

Flutter Course Outline (12 Weeks / 3 Months)

 **Course Duration: 12 Weeks**

 **Target Audience:** Intermediate and early bachelor's students with basic programming knowledge

 **Goal:** Enable students to build, manage, and deploy full Flutter apps with Provider for state management and Firebase for backend services.

Week-by-Week Breakdown

Week 1: Introduction to Flutter & Dart Basics

- What is Flutter and why use it?
- Installing Flutter SDK and IDE (VS Code / Android Studio)
- Dart basics: variables, functions, conditionals, loops, collections, null safety
- Flutter project structure and hot reload

Assignment:

- Create two Dart programs: a basic calculator and a pattern generator
-

Week 2: Flutter Widgets – Fundamentals

- MaterialApp, Scaffold, AppBar, Center
- Text, Image, Icon, Button, Container, Row, Column, SizedBox
- Basic styling: colors, fonts, padding, alignment

Assignment:

- Create a personal profile UI using basic widgets and layout
-

Week 3: Layouts & Navigation

- Layouts: ListView, GridView, Stack, Expanded, Wrap, Card
- Navigation: Navigator.push/pop, named routes
- Drawer and BottomNavigationBar

Assignment:

- Build a multi-page app with named routes and bottom navigation
-

Week 4: Forms and Input Handling

- Form & TextField widgets
- TextEditingController, validators, and input formatting
- Checkbox, Radio, Switch widgets

Assignment:

- Create a login/signup UI with validation and input feedback
-

Week 5: State Management with setState

- Understanding Stateful Widgets
- Using setState for local state updates
- Passing data between screens

Assignment:

- Counter app with increment/decrement + light/dark theme toggle
-

Week 6: State Management with Provider

- Introduction to Provider
- ChangeNotifier & ChangeNotifierProvider
- Listening to and updating state
- Comparing Provider vs setState

Assignment:

- Rebuild the counter or todo app using Provider
-

Week 7: API Integration (RESTful Services)

- Using http package to fetch data
- Parsing JSON in Dart
- Displaying data with FutureBuilder
- Loading states and error handling

Assignment:

- Build a product list app fetching data from a dummy REST API
-

Week 8: Firebase Setup & Authentication

- Creating a Firebase project
- Firebase setup for Android and iOS
- Email/Password authentication with Firebase Auth
- Using Provider for Auth state management

Assignment:

- Firebase login/signup app with error handling and state control using Provider
-

Week 9: Firestore Database

- Firebase Firestore introduction
- CRUD operations with Firestore
- Displaying live data using StreamBuilder
- Integration with Firebase Authentication

Assignment:

- Notes App (CRUD operations with Firestore + Auth-based user data)

Week 10: Firebase Storage & Media

- Firebase Storage (uploading images/files)
- Displaying images from cloud storage
- Firebase Rules overview

Assignment:

- Enhance Notes App: upload an image with each note
-

Week 11: Local Storage and App Publishing

- SharedPreferences for local storage
- SQLite database with sqflite package
- App signing (debug vs release), APK/AAB generation
- Play Store publishing process overview

Assignment:

- Build a Todo app that stores tasks locally with SharedPreferences
-

Week 12: Final Project and Demos

✂ Final Project Options:

- E-commerce app (Firebase-backed)
- Chat interface (Firebase Auth + Firestore)
- Expense tracker with local and Firebase sync
- Student dashboard with login, profile, and courses



Project Presentation:

- Demo the app functionality
- Code walkthrough and GitHub submission
- APK generation and installable version

Course Deliverables

- ☒ At least 10 mini projects from weekly assignments
- ☒ 1 fully functional final app with GitHub repo
- ☒ APK or AAB generated
- ☒ Firebase integration experience
- ☒ Solid understanding of Provider for state management
- ☒ Certificate of completion / letter of recommendation.



Flutter Crash Course (2 Months / 8 Weeks)

 **Duration:** 8 Weeks (2 months)



Goal: Build and deploy full-featured mobile apps using Flutter, Provider, and Firebase



Target: Inter/early bachelor's students with basic programming background



Week-by-Week Breakdown

Week 1: Flutter & Dart Fundamentals + Widgets

- Flutter installation and setup (Flutter SDK + IDE)
- Dart essentials: variables, functions, lists, conditionals, loops, null safety
- Flutter app structure (MaterialApp, Scaffold)
- Basic widgets: Text, Image, Icon, Container, Row, Column, Button

Assignment:

- Create a personal profile UI using basic widgets
 - Write two Dart console programs: calculator + pattern generator
-

Week 2: Layouts, Navigation & Forms

- Layouts: Stack, ListView, GridView, Expanded, Card
- Navigation: push/pop, named routes, BottomNavigationBar
- Forms: TextField, Form widget, validation, user input

Assignment:

- Build a 3-screen app with bottom nav and forms (e.g., Contact Form)
-

Week 3: State Management – setState & Provider

- Stateful widgets & setState()

- Introduction to Provider
- Creating models with ChangeNotifier
- Using ChangeNotifierProvider and Consumer

Assignment:

- Build a counter app using both setState and Provider
 - Create a todo app with add/delete using Provider
-

Week 4: REST API Integration

- http package and JSON parsing
- Using FutureBuilder to display API data
- Error handling and loading indicators

Assignment:

- Build a Product List app fetching data from an open REST API (e.g., fakestoreapi)
-

Week 5: Firebase Setup & Authentication

- Firebase project setup (Android only for speed)
- Email/password authentication
- Auth state management with Provider

Assignment:

- Create login/signup app using Firebase Auth + Provider
-

Week 6: Firebase Firestore & CRUD

- Firestore basics: structure, collections, documents
- Create, Read, Update, Delete (CRUD) operations
- Display real-time data with StreamBuilder

Assignment:

- Build a Notes App using Firebase Auth + Firestore (each user sees their notes)
-

Week 7: Firebase Storage + Local Storage

- Upload and display images using Firebase Storage
- Intro to SharedPreferences for local persistence
- Optional: SQLite with sqflite

Assignment:

- Enhance the Notes App to include images
 - Build a simple local todo app with SharedPreferences
-

Week 8: Final Project + Presentation

Final Project Ideas (Choose One):

- Mini E-commerce app (list, cart, checkout UI)
- Chat interface with Firebase (Auth + Firestore)
- Expense tracker (local + Firebase backup)
- Student dashboard (login, profile, course list)

Deliverables:

- Fully functional app with Firebase + Provider
 - APK generation (debug or release)
 - GitHub submission
 - Presentation/demo to mentor or peers
-

Crash Course Outcomes

-  Proficiency in Flutter basics and UI design
-  REST API and Firebase integration
-  Clean architecture with Provider

- ☒ Final project deployed or APK-ready
 - ☒ Resume & GitHub portfolio entry
-