

# **Master Flutter Mobile Application Development ( Day Wise )**

**Duration:** 7 days

**Prerequisites:** Knowledge of Mobile Application Development

## **Day 1 – Dart Foundations & OOP**

**Objective:** Build a solid base in Dart for Flutter development.

- Why Dart for Flutter? Setup & environment.
  - Dart basics: variables, data types, operators, control flow.
  - Collections (Lists, Sets, Maps).
  - Functions, lambdas, and scope.
  - Object-Oriented Programming: classes, objects, inheritance, encapsulation, abstract classes.
  - **Lab:** Create a “To-Do List” CLI app (with Dart OOP).
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## **Day 2 – Flutter Fundamentals & Widgets**

**Objective:** Learn Flutter basics and core widgets.

- Flutter architecture, SDK, tools setup.
  - StatelessWidget vs StatefulWidget.
  - Basic UI widgets: Text, Image, Container, Row, Column, Scaffold.
  - Material & Cupertino widgets.
  - Input controls: TextField, Buttons, Checkbox, Radio, Stack.
  - **Lab:** Build a “Hello Flutter” app with custom UI using Material Design.
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## **Day 3 – UI Composition, Forms & Navigation**

**Objective:** Develop complex UIs and navigation.

- Advanced widgets: ListView, GridView, Card, Stack, SnackBar, Slider, TabBar, BottomNavBar, Slivers.
  - Forms & validation.
  - Navigation: Navigator, named routes, route management.
  - **Lab:** Create a shopping app UI with product list, detail page, and navigation.
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## **Day 4 – Networking & Local Storage**

**Objective:** Work with external data and persistence.

- HTTP requests: GET, POST, PUT, DELETE.
  - Using http package for API integration.
  - JSON parsing.
  - SQLite integration for local storage.
  - **Lab:** Build an app that fetches API data, displays list items, and saves favorites locally.
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## Day 5 – Animations, Error Handling & Security

**Objective:** Enhance user experience and security.

- Animations: Implicit (AnimatedContainer, AnimatedOpacity), Explicit (AnimationController).
  - Error handling: try-catch, error widgets, logging.
  - Security: secure storage, input validation, token-based API authentication.
  - **Lab:** Extend API app with animations, error-handling wrappers, and token-based secure calls.
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## Day 6 – Advanced Flutter & Performance

**Objective:** Optimize apps and follow best practices.

- Performance optimization: DevTools, lazy loading (ListView.builder), reducing rebuilds.
  - Best practices: modularization, reusable widgets, theming & styling.
  - **Lab:** Optimize the shopping app with performance profiling and consistent theming.
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## Day 7 – Maps, Geolocation & Capstone Project

**Objective:** Apply all concepts in a final integrated project.

- Google Maps SDK setup & integration.
- Adding markers, customizing maps, geolocation & routes.
- Capstone Project:
  - Authentication with token storage
  - API integration
  - Local data storage
  - Maps feature with user location
- Deployment basics: APK signing, app bundles.
- **Lab:** Develop and demo a feature-rich capstone app.