

Flutter Complete Syllabus (Basic to Expert)

University / Industry Oriented Syllabus

Chapter 1: Introduction to Flutter

- Flutter overview and ecosystem
- Flutter architecture
- Flutter vs Native & other frameworks
- SDK, tooling and project structure
- Hot Reload and Hot Restart

Chapter 2: Dart Programming Language

- Dart syntax and fundamentals
- Variables, data types and operators
- Control flow statements
- Functions and closures
- OOP concepts in Dart
- Null safety
- Collections
- Asynchronous programming (Future, async/await, Stream)

Chapter 3: Flutter Fundamentals

- Widgets and widget tree
- Stateless and Stateful widgets
- Build method and BuildContext
- MaterialApp and Scaffold
- Widget lifecycle
- Keys (basic to intermediate)

Chapter 4: UI and Layout Widgets

- Basic widgets (Text, Container, Image, Icon)
- Layout widgets (Row, Column, Stack)
- Expanded, Flexible, Wrap
- MediaQuery and LayoutBuilder
- Responsive design principles

Chapter 5: User Interaction and Forms

- TextField and controllers
- Form and validation
- Focus and keyboard handling
- GestureDetector and InkWell

Chapter 6: Lists and Scrolling

- ListView and GridView
- Builder patterns
- Custom list items
- Pagination basics

Chapter 7: Navigation and Routing

- Navigator push/pop
- Passing data between screens
- Named routes
- Navigation best practices

Chapter 8: State Management Basics

- State concepts
- setState
- Widget lifecycle methods
- Local vs global state

Chapter 9: Local Storage

- SharedPreferences
- Session management
- Secure storage basics

Chapter 10: SQLite Database

- SQLite fundamentals
- sqflite package
- CRUD operations
- Database versioning

Chapter 11: Floor Database (Room Equivalent)

- Floor architecture
- Entity and DAO
- Queries and annotations
- Database creation
- Migrations and relations

Chapter 12: Networking and API Integration

- REST API concepts
- HTTP methods
- http package

- JSON parsing
- Error handling and pagination

Chapter 13: State Management with Riverpod

- Riverpod overview
- Provider types
- StateNotifier
- Async state handling
- Riverpod with API and database

Chapter 14: Application Architecture

- Repository pattern
- MVVM architecture
- Clean architecture
- Dependency Injection (get_it)

Chapter 15: Performance Optimization

- const widgets
- Reducing rebuilds
- Flutter DevTools
- Memory optimization

Chapter 16: Animations

- Implicit animations
- Explicit animations
- AnimationController and Tween
- Hero animations

Chapter 17: Platform Integration

- Camera and gallery
- Location services
- Permissions
- File handling

Chapter 18: Firebase Integration

- Firebase setup
- Authentication
- Firestore
- Push notifications
- Security rules basics

Chapter 19: Testing and Debugging

- Debugging tools
- Unit testing
- Widget testing
- Error handling strategies

Chapter 20: Build and Deployment

- Build variants
- APK and AAB generation
- Play Store publishing
- Versioning

Chapter 21: Advanced and Expert Topics

- Isolates
- Background tasks
- Custom render objects (intro)
- Scalable app development
- Production bug fixing
- Code review practices