UKA TARSADIA UNIVERSITY

B.C.A. (5thSemester) Syllabus, 2020-2021

Course Code: CS5002 Course Title: Fundamentals of Mobile Application Development

Course Credits: 04 [Lectures: 04, Tutorial: 00, Practical: 04]

Prerequisites: Fundamentals of Object-Oriented Programming, Web design, and Relation DBMS

Prerequisites By Topics: Inheritance, Interface, and Package

Objectives: To build knowledge of mobile technologies and its environment to design, develop and deploy applications for mobile devices using design elements, data management, system services, and media APIs.

Course Outcomes: Upon completion of the course, students shall be able to

CO1:	Describe mobile technologies, its versions, mobile application development architecture and environment.	Understanding
CO2:	Describe the mobile application development life cycle and way of communication between application components.	Understanding , Analysis
CO3:	Design and develop mobile applications user interface using designing elements.	Understanding , Apply
CO4:	Analyze and use appropriate data storage options such as Shared Preferences, Internal, External and Database to manage data into mobile applications.	Apply, Analysis
CO5:	Creating and implement the background services and user alerts for improving the performance of the mobile application.	Analysis
CO6:	Integrate multimedia into mobile applications using media API.	Apply, Analysis

Course Objective and Outcome Mapping:

To build knowledge of mobile technologies and its environment : CO1

To design, develop and deploy applications for mobile devices using design elements, data management, system services: CO2, CO3, CO4, CO5

Utilize media APIs: CO6

Programme Outcomes:

PO1: Ability to understand the concepts of key areas in computer science.

PO2: Ability to design and develop system, component or process as well as test and maintain it so as to provide promising solutions to industry and society.

PO3: Effective communication and presentation skill.

PO4: Ability to understand professional and ethical responsibility.

PO5: Recognition of the need for life-long learning.

Programme Outcomes and Course Outcomes mapping:

Course Outcomes	Programme Outcomes				
	PO1	PO2	PO3	PO4	PO5
CO1	√	√			√
CO2	√	√			√
CO3	√	√	√		
CO4	√	√		√	
CO5	√	√			√
CO6	√	√			√

1 Introduction to Mobile Application Development [15 %]

1.1. Overview of Mobile Technologies: Android, iOS and Windows

1.2. Features and Architecture

1.3. History of Operating System and Development Tools

1.4. Types of Mobile Application: Native, Hybrid and Web

1.5. Deployment Process

2 Core Components [15 %]
- 2.1. Screen: Introduction and life cycle
- 2.2. Linkage between Screen and In-Built application
- 2.3. Fragment: Introduction, Need, Lifecycle, Creation and Communication between fragment
- 2.4. Application Resource: Store and Access

3 Design Elements [20 %]
- 3.1. Overview of UI for Web and Mobile
- 3.2. Designing UI with Layouts: Need and Types: Linear, Relative, Constraint, List, Frame and Grid-based
- 3.3. GUI Elements: Input Elements, Navigational Elements and Informational Elements
- 3.4. Dialog Box in Application: Need, Types: Decision Making and Informative
- 3.5. Exploring Menu: Need, Types: Option Menu and Context Menu

4 Working with Data Storage Mechanism [20 %]
- 4.1. User Preferences: Saving and Loading
- 4.2. Persisting Data to Files: Internal Storage and External Storage
- 4.3. CRUD operations
- 4.4. Shared data reading and updation: Call Log, Contact

5 Service and User Alerts [15 %]
- 5.1. Service: Introduction, Need, Life Cycle
- 5.2. Service Task Management: Long, Repeated
- 5.3. Management of SMS and Notification Services
- 5.4. User Alerts: Need, Alarm Services
- 5.5. Integration of Web Services: Retrieval and Parsing

6 Working with Multimedia [15 %]
- 6.1. Media APIs: Introduction, Need, Usage
- 6.2. Working with Screen Pixels: Camera
- 6.3. Animation: Need, Types: Frame by Frame and Tweened Animation
- 6.4. Multimedia Audio, Video and Audio Recorder Content: Creating, Playing, Killing and Releasing Memory

