



बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsa Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

School of Computer Science

P.G.D.C.A. (Post Graduate Diploma in Computer Applications) Programme

Subject Code & Name: PGDCA205-2 - Mobile Application Development using Flutter

Teaching And Evaluation Scheme:-

Teaching Scheme				Examination Scheme			
Credits				Component Weightage			
				CCE		SEE	
L	T	P	Total	TH	PWE	TH	PWE
4	-	-	4	50%	-	50%	-

Programme Name	P.G.D.C.A.
Semester	2
Course Code	PGDCA205-2
Course Title	Mobile Application Development using Flutter
Course Content Type (Th. / Pr.)	Th.
Course Credit	4
Sessions + Lab Per Week	4
Total Teaching/ Lab Hours	60
* 2 Lab = 1 session	

Learning Objectives

Upon successful completion of this course, students will be able to:

- Understand the concepts of mobile applications, Android architecture, development tools, and Flutter development environment setup
- Apply Dart programming constructs, object-oriented programming principles, collections, exception handling, and asynchronous programming techniques to solve computational problems



- Develop mobile user interfaces and application functionality using Flutter widgets, layouts, forms, navigation, state management, and API integration.
- Design and implement interactive mobile applications using Flutter animations, Firebase services, authentication, cloud database operations, and deployment techniques.

Learning Outcomes

After successful completion of the course, students will be able to:

- Explain different types of mobile applications, Android architecture, Android software stack, and Flutter development tools
- Develop Dart programs using variables, control statements, functions, collections, OOP concepts, exception handling, and asynchronous programming constructs.
- Create responsive Flutter applications incorporating widgets, user interactions, routing, state management, assets, and RESTful API data consumption.
- Build Flutter applications with animations, Firebase authentication, CRUD operations, and APK generation for real-world mobile platforms.

CLO-PLO Mapping Matrix:

CLOs/PLOs	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
CLO1	3	1	2	3	2	2
CLO2	3	3	3	2	2	2
CLO3	3	3	3	3	2	2
CLO4	3	3	3	3	3	3

Detailed Contents

Unit	Topic/Sub Topic	Teaching Hours
I Introduction to Android Mobile Applications	• Introduction to Mobile Application • Types of Mobile Applications ◦ Native Applications ◦ Hybrid Applications ◦ Web Applications • Features and challenges of Mobile Applications • Introduction and History of Android • Android Versions and Features • Advantages and Limitations of Android • Architecture of android • Android Software Stack • Introduction to Android Studio • Introduction to Flutter SDK • Setting up Development Environment • Emulator and Physical Device Configuration	15

II Dart Programming	• Introduction to Dart • Features of Dart • Variables and Data Types • Operators and Expressions • Input and Output operations • Decision Control Statements • Looping statement • Functions and Parameters • Anonymous functions • List, Set, Map Collection • Object-Oriented Programming Concepts ◦ Classes and Objects ◦ Constructors ◦ Inheritance ◦ Polymorphism ◦ Abstraction and Encapsulation • Exception Handling • Asynchronous Programming ◦ Future ◦ async and await	15
III Flutter Mobile Application Development	• Introduction to Flutter • Advantages of Flutter • Flutter Architecture • Flutter Widgets ◦ Stateless Widget ◦ Stateful Widget • Basic Widgets : Text, Button, Image, Icon • Layout Widgets: Row, Column, Container, Stack, ListView, GridView • User Input Widgets • Forms and Validation • Navigation and Routing • State Management Basics • Handling Assets and Images • Working with Packages • HTTP and REST API Integration • Fetching and Displaying API data in Listview	15
IV Flutter Animations and Firebase	Flutter Animations • Introduction to Animations • Implicit and Explicit Animations Firestore with Flutter • Introduction to Firestore • Firestore Project Setup • Connecting Flutter with Firestore • Firestore Authentication ◦ Email and Password Login • CRUD Operations using Firestore	15

	App Deployment • APK Generation • Introduction to Google Play Store Deployment	
Reference Books		
1. Mastering Flutter (2025), Kevin Moore, BPB Publication 2. Mobile App Development using flutter and Dart (2024), Aritra Brahma, Himadri Nath Saha, Techno World		
Web Resources		
1. https://dart.dev/docs 2. https://www.geeksforgeeks.org/dart/dart-tutorial/ 3. https://www.tutorialspoint.com/flutter/index.htm 4. https://docs.flutter.dev/ui		
Required Software(s) (if Any)		
Android Studio, flutter SDK, Dart SDK, firebase		

L:: Lecture, **T::** Tutorial, **P::** Practical

CCE:: Continuous & Comprehensive Evaluation

(CCE theory includes Mid Semester Examination, Assignment, MCQ Quizzes, Seminar, Reflective Notes, Class Participation, Case Analysis and Presentation, Slip Tests (Announced/ Surprised), Attendance etc. or any combination of these)

PWE: Practical Work Examination

(PWE includes Laboratory Practical Work, Project Work, Viva simulation exercise work etc.)

SEE:: Semester End Evaluation