

<b>COURSE TITLE</b>	<b>CROSS PLATFORM MOBILE APPLICATION DEVELOPMENT</b>
<b>COURSE CODE</b>	<b>01CT1517</b>
<b>COURSE CREDITS</b>	<b>4</b>

**Objective:**

- 1 This course facilitates classroom and laboratory learning, letting students learn dart programming language and develop competence and confidence in cross platform mobile application development using flutter. Students will understand the Flutter app development environment and apply advanced features, so the students can independently create and deploy cross platform mobile application.

**Course Outcomes:** After completion of this course, student will be able to:

- 1 Demonstrate the basic primitives in Flutter and Dart framework (Apply).
- 2 Model native platform code using Flutter and Dart (Apply).
- 3 Examine the use of widgets and user interactions in application development (Analyze).
- 4 Evaluate application development using the concepts of animation and interactive widgets (Analyze).
- 5 Construct flutter and dart applications using customized layouts and service interactions (Create)

**Pre-requisite of course:**Basics of programming language, Concepts of OOP

**Teaching and Examination Scheme**

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	<b>Introduction to flutter</b> Flutter Framework, Working of Flutter and Dart, installation of Flutter SDK, Using Hot Reload and themes, External packages import, project templates, organizing files and folders, Introduction to Dart: Declaring and referencing variables, using operators, flow control statements,, using functions and classes,, implementing asynchronous Programming	8
2	<b>Widget and User Inputs</b> Widget : state full and state less widgets , Using common widgets: Scaffold, AppBar, SafeArea, Container, Text, Buttons, column, row, using images and icons, decorators, form widgets, Various Buttons, User Inputs: Radio,Checkbox, Slider, Textediting Controller, State management: Handling state and Set state, calculator app	10

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
3	<b>App's Navigation</b> Using Navigator, named navigator route, Hero widget, Bottom Navigation Bar Bottom Map Bar, Tab Bar, Tab Bar View, Drawer, Saving data with local persistence: Reading and Writing files, working with key- value pairs,, Supporting multiple locales	10
4	<b>Layout and API</b> Building layouts: Scrolling Lists, Card widget, Using ListView and ListTile, GridView, Stack widget, Customizing CustomScrollView using Slivers, Http API Call: Working with Future object, working with streams, building, widgets based on stream and futures, handling various types of data: JSON, Sending HTTP request, JSON Encode Decode, Firebase : Introduction to Firebase and cloud Firestore.	14
<b>Total Hours</b>		<b>42</b>

#### Suggested List of Experiments:

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
1	<b>Experiment 1</b> To install and configure Flutter Environment.	2
2	<b>Experiment 2</b> To Study basics of Dart language and design basic Flutter App.	2
3	<b>Experiment 3</b> To design Flutter UI by including common widgets.	2
4	<b>Experiment 4</b> To create an interactive Form using form widget.	2
5	<b>Experiment 5</b> To design a layout of Flutter App using layout widgets.	2
6	<b>Experiment 6</b> To include icons, images, charts in Flutter app.	2
7	<b>Experiment 7</b> To apply navigation, routing and gestures in Flutter App.	2
8	<b>Experiment 8</b> To analyze sensor data in Flutter App.	2
9	<b>Experiment 9</b> To Connect Flutter UI with fireBase database.	2
10	<b>Experiment 10</b> To test and deploy production ready Flutter App on Android platform.	2
11	<b>Experiment 11</b> Open Ended Practical [ Task based Mini Project-1]	2
12	<b>Experiment 12</b> Open Ended Practical [ Task based Mini Project-2]	2

### Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
13	<b>Experiment 13</b> Open Ended Practical [ Task based Mini Project-3]	2
14	<b>Experiment 14</b> Open Ended Practical [ Task based Mini Project-4]	2
<b>Total Hours</b>		<b>28</b>

### Textbook :

- 1 Beginning Flutter: A Hands-on Guide to App Development, Marco L. Napoli, John Wiley Sons, 2020

### References:

- 1 Dart for Absolute Beginners, Dart for Absolute Beginners, D. Kopec, Apress , 2014
- 2 Flutter Recipes, Flutter Recipes, Fu Cheng, Apress, 2019

### Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
10.00	20.00	25.00	20.00	10.00	15.00

### Instructional Method:

- 1 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- 2 Practical examination will be conducted at the end of the semester for evaluation of performance of students in laboratory
- 3 Students may use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory, etc.
- 4 The course delivery method will depend upon the requirement of content and need of the students. The teacher in addition to conventional teaching method (Chalk and Talk) may use any of the tools such as demonstration, role play, Quiz, brainstorming, Flipped class, Project based learning, Collaborative learning, MOOCs etc. for effective teaching.

### Supplementary Resources:

- 1 <https://flutter.dev/>
- 2 <https://developers.google.com/learn/topics/flutter>