Course Units and Course Outcomes Mapping:

Unit No.	Unit	Course Outcomes					
		CO1	CO2	CO3	CO4	CO5	CO6
1	Introduction to Mobile Application Development	✓					
2	Core Components	✓	✓				
3	Design Elements	✓		✓			
4	Working with Data Storage Mechanism	✓			✓		
5	Service and User Alerts	✓				✓	
6	Working with Multimedia	✓					✓

Computing Environment:

CE#1:A student must have the following computing environment in the laboratory and/or on his/her laptop.
Android Studio 3.0 or above

Text Books/Material References :

1. Dave MacLean, Pro Android 5, Apress.[DM]

Reference :

1. Wei-Meng Lee, Beginning Android 4 Application Development, Wiley India Pvt Ltd.
2. Reto Meier, Professional Android 2 Application Development, Wiley India Pvt Ltd.
3. Android Programming for Beginners, John Horton
4. J. F. DiMarzio, Beginning Android Programming with Android Studio, Wrox A Wiley Brand
5. Mark L Murphy, Beginning Android, Wiley India Pvt. Ltd.

Course Curriculum Execution Guidelines

Semester Objectives:

SO1: Enhance technical writing skill
SO2: Improve presentation skill
SO3: Promote contribution of students to share course related information
SO4: Develop system based problem solving skill

Content Delivery: *The course content shall be delivered by following pattern, wherein teacher must give approximately 75% hours exclusively for imparting conceptual knowledge. Rest 25% hours for demonstration/hands-on regarding supported tool and technology.*

Curriculum Enrichment Activity: Pre-requisites and Extension Topics to be covered on working Saturdays. Pre-requisites must be covered through conceptual discussion along with demonstration using tool, hands-on exercise and practice examples based on the nature of the topic.

Activity Type	Topics	Activity	Objective	During
Bridge	A Session on Java Programming Concepts	Crash course of 6 hours	*To polish up their Java programming fundamentals as pre-requisites required before the beginning of Unit 2, 3 and 4 of the course.*	3rd Week of Semester
Extension	A Session on Material Design in Mobile Application Development	Expert Talk	*To motivate students learning for the field of Mobile Application Development*	10th Week of Semester

Laboratory Guidelines

- A course teacher shall prepare a fresh practical list for each academic year with no repeated problems from previous two consecutive years.
- The practical problem list shall consist of "Required number of problems" for journal certification as well as "Practice problems" of varying nature from each unit as per its weightage and criticality.
- Laboratory supervisor or course teacher shall sign in the journal only if he/ she is satisfied by the work of student.
- Journal shall be verified by the laboratory teacher as well as by the course teacher at-least thrice in a semester at an interval of 10 laboratory sessions or an appropriate interval upon the discretion of the course teacher.
- Journal must not be certified if required number of problems are not included and not written clearly or copied.
- After approved by Course Co-ordinator, the List of problem definition shall be kept by concern teacher on web site before the commencement of the semester.
- Problem list shall contain practical problems from each of the units are as follow:

Unit No.	Required no. of problems to get the journal certified	Covering Unit / Sub-Unit
2	2	2.2 to 2.4
3	2	3.2 to 3.5
4	3	All subunits
5	3	All subunits
6	2	All subunits
Total	**14**	

Assessment Parameters to evaluate Course Outcome and Semester Skills other than disseminated by Evaluation and Assessment Cell

1. *AP1: Technical Report Preparation*
2. *AP2: Case Study and Analysis*
3. *AP3: MOOC Enrolment, Presentation and Assignment Submissions*
4. *AP4: Application Development and Demonstration*

Semester Skill	Assessment Parameter			
	AP1	AP2	AP3	AP4
SO1	✓			
SO2		✓		
SO3			✓	
SO4				✓