanding of the complete activity lifecycle • To learn about explicit and implicit intents	• Android Activities • Activity lifecycle • Intents and Intent Filters • Persistent Data	R2- Book 3, Chapter 1 R2- Book 3, Chapter 2
L8-9	• To understand different layout concepts and widget organization • To learn to create various user interaction elements, add themes and styles to create delightful user experience	• Creating User interfaces with Layouts and Widgets • Styles and Themes • User Experience	R2- Book 4, Chapter 1 R3 – Chapter 21
L10-11	• To understand how database processing works in Android	• Working with Databases • Cursors and Cursor adaptors • Room Library	R2- Book 3, Chapter 5 R3 – Chapter 11
L12-13	• To learn how to program using fragments and manage multi panel	• Fragments • Building Apps for Tablets	R2- Book 5, Chapter 1

	activities • To learn how to develop apps that work on both phone and tablets		
L14-15	• To gain an understanding of various Android Architectural Patterns	• MVC, MVP, MVVM	R3 – Chapter 2, 19
	Project Mid Sem Demo and Mid Sem Exam		
L16	• To learn to connect to device hardware sensors and use them in app development • To learn how to create a basic wearable app • To learn to run an Android app on wearable	• Working with Device Sensors • Developing for Android Wear	R2- Book 4, Chapter 3 R2- Book 5, Chapter 2
L17-18	• To learn how to run services • To learn how to create and use a broadcast receiver	• Services • Broadcast Receivers	R2- Book 3, Chapter 3,4
L19-20	• To learn how Background processing works in Android	• Background Threads • Asynctasks	R3 – Chapter 11
L21-22	• To learn to adapt the app based on user specific language settings and vision/hearing/mobility impairments	• Localization • Accessibility	R3 – Chapter 17, 18
L23-24	• To learn how to publish and launch apps	• Preparing and publishing your own apps	R2 – Book 6 Chapter 1, 2
L25-27	• Buffer lectures for invited guest lectures and revision	• Industry Guest Lectures • Course Revision	-
Project Final Demo and Comprehensive Exam			

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Mid Term Exam	1.5 hours	20	04/11 3.30 - 5.00PM	Closed Book
Lab Project (Mid and End semester demos)	--	30	TBA	Open Book
Lab (Quizzes/ Submissions)	--	20	TBA	Open Book
Comprehensive Exam	3 Hours	30	28/12 AN	Closed Book

Note: minimum 40% of the evaluation to be completed by midsem grading.

Chamber Consultation Hour:
H-126, Tuesday 12pm-1pm

Notices:
All notices and announcements pertaining to this course will be displayed on the CMS/Google Classroom.

Make-up Policy:

1. No make-up requests for lab quizzes/submissions will be catered to.
2. Prior permission of the Instructor-in-Charge is required to get make-up for the mid-semester and comprehensive exams. Only on producing documentary proof of absence (before the examination), proving that student would be unable to appear for the exam the decision of granting the make-up will be taken.

Academic Honesty and Integrity Policy:
Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

INSTRUCTOR-IN-CHARGE
CS F314

Proposed Lab Schedule

Lab 1	Android Studio and Hello World
Lab 2	Building an Interactive Application
Lab 3	Multiple Activities and Intents
Lab 4	List Views and Array Adapters
Lab 5	Styles, Themes, and Action bars
Lab 6	Databases
Lab 7	Fragments
Lab 8	Fragments for Larger Interfaces
Lab 9	Android Architecture Patterns
Lab 10	Android Wear Development and Working with Device Sensors