Full Stack Mobile Application Development with Advanced React Native

Course Duration: 64 Hours **Course code: FSMAD-ARC**

1. Course Overview

This course is designed to help learners master full stack mobile app development by leveraging the power of Advanced React Native for cross-platform mobile applications and Node.js with Express.js for backend APIs. The program goes beyond the basics of React Native and introduces advanced concepts such as animations, performance optimization, native module integration, offline-first apps, advanced navigation, and real-time communication. Learners will also gain practical experience with cloud deployment, CI/CD pipelines, and App Store/Play Store publishing.By the end of the course, participants will be able to build, optimize, and deploy enterprise-grade mobile applications with scalable backends.

2. What you'll learn?

By the end of this course, learners will be able to:

- Understand full stack mobile development architecture with React Native + Node.js.
- Work with advanced React Native features including animations, gestures, and native modules.
- Design scalable backend APIs with Node.js, Express, and databases.
- Implement secure authentication and authorization (JWT, OAuth, Biometric Auth).
- Optimize React Native apps for performance and offline-first usage.
- Build real-time apps with WebSockets/GraphQL subscriptions.
- Use TypeScript in React Native for large-scale applications.
- Integrate with cloud services (Firebase, AWS, Azure).
- Set up CI/CD pipelines for automated builds and deployments.

- Publish apps to Google Play Store and Apple App Store.

3. Target Audience

- Mobile developers who want to advance into enterprise-level app development.
- React/JavaScript developers looking to master React Native.
- Backend developers wanting to extend skills into full stack mobile development.
- Professionals aiming to become Full Stack Mobile Engineers.

4. Pre-Requisites

Familiarity with:

- JavaScript/ES6 and React.js fundamentals.
- Basic knowledge of React Native (components, navigation, state).
- Understanding of Node.js/Express.js basics and database concepts.

5. Course content

Day 1: Node.js & Express – REST API Foundations

Theory (2.5 hrs)

- Node.js architecture, non-blocking I/O
- RESTful concepts, HTTP methods, Express intro

Hands-on (5.5 hrs)

- Create a REST API using Express
- Setup basic routes (GET, POST)
- Use middleware, Postman testing

Day 2: Routing, Middleware, and Stateless Auth

Theory (3.0 hrs)

- Express Router, middleware, request lifecycle

- API validation, parsing JSON/form data

Hands-on (5.0 hrs)

- Modularize routes (/users, /auth)
- Implement middleware (logger, validator)
- Build a basic login/signup flow (no DB)

Day 3: MongoDB Integration & Secure Authentication

Theory (3.0 hrs)

- Mongoose schemas, MongoDB Atlas
- JWT Authentication, CORS, Helmet

Hands-on (5.0 hrs)

- Register/login with hashed password
- Protect /dashboard with token middleware
- Store users in MongoDB with Mongoose

Day 4: Advanced Backend Features & Deployment

Theory (2.5 hrs)

- Pagination, filtering, sorting for mobile APIs
- Env variables, API versioning, deployment options

Hands-on (5.5 hrs)

- Filtered tasks endpoint
- Deploy to Render/Railway
- Final Backend Project: CRUD + JWT + filtering

Day 5: Firebase for Mobile Integration

Theory (3.0 hrs)

- Firebase overview (Auth, Firestore, Storage)

- Firebase Functions, CLI, Hosting

Hands-on (5.0 hrs)

- Firebase Auth (Email/Password)
- Firestore CRUD integration with mobile app
- Upload images, setup Firestore security
- Deploy a Firebase Cloud Function

Day 6: Advanced React Native – Performance & Memory

Theory (2.5 hrs)

- Performance bottlenecks, FlatList optimization
- Memory profiling, Hermes, Flipper

Hands-on (5.5 hrs)

- Use FastImage, Flipper, optimize re-renders
- Compare Hermes on/off performance
- Improve responsiveness in large lists

Day 7: Native Device Features, Animations & Gestures

Theory (2.5 hrs)

- Reanimated 2, Gesture Handler
- Device APIs: Camera, GPS, Biometrics, Background tasks

Hands-on (5.5 hrs)

- Build gesture-based UI
- Use react-native-keychain, react-native-maps, expo-camera
- Implement background fetch and permission handling

Day 8: Real-time Features, Notifications & Security

Theory (3.0 hrs)

- WebSocket vs Firebase real-time
- Push notifications (FCM), secure storage, CI/CD overview

Hands-on (5.0 hrs)

- Real-time chat with Firebase/Socket.IO
- Setup FCM push notifications
- Secure local data with react-native-encrypted-storage
- Configure GitHub Actions + OTA updates via CodePush