

Flutter Development

Module 1: Introduction to Mobile App Development

- Introduction to mobile app development
- Native vs Cross-platform development
- Introduction to Flutter
- Understanding Dart
- Installing Flutter SDK
- Setting up Android Studio / VS Code
- Creating first Flutter app
- Project structure overview

Practical:

- Run first “Hello World” Flutter App

Module 2: Dart Programming Fundamentals

- Variables and Data Types
- Functions
- Control statements (if, switch, loops)
- Lists, Maps, Sets
- Classes and Objects
- Constructors
- Null safety
- Asynchronous programming (Future, async/await)

Practical:

- Small Dart programs
- Logic exercises

Module 3: Flutter Basics

- Flutter widgets concept
- Stateless vs Stateful widgets
- Material Design widgets
- Layout widgets (Row, Column, Container)
- Text, Image, Icon widgets
- Buttons and user input
- Navigation and routing

• Practical:

- Build simple UI screens
- Multi-screen navigation app

Module 4: UI Design in Flutter

- Layout design techniques
- Responsive UI
- ListView and GridView
- Cards and custom UI
- Themes and styling
- Custom widgets
- MediaQuery and device responsiveness

Practical Project:

- E-commerce UI design
- Social media UI

Module 5: Forms & User Input

- TextField & controllers
- Form validation
- Dropdowns, checkboxes, radio buttons
- Date picker and dialogs
- Input formatting

Practical:

- Registration & login form

Module 6: State Management

- setState
- Provider
- Riverpod / Bloc overview
- State management best practices

Practical:

- Counter app using Provider
- Todo list app

Module 7: API Integration

- REST API basics
- HTTP requests
- JSON parsing
- Loading indicators
- Error handling

Practical:

- Fetch data from public API
- News app or weather app

Module 8: Local Storage

- SharedPreferences
- SQLite database
- Local caching

Practical:

- Save user settings
- Offline data storage

Module 9: Firebase Integration

- Introduction to Firebase
- Firebase authentication
- Cloud Firestore database
- Push notifications
- Firebase storage

Practical:

- Login with Firebase
- Chat or notes app

Module 10: Advanced Flutter Concepts

- Animations
- Custom themes
- Dark mode
- Performance optimization
- Package management (pub.dev)
- Debugging

Module 11: App Deployment

- Build APK / AAB
- App signing
- Publishing to Google Play Store
- Basic overview of Apple App Store

Module 12: Live Project

- Students will build a complete app such as:

- Examples:
- Food delivery app
- E-commerce app
- Task management app
- Event booking app

- Includes:
- UI design
- API integration
- Firebase authentication
- Deployment

- Tools Students Will Learn
- Android Studio
- VS Code
- Git & GitHub
- Postman
- Firebase