

# MERN React Full Stack Web Developer

**Course Duration: 120 Hours**

**Course code: MERN-FSWD**

## 1. Course Overview

This course is designed to help learners become proficient in building end-to-end web applications using the MERN stack (MongoDB, Express.js, React, Node.js). The training covers everything from frontend development with React to backend API development with Node.js/Express, and database integration with MongoDB. Learners will also work on authentication, deployment, state management, and REST/GraphQL APIs to build production-ready applications. By the end of the course, participants will have the skills to design, develop, and deploy full-stack web applications using modern JavaScript technologies.

## 2. What you'll learn?

**By the end of the course, you will be able to:**

- Understand the MERN stack architecture and ecosystem.
- Build interactive UIs with React.js.
- Manage state using React Hooks and Context API (or Redux).
- Develop backend services and REST APIs with Node.js and Express.js.
- Integrate applications with MongoDB database.
- Implement user authentication and authorization (JWT, OAuth).
- Connect frontend and backend seamlessly.
- Deploy full-stack applications to cloud platforms (Heroku, AWS, Vercel, Netlify).
- Apply best practices in debugging, testing, and performance optimization.

## 3. Target Audience

- Aspiring Full Stack Web Developers
- JavaScript Developers wanting to go full stack

- Backend/Frontend developers upgrading to MERN stack
- Students or professionals interested in modern web app development

## 4. Pre-Requisites

### Familiarity with:

- Basic JavaScript, HTML, CSS
- Fundamentals of Web Development
- Understanding of client-server architecture

## 5. Course content

### Module 1: Introduction to MERN Stack

- Overview of Full Stack Development
- What is MERN? (MongoDB, Express, React, Node.js)
- Setting up the Development Environment

### Module 2: React.js Fundamentals

- JSX and Components
- Props and State
- React Hooks (useState, useEffect, useRef)
- Event Handling and Forms
- Conditional Rendering and Lists

### Module 3: Advanced React.js

- React Router (Navigation & Routing)
- Context API and Redux for State Management
- API Integration with Fetch/Axios
- Error Boundaries and Suspense
- React Performance Optimization

## **Module 4: Node.js and Express.js**

- Introduction to Node.js Runtime
- Express.js Framework Basics
- Building RESTful APIs
- Middleware and Routing
- Error Handling in Express

## **Module 5: MongoDB for Developers**

- Introduction to NoSQL and MongoDB
- CRUD Operations (Create, Read, Update, Delete)
- Schema Design with Mongoose
- Indexing and Aggregation
- Connecting MongoDB with Node.js

## **Module 6: Connecting Frontend and Backend**

- Fetching Data from Express APIs in React
- Sending Data to the Backend
- Handling Async/Await and Promises
- Real-world Data Flow in MERN Applications

## **Module 7: Authentication and Security**

- User Registration and Login
- JWT-based Authentication
- Password Hashing with bcrypt
- Role-based Authorization
- Securing APIs and CORS

## **Module 8: Advanced Features in MERN Apps**

- File Uploads (Multer / Cloudinary)
- Sending Emails from Node.js

- WebSockets for Real-Time Apps (Chat, Notifications)
- GraphQL with Apollo Server and Client (Optional)

### **Module 9: Testing and Debugging**

- Debugging Node.js and React Apps
- Unit Testing with Jest/Mocha
- API Testing with Postman
- End-to-End Testing Basics

### **Module 10: Deployment and DevOps Basics**

- Preparing Apps for Production
- Deploying MERN Apps on Heroku / Vercel / Netlify / AWS
- Environment Variables and Secrets
- CI/CD Overview

### **Module 11: Final Project – Full Stack MERN Application**

- Designing a Project (e.g., E-commerce / Social Media App / Task Manager)
- Building Frontend with React
- Creating Backend APIs with Node & Express
- Integrating MongoDB Database
- Implementing Authentication & Security
- Deploying to Cloud

### **Module 12: Wrap-Up and Best Practices**

- MERN Stack Development Best Practices
- Scalability Considerations
- Career Paths and Certifications in Full Stack Development
- Next Steps for Advanced Learning

