Complete Mobile App Development using MERN Stack: Android & iOS

Duration: 6 Months (24 Weeks)
Mode: Live Classes

Module 1: Introduction to Mobile App Development and MERN Stack

Week 1:

- Course Introduction and Overview
- Understanding Mobile App Development: Native vs. Hybrid vs. Cross-Platform
- Overview of MERN Stack (MongoDB, Express.js, React Native, Node.js)
- Setting Up the Development Environment: Installation and Configuration
    - Android Development on Windows
    - iOS Development with Expo (without a Mac)
- Introduction to Git and Version Control

Week 2:

- Basics of JavaScript and ES6+ Features
- Introduction to Node.js and npm
- Setting Up a Basic Node.js Server
- Introduction to MongoDB: Basics and Installation
- Connecting Node.js with MongoDB using Mongoose

Module 2: Backend Development with Node.js and Express.js

Week 3:

- Deep Dive into Node.js: Event Loop, Modules, and Asynchronous Programming
- Building RESTful APIs with Express.js
- Routing and Middleware in Express.js
- Handling HTTP Requests and Responses
- Connecting to MongoDB: CRUD Operations with Mongoose

Week 4:

- Authentication and Authorization: Passport.js and JWT
- Securing API Endpoints
- Building a User Authentication System (Signup, Login, Logout)
- Session Management and Cookies
- Introduction to Role-Based Access Control (RBAC)

Week 5:

- File Uploads and Image Handling in Express.js
- Data Validation and Error Handling in APIs
- Pagination, Filtering, and Sorting in API Responses
- Integrating Third-Party APIs and Services
- Building a REST API for a Mobile App Backend

Week 6:

- Testing APIs with Postman
- Writing Unit and Integration Tests for Node.js Applications
- Continuous Integration and Continuous Deployment (CI/CD) Basics
- Deploying Node.js Applications to Cloud Platforms like, DigitalOcean or Hostinger
- Project: Develop a Complete RESTful API for a Real-World Mobile App

Module 3: Frontend Development with React Native

Week 7:

- Introduction to React Native: Overview and Core Concepts
- Setting Up the React Native Development Environment (using Expo)
- Building Your First React Native App: Hello World (for Android and iOS)
- Understanding React Components, JSX, and Props
- State Management Basics with React's useState Hook

Week 8:

- React Navigation: Stack, Tab, and Drawer Navigation
- Handling User Input with Forms in React Native
- Managing State with useContext and useReducer Hooks
- API Integration in React Native: Fetching Data from the Backend
- Building Dynamic UI Components and Lists

Week 9:

- Styling in React Native: Flexbox, StyleSheet, and Theme Customization
- Responsive Design and Device Compatibility
- Advanced State Management with Redux and Redux Toolkit
- Connecting Redux with React Native Components
- Handling Side Effects with Redux Thunk and Redux-Saga

Week 10:

- Authentication in React Native: Handling User Sessions and Tokens
- Implementing Social Login (Google, Facebook) in React Native
- Offline Storage and Data Sync with AsyncStorage and SQLite
- Push Notifications and Real-Time Updates
- Integrating Native Modules and Plugins (Camera, Location, etc.)

Week 11:

- Testing React Native Apps: Unit Testing with Jest and React Native Testing Library
- Debugging and Performance Optimization in React Native
- Continuous Integration and Deployment for React Native Apps
- Building and Publishing the App to Google Play Store and Apple App Store
- Project: Develop a Complete Frontend for the Mobile App

Module 4: Full-Stack Mobile App Development Project

Weeks 12-14:

- Project Planning and Requirement Analysis
- Setting Up the Project Structure: Backend and Frontend
- Implementing Authentication and Authorization
- Designing and Implementing the Database Schema

Weeks 15-17:

- Developing Core Features: User Profiles, Posts, Comments, and Notifications
- Implementing Real-Time Features: Chat, Live Updates
- Integrating Third-Party APIs (e.g., Payment Gateway, Social Media Integration)
- Implementing Push Notifications and Background Tasks

Weeks 18-20:

- Testing the Full-Stack Application (Backend and Frontend)
- Performance Optimization and Code Refactoring
- Deploying the Full-Stack Application to Cloud Platforms
- Final Project Presentation and Review
- Submission of Final Project Report and Documentation

Module 5: Advanced Topics and Capstone Project

Week 21:

- Advanced Database Concepts: Indexing, Aggregation, and Transactions
- Implementing Microservices with Node.js
- GraphQL Basics and Integration with React Native

Week 22:

- **Server-Side Rendering (SSR) and Next.js Overview:**
    - Understanding SSR and its benefits in mobile backend APIs.
    - Integration with Next.js for server-side rendering in mobile applications using a web backend.
    - Implementing SSR to optimize mobile app performance, particularly in web views or PWA components.

