

Certified Flutter Application Development

Course Duration: 24 Hours

Course code: CFAD

1. Course Overview

This course provides participants with the skills to design, build, and deploy cross-platform mobile applications using Flutter and Dart. It covers Flutter fundamentals, UI design, state management, API integration, Firebase services, and deployment to app stores. By the end of the course, participants will be able to build scalable, responsive, and high-performance apps for both Android and iOS platforms.

2. What you'll learn?

- Understand Flutter architecture and the Dart programming language.
- Build and style cross-platform mobile UIs with widgets.
- Manage state using Provider, Riverpod, or Bloc.
- Integrate REST APIs and work with JSON data.
- Use Firebase for authentication, database, and push notifications.
- Debug, test, and optimize Flutter applications.
- Deploy Flutter apps to Google Play Store and Apple App Store.

3. Target Audience

- Mobile App Developers (Android/iOS)
- Web Developers looking to transition into mobile app development
- Students and IT professionals interested in cross-platform app development
- Anyone preparing for a Flutter certification exam

4. Pre-Requisites

- Basic knowledge of programming (Java, JavaScript, Python, or similar)

- Familiarity with OOP (Object-Oriented Programming) concepts
- No prior experience with Dart or Flutter required

5. Course content

Module 1: Introduction to Flutter and Dart

- What is Flutter and why use it?
- Installing Flutter SDK and setting up IDEs (Android Studio, VS Code)
- Dart programming fundamentals (variables, loops, functions, classes)
- Running your first Flutter app

Module 2: Flutter Widgets and UI Design

- Stateless vs Stateful widgets
- Material Design and Cupertino widgets
- Layouts: Row, Column, Stack, ListView, GridView
- Styling apps with themes, fonts, and colors
- Building responsive and adaptive UIs

Module 3: Navigation and Routing

- Navigation basics (push, pop, named routes)
- Passing data between screens
- Drawer, Bottom Navigation Bar, and Tab Navigation
- Deep linking and navigation best practices

Module 4: State Management in Flutter

- Understanding stateful architecture
- Provider and ChangeNotifier
- Riverpod and Bloc patterns
- Best practices for managing complex app state

Module 5: Working with Data and APIs

- Fetching JSON data from REST APIs
- Parsing and displaying data in widgets
- Handling HTTP requests and error states
- Offline storage (SQLite, Hive, Shared Preferences)

Module 6: Firebase Integration

- Setting up Firebase with Flutter
- Firebase Authentication (Email, Google, Facebook login)
- Firestore Database for real-time apps
- Push Notifications with Firebase Cloud Messaging (FCM)
- Analytics and Crashlytics integration

Module 7: Debugging, Testing, and Optimization

- Debugging tools and techniques in Flutter
- Unit testing, widget testing, and integration testing
- Performance optimization (lazy loading, async programming)
- Handling app lifecycle and memory management

Module 8: Deploying Flutter Applications

- Preparing Android and iOS apps for release
- Signing APKs and App Bundles for Google Play
- iOS provisioning, signing, and App Store deployment
- Continuous Integration/Continuous Deployment (CI/CD) basics

Module 9: Advanced Flutter Features (Optional/Extended)

- Using animations and custom widgets
- Working with device features (camera, GPS, sensors)
- Integration with GraphQL APIs
- Multi-platform development (Web, Desktop, Embedded with Flutter)

Module 10: Capstone Project and Certification Prep

- Building a complete Flutter app from scratch
- Best practices for scalable app architecture
- Certification exam tips and mock tests
- Final project presentation and review

