

 Darshan UNIVERSITY <small>योग: कर्मसु कोशलम्</small>	Graduation Level:	
	Course:	Diploma
	Subject Name:	Mobile Programming using Flutter
	Subject Code:	2302CS501
	Semester:	5 th

Type of Course: Professional Core

Prerequisites: Object Oriented Programming

Course Objective / Rationale: This Course will enable students to create mobile applications across the mobile operating systems - Android and iOS. Students understand how to implement OOPS concept to create efficient and Implementable applications.

Teaching & Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	4	5	70	30	25	25	150

Contents:

Unit No.	Topic	Total Hours	Weightage %
1	Introduction to Dart Programming Language: Nullable – Nonnullable Variables, Access Modifier, Decision Making(?), Loops (for..in, for..each), Functions(Named optional parameters, Optional positional parameters, Optional parameter with default values, Anonymous functions, Arrow function), Collection Classes (List<E>, Map<K, V>, HashMap<K, V>, List<Model Class>)	8	20
2	Flutter Architecture & UI Design: Flutter Architecture, Project Structure (Pubspec File, Assets, Lib, Android, iOS), Stateless Widget, Stateful Widget, Scaffold, SafeArea, AppBar, Text, TextField, TextFormField, Button, SnackBar, Row, Column, SizedBox, Padding, Stack, Container, CardView, AppBar, Image, Icon, CheckBox, Radio	8	20
3	Scrollable Widgets & Navigation: Return Data To Previous Page using pop()& push().then(), ListView, ListView.builder, ListTile, Difference between ListView & ListView.builder, GridView, GridView.builder, Difference between GridView & GridView.builder, PageView & PageView.builder, Single Child Scroll View, Bottom Navigationbar, MaterialPageRoute, Navigator.push(), Navigator.pop(),	10	20
4	Introduction to Database & Dialog Control: Async Await, Future, Future Builder, Sqllite Studio, Create tables, Sqflite plugin, Copy Database from asset to root, Perform CRUD Operation, Refresh Current and Previous Screen, Progress Dialog, Alert Dialog	10	20
5	Accessing Rest API & Dialog: Introduction to API, Restfull API & Restless API, API URL & Endpoints, JSON data Format, JSON Parsing, Networking with Rest API using http package, Store local data using shared preferences	9	20
		45	100

Suggested Specification Table with %Marks (Theory)

Distribution of Theory Marks %					
R Level	U Level	A Level	N Level	E Level	C Level
10	60	30			

R: Remembrance; U: Understanding; A: Application, N: Analyse; E: Evaluate and C: Create and above Levels
(Revised Bloom's Taxonomy)

Course Outcome: After completing the course student will be able to

CO – 1	practice different datatypes and programming in dart language
CO – 2	design screens using different stateless and statefull widgets
CO – 3	use navigation between different pages and refresh screens
CO – 4	perform CRUD operations with database
CO – 5	use APIs to transfer data between application and server

Suggested List of Experiments / Exercises:

Ex. No.	Unit No.	Practical / Exercise	No. of Hrs.
1	1	Practice Dart Program <ol style="list-style-type: none"> W.A.P. to print your name in console. (A) W.A.P. to find percentage of 5 subject. (A) Body Mass Index (BMI) is measure of health on weight. It can be calculated by taking your weight in kilograms and dividing by square of your height in meters. Write a program that prompts the user to enter weight in pounds and height in inches and display the BMI. Note: 1 pound=.45359237 Kg and 1 inch=0.254 meters. (A) W.A.P. to check whether the given number is positive or negative. (A) W.A.P. to perform Addition, Subtraction, Multiplication, Division based on user choice using if, if..else..if, & switch. (B) 	2
2	1	Practice Program using Array and List <ol style="list-style-type: none"> W.A.P. to count number of even or odd number from an array of n numbers. (A) W.A.P. to insert int numbers into List and display in terminal. (A) W.A.P. to insert Strings into List and display in terminal. (A) W.A.P. to insert double into List and display in terminal and do sum of all numbers and print it with 2 decimal only. Ex: Total = 22.39998 => 22.40 (A) W.A.P. to sort values in List. Ex. Input : [13, 2, -11, 142, -389, 0] Result: [-389, -11, 0, 2, 13, 142] (B) 	2
3	1	Practice Program using Class and Object <ol style="list-style-type: none"> Create a class named Candidate with Candidate_ID, Candidate_Name, Candidate_Age, Candidate_Weight and Candidate_Height data members. Also create a method GetCandidateDetails() and DisplayCandidateDetails(). Create main method to demonstrate the Candidate class. (A) W.A.P. to create class Animal that has a method called animalSound() Subclass of Animals is cat it has its own implementation of an animal sound. (B) W.A.P. to find friends detail by their name using dictionary. (Create local dictionary and search from it using Map & Model Class) (C) 	2
4	2	Write a Flutter Code using Container Widget and Expanded Widget <ol style="list-style-type: none"> Create a flutter project with proper name in Android Studio and observe different files for programming. (A) 	2