- **Building a Progressive Web App (PWA) alongside Mobile App:**
    - Understanding the concept and benefits of PWAs in conjunction with mobile apps.
    - Techniques for turning your React Native app into a PWA using web technologies.
    - Handling offline capabilities and background synchronization in PWAs.

Week 23:

- **Exploring Alternatives to MERN Stack in Mobile Development:**
  - A comparative study of Flutter vs. React Native: Pros and cons, when to use each.
  - The advantages and disadvantages of using Firebase as an alternative backend for mobile apps.
  - Understanding how to implement critical features such as real-time databases, authentication, and hosting using Firebase with React Native.

- **Understanding DevOps and CI/CD for Mobile Apps:**
  - Setting up CI/CD pipelines for automated testing and deployment of mobile apps.
  - Integrating services like GitHub Actions, Jenkins, or CircleCI for automated mobile app builds.
  - Docker and Kubernetes for containerizing your mobile backend services.

Week 24:

- **Capstone Project: Build and Deploy a Complete Cross-Platform Mobile App (Android & iOS) Using MERN Stack:**
  - Final project work where students build and deploy a fully functional cross-platform mobile app, integrating all the technologies and best practices learned throughout the course.
  - The project should be deployable to both Google Play Store and Apple App Store.

- **Project Presentation and Code Review:**
  - Students present their final projects, showcasing their mobile apps.
  - Detailed code review and feedback from instructors, focusing on best practices, code quality, and optimization.

- **Career Guidance:**
    - Preparing for job interviews, building a strong portfolio showcasing mobile apps, and tips for a successful career in mobile app development.
    - Networking strategies and leveraging the course's project work to find job opportunities.
- **Final Course Recap and Q&A Session:**
    - Recap of all the key learnings from the course.
    - Open Q&A session for any remaining questions, clarifications, or additional guidance.
- **Certification and Course Completion Ceremony:**
- Awarding certificates to students who successfully complete the course.
- Discussing next steps for continued learning and professional development.

Course Deliverables:

- **Live Coding Sessions and Demonstrations:** Detailed walkthroughs and live coding sessions to enhance learning.
- **Monthly Assignments and Quizzes:** To reinforce concepts and track progress.
- **Mid-Course and Final Projects:** Practical projects designed to provide hands-on experience.
- **Access to Course Material and Recordings:** All sessions recorded for review and self-paced learning.
- **Certificate of Completion:** Provided to students who successfully complete the course and projects.

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Target Audience:

- **Aspiring Mobile App Developers:** Individuals looking to enter the field of mobile development.
- **Web Developers Transitioning to Mobile Development:** Those familiar with web development who want to extend their skills to mobile platforms.
- **Students and Professionals Seeking Full-Stack Mobile Development Skills:** Those who want to develop cross-platform mobile applications using the MERN stack.

Tools and Technologies Covered:

- **MongoDB, Express.js, React Native, Node.js:** Core technologies in the MERN stack for mobile development.
- **Mongoose, Passport.js, JWT:** Essential tools for backend development and security.
- **Expo for React Native:** Simplified mobile app development with cross-platform capabilities.
- **CI/CD Tools:** GitHub Actions, Docker, Kubernetes for automating builds and deployments.
- **Testing Tools:** Postman for API testing, Jest and Detox for unit and end-to-end testing in mobile apps.

Why Join Our Course?

1. **200+ Hours of Live Content:**
   Interactive sessions with industry experts
2. **200+ Hours of Pace Learning Content:**
   Self-paced modules for in-depth understanding.
3. **Exclusive Access to CodeGPT:**
   Utilize ChatGPT premium access for coding support.
4. **Premium Job Portal Access:**
   Connect with top employers and enhance your job opportunities.
5. **CodeSearch & CodeLabs Platforms:**

   Streamline your coding journey with resources for two capstone projects.