Advanced React Native

Duration: 3 days
Prerequisites: Working Knowledge of React Native

Day 1: App Performance Optimization & Memory Management

Theory (2.5 hrs)

- Optimizing FlatList, SectionList, VirtualizedList
- Avoiding unnecessary re-renders (React.memo, useCallback, useMemo)
- JS Thread vs UI Thread vs Native Thread
- Debugging and profiling using Flipper & Hermes
- Memory leaks and garbage collection

Hands-on (5.5 hrs)

- Optimize list rendering using memoization
- Use react-native-fast-image for optimized image rendering
- Profile app using Flipper: memory, CPU, network
- Compare Hermes on/off performance

Day 2: Animations, Gestures, and Device Feature Access

Theory (2.5 hrs)

- Advanced Animations: Reanimated 2 and Gesture Handler
- Building fluid UIs with shared values and animations
- Accessing device features:
  - Camera, GPS, Microphone
  - Biometric Authentication
  - Permissions (Android/iOS differences)
  - Sensors (Accelerometer, Gyroscope)
  - Background tasks (with react-native-background-fetch)

Hands-on (5.5 hrs)

- Build a fluid card swipe animation using Reanimated 2
- Use react-native-maps + react-native-geolocation for GPS tracking
- Integrate Biometric Auth with react-native-keychain
- Access Camera using react-native-image-picker or expo-camera
- Request and manage runtime permissions
- Record motion data using react-native-sensors
- Set up background fetch task for polling updates

Day 3: Real-time Features, Notifications & Security

Theory (3.0 hrs)

- Real-time data strategies: Firebase vs WebSockets
- Push Notification workflows (Local + Remote with FCM)
- Secure storage practices (tokens, secrets)
- App hardening & code obfuscation techniques
- CI/CD overview for production-grade deployments

Hands-on (5.0 hrs)

- Implement real-time chat or alerts using Firebase or Socket.IO
- Setup and test push notifications using FCM / Expo
- Secure sensitive data using react-native-encrypted-storage
- Configure OTA (over-the-air) updates using CodePush
- Deploy app via CI pipeline using GitHub Actions + Fastlane