		<ol style="list-style-type: none"> W.A.P. to divide horizontal space of the screen into 3 different equal parts with different colors. (A) W.A.P. to divide the vertical space of the screen into 3 different equal parts with different colors. (A) W.A.P. to divide the whole screen into 9 (equal size and different size) with different colors. (B) 	
5	2	Write a Flutter Code using Text Widget and TextField Widget using Validation <ol style="list-style-type: none"> W.A.P. to display "hello world" using Text widget. Change color & size of text using different properties. (A) W.A.P. to use TextField and print the input value into the terminal using the controller. (A) W.A.P. to do validation in the login screen. (Email Validation & Password Validation) on Button click. (B) 	2
6	2	Write a Flutter Code for Use Different Widgets <ol style="list-style-type: none"> W.A.P. to Add password visibility icon in the Text field. (A) W.A.P. to create a registration screen using different widgets (Text, TextFormField, SizedBox, Radio, CheckBox, List, Button etc...)(B) 	2
7	2	Write a Flutter Code using Stack Widget, Image Widget <ol style="list-style-type: none"> W.A.P. to display an Image into the Image asset widget from the asset folder. (A) W.A.P. to use Stack widget and show text upon an Image. (A) W.A.P. to create a birthday card using different widgets.(A) W.A.P. to display an Image from a WEB URL using a cached network Image. (B) 	2
8	2	Design a Flutter UI using Different Widgets <ol style="list-style-type: none"> W.A.P. to Design simple calculator UI using Column, TextField, ElevatedButton, and Row. (A) W.A.P to Design Shopping Item Card using Card, Column, Image, Text, and ElevatedButton. (A) W.A.P. to Design Simple Survey Form using Column, TextField, RadioListTile, CheckBox, and ElevatedButton.(B) 	2
9	2	Design a Flutter UI using Different Widgets <ol style="list-style-type: none"> W.A.P. to Design Feedback Form UI using Column, TextFormField, ElevatedButton, and SnackBar. (A) W.A.P. to Build a Quote Generator App using Column, Text, ElevatedButton, and SnackBar (B) 	2
10	2	Design a Flutter UI using Different Widgets <ol style="list-style-type: none"> W.A.P. to Design To-Do List UI using Column, Text, Checkbox, ElevatedButton, and Padding. (A) W.A.P. to Design Music Player UI using Card, Text and Buttons. (B) 	2
11	3	Write a Flutter Code using ListView and GridView <ol style="list-style-type: none"> W.A.P. to create list of numbers and display using ListView. (A) W.A.P. to create list of numbers and display using ListView.builder. (A) W.A.P. to create list of images path in List and display it using Gridview and then Gridview.builder. (B) 	2
12	3	Write a Flutter Code using ListView and ListView.builder <ol style="list-style-type: none"> W.A.P. Design Contact List UI use ListView to display a list of contact with CircleAvatar, Text, and Trailing Icon. (A) W.A.P. Design E-commerce UI use ListView.builder to display a list of items with CircleAvatar, Text, and ElevatedButton. (B) 	2
13	3	Write a Flutter Code using GridView and GridView.builder <ol style="list-style-type: none"> W.A.P. Design Movie Poster UI using GridView, Card, Image. (A) 	2

