Daffodil International University

Department of Computer Science and Engineering

Lab Manual

Version: 2022.01

Course Code: CSE 335
Course Title: Pervasive Computing and Mobile Application Development

Table of Contents

Session 1: Introduction to Mobile Application Development (Week-1)

Intended Learning Outcome:

By end the end of this session, students are expected to gain a brief knowledge on mobile application development.

Session Topics:

- Introduction to Mobile Application development
- Importance of Application Development
- Types of Mobile Application Development

Expected Learning Outcome:

- Understand about the mobile application development
- Able to know its importance on business, user, and developer perspective
- Understand the different types of application development

Session 2: Introduction to Dart (Week-2)
Intended Learning Outcome:
By end the end of this session, students are expected to gain working knowledge on Dart programming language.

Session Topics:
- Input / Output
- Datatype
- Variable
- If-else
- Loop
- List & Map

Expected Learning Outcome:
- Write basic program using Dart
- Able to solve problems using Dart

Lab Exercise:
- Solving 4/5 basic problems in dart language.

Tools:
- Android Studio
- Visual Studio Code
- Emulator
- Browser

Department of Computer Science and Engineering
CSE335: Pervasive Computing and Mobile Application Development
Credits: 02   **Lab Manual v.1.0**

Session 3: Object Oriented Programming with Dart (Week-3)
Intended Learning Outcome:
By end the end of this session, students are expected to gain working knowledge on Object Oriented Programming with Dart programming language.
Session Topics:
- Importance of OOP
- Class
- Object
- Encapsulation
- Constructor
- Inheritance
- Polymorphism

Expected Learning Outcome:
- Will be able to solve OOP related problems with dart.

Lab Exercise:
- Solving 2/3 basic OOP problems in dart language.

Tools:
- Android Studio
- Visual Studio Code
- Emulator
- Browser

Session 4: Introduction to Flutter (Week-4)
Intended Learning Outcome:
By end the end of this session, students are expected to gain working knowledge on flutter basics.
Session Topics:
- Flutter project creation
- Hot Reload/Restart
- MaterialApp Class
- Scaffold Class
- Color Class
- Text Class
- TextStyle Class

Expected Learning Outcome:
- Will be able to create a flutter project
- Will be able to use the mentioned classes to solve problems

Lab Exercise:
- Create flutter project
- Use the classes to solve 1/2 problem

Tools:
- Android Studio
- Visual Studio Code
- Emulator
- Browser

Session 5: Introduce with basics classes-1 (Week-5)
Intended Learning Outcome:
By end the end of this session, students are expected to gain working knowledge on flutter basic classes.
Session Topics:
- AppBar Class
- Icons Class
- Center Class
- Container Class
- Inkwell Class

Expected Learning Outcome:
- Will be able to use the mentioned classes to solve problems

Lab Exercise:
- Use the classes to solve 1/2 problem

Tools:
- Android Studio
- Visual Studio Code
- Emulator
- Browser

Session 6: Introduce with basics classes-2 (Week-6)
Intended Learning Outcome:
By end the end of this session, students are expected to gain working knowledge on flutter basic classes.
Session Topics:
- Column Class
- Row Class
- Expanded Class
- SizedBox

Expected Learning Outcome:
- Will be able to use the mentioned classes to solve problems

Lab Exercise:
- Use the classes to solve 1/2 problem

Tools:
- Android Studio
- Visual Studio Code
- Emulator
- Browser

Session 7: Develop A Simple Calculator-1 (Week-7)
Intended Learning Outcome:
By end the end of this session, students are expected to gain working knowledge on flutter frontend design.

Session Topics:
- Design the interface of the calculator

Expected Learning Outcome:
- Will be able to know how to design a basic app interface

Lab Exercise:
- Design the interface of the calculator according to student's design sense

Tools:
- Android Studio
- Visual Studio Code
- Emulator
- Browser

Session 8: Develop A Simple Calculator-2 (Week-8)

Intended Learning Outcome:

By end the end of this session, students are expected to gain working knowledge on how to build functionalities based on the design.

Session Topics:

- Build functionality of the calculator

Expected Learning Outcome:

- Will be able to know how to add functionalities in an application

Lab Exercise:

- Build 1/2 functionalities for the calculator

Tools:

- Android Studio
- Visual Studio Code
- Emulator
- Browser

Session 9: Gradient, Drawer, Bottom Navigation (Week-9)
Intended Learning Outcome:
By end the end of this session, students are expected to gain working knowledge on flutter classes specially how to create menu in flutter.
Session Topics:
- Will be able to use the mentioned classes to solve problems

Expected Learning Outcome:
- Will be able to use the mentioned classes to solve problems

Lab Exercise:
- Use the classes to solve 1/2 problem

Tools:
- Android Studio
- Visual Studio Code
- Emulator
- Browser

Session 10: Work with API(Week-10)
Intended Learning Outcome:
By end the end of this session, students are expected to gain working knowledge on API usage in flutter.
Session Topics:
- API Integration in flutter

Expected Learning Outcome:
- Will be able to use API in flutter application

Lab Exercise:
- Use API to solve 1/2 problem

Tools:
- Android Studio
- Visual Studio Code
- Emulator
- Browser

Session 11: Work with Google Sheet (Week-11)
Intended Learning Outcome:
By end the end of this session, students are expected to gain working knowledge on how to use Google Sheet to store data using flutter.

Session Topics:
- Google Sheet CRUD operation in flutter.

Expected Learning Outcome:
- Will be able to use Google sheet as database.

Lab Exercise:
- Use Google Sheet to solve 1/2 problem

Tools:
- Android Studio
- Visual Studio Code
- Emulator
- Browser

Department of Computer Science and Engineering

CSE335: Pervasive Computing and Mobile Application Development

Credits: 02   **Lab Manual v.1.0**

Session 12: Firebase (Week-12 to Week-14)

Intended Learning Outcome:

By end the end of this session, students are expected to gain working knowledge on how to use Firebase to store data using flutter.

Session Topics:

- Introduction to Firebase
- Firebase Authentication
- Firebase Push Notification
- Firebase firestore database
- Firebase real-time database

Expected Learning Outcome:

- Will be able to do Firebase CRUD operation in flutter

Lab Exercise:

- Use Firebase to solve 1/2 problem

Tools:

- Android Studio
- Visual Studio Code
- Emulator
- Browser

Session 13: Project integration and presentation (Week-15 to Week-16)
Intended Learning Outcome:
Since this is the project demonstration session, teams will be able watch each other's work and gain valuable knowledge on mobile application development.

Session Topics:
- Working for the team project and prepare demo
- Working for the team project

Expected Learning Outcome:
- Demonstration of the team project.
- Lab performance appraisal based on Project Work

Tools:
- Android Studio
- Visual Studio Code
- Emulator
- Browser

Textbook(s)
1. Beginning Flutter: A Hands On Guide to App Development by Marco L. Napoli
2. Learn Google Flutter Fast: 65 Example Apps by Mark Clow

References:
1. Official Flutter Documentation: https://docs.flutter.dev/