FLUTTER SYLLABUS.

 Dart and Flutter Development Course Syllabus

Course Duration: 2 Months

Course Structure:

**• Weeks 1-6: Making Basics Strong**

**• Weeks 7-8:Real Market (or world) Project Development**

**• Overview of Dart**

o Introduction to Dart and its Ecosystem

o Setting Up the Dart Development Environment

o Dart Fundamentals (Data Types, Variables, Operators)

**• Control Flow and Functions**

o Conditional Statements (if, else, switch)

o Loops (for, while, do-while)

o Functions and Methods

o Lambda Expressions

**• Object-Oriented Programming in Dart**

o Classes and Objects

o Constructors, Inheritance, and Polymorphism

o Abstract Classes, Interfaces, and Mixins

o Asynchronous Programming (Futures, async, await)

**• Error Handling in Dart**

o Exceptions and Try-Catch Blocks

o Custom Exception Handling

**• Introduction to Flutter Framework**

o Overview of Flutter and Its Architecture

o Understanding Flutter Widgets

o Setting Up the Flutter Development Environment

o Creating Your First Flutter App

**• Stateless and Stateful Widgets**

o Building Simple UIs with Stateless Widgets

o Stateful Widgets for Dynamic UIs

o Widget Lifecycle

**• Flutter Layouts and Styling**

o Understanding Layout Widgets (Row, Column, Stack)

o Container, Padding, and Spacing Widgets

o Customizing Styles (Colors, Fonts, Themes)

o Responsive Design in Flutter

**• Handling User Input**

o TextFields, Buttons, and Forms

o Form Validation

o Managing State (setState, Blocs)

Module 3: Working with Flutter Widgets

**• Building Custom Widgets**

o Composing Custom Widgets

o Creating Reusable Components

**• Navigation and Routing**

o Navigating between Screens

o Passing Data between Screens

o Named Routes and Navigation Stack

**• Animations in Flutter**

o Basic Animations (Tween, AnimationController)

o Hero Animations and Page Transitions

o Advanced Animations (Custom Animations)

**• Handling Gestures**

o Gesture Detection (Tap, Swipe, Drag)

o Using GestureDetector for Interactive UIs

Module 4: Networking and Backend Integration

**• HTTP Requests and REST API Integration**

o Fetching Data from APIs using http package

o Parsing JSON Data

o Handling API Responses and Errors

**• State Management Techniques**

o Provider, Riverpod, and GetX

o Managing Global State and Local State

o Understanding the BLoC Pattern

**• Persistent Storage in Flutter**

o Local Database with SQLite/Drift

o Using SharedPreferences and GetStorage

o Working with Files and Directories

Module 5: Advanced Flutter Concepts

**• Firebase Integration**

o Setting Up Firebase in a Flutter App

o Firebase Authentication (Email, Google Sign-In)

o Firebase Firestore for Realtime Data

o Firebase Cloud Messaging (Push Notifications)

**• Flutter and Device Features**

o Accessing Device Sensors (Camera, Location)

o Using Permissions (permission\_handler package)

o Handling File Uploads and Downloads

**• Platform-Specific Code**

o Writing Platform-Specific Code for iOS and Android

o Using Method Channels to Integrate Native Code

Module 6: Deployment and Distribution

**• Preparing Apps for Deployment**

o Creating Build Configurations (Debug, Release)

o App Icon and Splash Screen Customization

o Managing App Permissions and Configurations

**• Deploying Apps to the Play Store and App Store**

o Signing and Building APKs and App Bundles for Android

o Preparing iOS Builds for the App Store

o Handling App Store Submission Process

**• CI/CD for Flutter Apps**

o Setting Up CI/CD with GitHub Actions

o Automated Testing and Deployment

Module 7: Capstone Project

**• Building a Full-Fledged Flutter App**

o Project Planning and Feature Design

o API Integration and Real-time Data Handling

o State Management Implementation

o User Authentication and Cloud Storage Integration

**• Project Review and Enhancement**

o Code Optimization and Refactoring

o Testing and Debugging

o Deploying the Final Project to Stores

Learning Outcomes:

• Mastery of Dart programming for backend and mobile development.

• Ability to build, test, and deploy cross-platform mobile apps using Flutter.

• Understanding of state management, UI/UX design, and backend integration.

• Hands-on experience with real-world projects and Firebase services.

This syllabus covers both foundational and advanced concepts in Dart and Flutter, giving

students the skills they need to build professional mobile applications.