		2. W.A.P. Design Photo Gallery UI using GridView.builder, Card, Image and InkWell. (B)	
14	3	Write a Flutter Code using PageView and PageView.builder 1. W.A.P. Design PageView with 3D Page Transition Effect. (A) 2. W.A.P. Design Quotes Swiper UI using PageView, Card, Text and IconButton. (B)	2
15	3	Write a Flutter Code using TabBar and Navigation Drawer 1. W.A.P. to use TabView and display different pages on different tab clicks. (A) 2. W.A.P. to use the NavigationDrawer & display different pages on different menu clicks. (B)	2
16	3	Write a Flutter Code for Navigation Between Pages 1. W.A.P. to navigate from one page to another page using material page route. (A) 2. W.A.P. to navigate from one page to another page and pass data to another page using constructor. (B)	2
17	4	Build Student Management App using SQLite Database 1. Create Database using Helper Class. (A) 2. Create Student Model Class (B)	2
18	4	Build Student Management App using SQLite Database 1. Design Login Screen and Fetch Username and Password from Database. (A) 2. Design Add Student Screen (Name, Enrollment Number, Semester, Branch , Mobile Number) (B)	2
19	4	Build Student Management App using SQLite Database 1. Design Home Screen (List Students) with Edit and Delete Button (A) 2. Design Student Detail Screen when click on Student Name All Details of Particular Student Open in New Screen (B)	2
20	4	Build Student Management App using SQLite Database 1. Create Edit Student Screen (A) 2. Create Delete Student Functionality (B)	2
21	5	Write a Flutter Code for Alert Dialog, Date Picker and JSON File 1. W.A.P. to create Alert Dialog with material & Cupertino theme and display it with 1"Ok" button. (A) 2. W.A.P. to generate model class from json. (A) 3. W.A.P. to fetch json file from asset & parse json data and display data in widget. (A) 4. W.A.P. to show DatePickerDialog on button click and set selected date. (B)	2
22	5	Write a Flutter Code using Rest API 1. W.A.P. to call rest API (using MockAPI) with GET Method with HTTP client library and display data in List widget using future builder. (A) 2. W.A.P. to pass Path Variable and Query Variable as parameters in GET Method and display the single record in the full- screen page. (B)	2
23	5	Write a Flutter Code using Rest API 1. W.A.P. to call rest API and display data in ListView.builder with pagination (Lazy Loading). (A) 2. W.A.P. to Design News app rest API and display news in GridView.builder with pagination (Lazy Loading). (B)	2
24	5	Flutter application using Rest API 1. W.A.P. to design entry screen with Name, DOB, City, Address, etc. validate it & save data to webserver using POST method with form-urlencoded. (A)	2

		2. W.A.P. to design Contact US form with Name, Email, Message validate it & save data to webserver using POST method with form-urlencoded. (B)	
25	5	Flutter application using Rest API <ol style="list-style-type: none"> 1. W.A.P. to display Country List in dropdown on selection of country call state API and fill data in state list after selection state call city API and fill city list in dropdown (A) 2. W.A.P. to display a list of movies in a dropdown. On selecting a movie, fetch its details, and display the cast & reviews dynamically using TMDb API. (B) 	2
26	5	Flutter application using Rest API <ol style="list-style-type: none"> 1. W.A.P. to Design Product Listing UI Fetch Product Data from API. (A) 2. W.A.P. Design and create your own fake API for food and fetch the data into the Flutter UI. (B) 	2

Learning Recourses:

A. Text & Reference Books:

1. Beginning App Development with Flutter By Rap Payne | Apress | 1st
2. Pragmatic Flutter By Priyanka Tyagi | CRC Press | 1st
3. Beginning Flutter: A Hands On Guide to App Development By Marco L. Napoli | Wrox | 1st
4. Flutter Apprentice By Moore K.

B. Major Equipment:

C. Software: Flutter SDK, Android Studio, VSCode

D. Learning Websites: <https://flutter.dev/>