

Master Flutter Mobile Application Development

Course Duration: 56 Hours

Course code: MFMAD

1. Course Overview

This advanced course enables participants to master cross-platform mobile application development with Flutter and Dart. It begins with Flutter fundamentals and progresses to advanced concepts like state management, animations, API integration, Firebase services, testing, deployment, and advanced performance tuning. Participants will work on real-world projects to build scalable, high-performance mobile applications for Android and iOS.

2. What you'll learn?

- Master Flutter architecture and Dart programming.
- Build advanced UI/UX using widgets, animations, and custom components.
- Implement complex state management using Provider, Riverpod, and Bloc.
- Integrate REST APIs, GraphQL, and real-time databases.
- Use Firebase for authentication, storage, push notifications, and analytics.
- Apply advanced debugging, testing, and CI/CD practices.
- Deploy production-ready apps to Google Play and the Apple App Store.
- Develop capstone projects showcasing enterprise-grade mobile solutions.

3. Target Audience

- Mobile Developers (Android/iOS) aiming to transition into Flutter.
- Full-Stack and Web Developers seeking cross-platform skills.
- IT professionals preparing for Flutter certification and enterprise projects.
- Students and aspiring app developers who want to master Flutter development.

4. Pre-Requisites

- Basic programming experience (Java, JavaScript, Python, or similar).
- Familiarity with Object-Oriented Programming (OOP).
- Prior experience with Flutter basics is helpful but not mandatory.

5. Course content

Module 1: Getting Started with Flutter and Dart

- Flutter SDK setup and IDE configuration
- Dart refresher: variables, collections, functions, OOP
- Running your first Flutter project
- Flutter project structure explained

Module 2: Building Responsive UIs

- Core Flutter widgets (Stateless vs Stateful)
- Layouts: Row, Column, Stack, ListView, GridView
- Themes, styles, and responsive design
- Building adaptive UIs for multiple devices

Module 3: Navigation and Routing

- Navigation basics: push, pop, named routes
- Passing data between screens
- Drawer, TabBar, and Bottom Navigation Bar
- Advanced navigation with deep linking and Navigator 2.0

Module 4: Advanced State Management

- Local state vs app-wide state
- Provider and ChangeNotifier patterns
- Bloc (Business Logic Component)
- Riverpod for scalable state management
- Best practices for large-scale projects

Module 5: Working with Data and APIs

- HTTP package and REST API integration
- JSON serialization and deserialization
- Consuming GraphQL APIs
- Offline data storage (SQLite, Hive, Shared Preferences)

Module 6: Firebase and Cloud Integration

- Firebase Authentication (Email, Google, Social Logins)
- Firestore database for real-time apps
- Cloud Storage for media and files
- Push Notifications with Firebase Cloud Messaging
- Analytics and Crashlytics for monitoring

Module 7: Animations and Advanced UI

- Implicit vs Explicit animations
- Custom animations and transitions
- AnimatedBuilder and Hero animations
- Designing visually engaging and smooth UX

Module 8: Debugging, Testing, and Optimization

- Debugging tools and error handling
- Unit, widget, and integration testing
- Performance optimization (lazy loading, isolates, async)
- Memory management and app lifecycle handling

Module 9: Deployment and CI/CD

- Preparing apps for production release
- Signing and publishing apps on Google Play and App Store
- App Store guidelines and compliance

- Continuous Integration/Continuous Deployment with GitHub Actions / Bitrise

Module 10: Advanced Features and Integrations

- Accessing device features (camera, GPS, sensors, Bluetooth)
- Payment gateway integration (Stripe, Razorpay, PayPal)
- Using third-party packages effectively
- Flutter for Web and Desktop (overview)

