

MERN Stack Development

Complete Course Syllabus

MongoDB | Express.js | React.js | Node.js

Duration: 12 Weeks | Mode: Online + Offline | Level: Beginner to Advanced

Course Overview

This comprehensive 12-week MERN Stack Development course is designed to take you from a complete beginner to a confident Full Stack Developer. You will learn to build modern, scalable web applications using MongoDB, Express.js, React.js, and Node.js. The course includes 5+ real-world projects, live coding sessions, and industry-ready deployment practices.

Duration	12 Weeks (3 Months)	Mode	Online + Offline
Level	Beginner to Advanced	Certificate	Yes
Projects	5+ Real-World Projects	Support	Doubt Sessions + Community

Skills You Will Learn

HTML5, CSS3, JavaScript (ES6+)	React.js (Hooks, Router, Redux)	Node.js & Express.js
MongoDB & Mongoose ODM	REST API Development	Authentication (JWT, OAuth)
Git & GitHub Version Control	Deployment (Vercel, Render, AWS)	Responsive Web Design
State Management (Context, Redux)	Real-time Apps (Socket.io)	Testing & Debugging

Detailed Week-by-Week Curriculum

Week 1-2: Web Fundamentals

- HTML5 - Semantic elements, Forms, Tables, Multimedia
- CSS3 - Flexbox, Grid, Animations, Transitions, Media Queries
- JavaScript Basics - Variables, Data Types, Operators, Loops
- DOM Manipulation & Event Handling
- Responsive Design principles & Mobile-first approach

Mini Project: Personal Portfolio Website

Week 3-4: Advanced JavaScript & ES6+

- ES6+ Features - Arrow Functions, Destructuring, Spread/Rest
- Promises, Async/Await, Fetch API
- Array Methods - map, filter, reduce, forEach
- Closures, Hoisting, Scope Chain, this keyword
- Modules (import/export), Classes & Prototypes
- Error Handling, Debugging techniques

Mini Project: Interactive Quiz App

Week 5-6: React.js - Frontend Framework

- React Introduction - JSX, Components, Props
- State Management with useState, useEffect
- React Router - Navigation, Dynamic Routes, Protected Routes
- Forms in React - Controlled & Uncontrolled Components
- Context API for Global State Management
- Custom Hooks & Performance Optimization
- Styling - CSS Modules, Tailwind CSS, Styled Components

Project: Task Management App (Todo App with full CRUD)

Week 7-8: Node.js & Express.js - Backend

- Node.js - Introduction, Modules, File System, Event Loop
- NPM - Package Management, Scripts, Versioning
- Express.js - Routing, Middleware, Request/Response
- REST API Design - GET, POST, PUT, DELETE, PATCH
- Error Handling & Validation (express-validator, Joi)
- File Upload with Multer
- Environment Variables, Configuration Management

Project: RESTful API for Blog Platform

Week 9-10: MongoDB & Database Integration

- MongoDB - Installation, CRUD Operations, MongoDB Compass
- Mongoose ODM - Schemas, Models, Validation
- Advanced Queries - Aggregation Pipeline, Indexing
- Data Relationships - Embedding vs Referencing (populate)
- Authentication - User Registration, Login, JWT Tokens
- Authorization - Role-based Access Control (RBAC)
- Password Hashing with bcrypt, Session Management

Project: Full Blog Platform with Auth (Frontend + Backend)

Week 11: Advanced MERN Concepts

- Redux Toolkit for State Management
- Payment Gateway Integration (Razorpay)
- Image Upload to Cloudinary / AWS S3
- Email Service Integration (Nodemailer)
- Real-time Features with Socket.io
- Caching with Redis (Introduction)
- API Rate Limiting & Security Best Practices

Project: E-Commerce Store (Product listing, Cart, Checkout, Payment)

Week 12: Deployment & Career Preparation

- Git & GitHub - Branching, Merging, Pull Requests
- Frontend Deployment - Vercel, Netlify
- Backend Deployment - Render, Railway, AWS EC2
- MongoDB Atlas - Cloud Database Setup
- CI/CD Basics, Environment Variables in Production
- Domain Setup, SSL Certificates, DNS Configuration
- Resume Building, Portfolio Tips, Interview Preparation

Final Project: Real-time Chat Application (Socket.io + MERN)

Capstone Projects

1. Personal Portfolio Website

Tech Stack: HTML, CSS, JavaScript

A responsive portfolio showcasing your projects, skills, and contact info. Deployed on GitHub Pages.

2. Interactive Quiz Application

Tech Stack: JavaScript, DOM Manipulation

A dynamic quiz app with timer, score tracking, leaderboard, and multiple categories.

3. Task Management App

Tech Stack: React.js, Context API, LocalStorage

Full CRUD Todo app with filters, search, drag-and-drop, and theme toggle.

4. Full Stack Blog Platform

Tech Stack: MongoDB, Express.js, React.js, Node.js

Complete blog with user auth, CRUD posts, comments, image upload, and admin dashboard.

5. E-Commerce Store

Tech Stack: MERN Stack + Razorpay + Cloudinary

Product listing, cart, wishlist, checkout, Razorpay payment, order tracking, admin panel.

6. Real-time Chat Application (Final Project)

Tech Stack: MERN Stack + Socket.io

Group & private chat, typing indicators, online status, message history, file sharing.

Tools & Technologies Covered

Category	Technologies
Frontend	HTML5, CSS3, JavaScript, React.js, Redux, Tailwind CSS
Backend	Node.js, Express.js, REST APIs
Database	MongoDB, Mongoose, MongoDB Atlas, Redis (Intro)
Authentication	JWT, bcrypt, OAuth 2.0, Passport.js
DevOps & Deployment	Git, GitHub, Vercel, Render, AWS EC2, CI/CD
Tools	VS Code, Postman, MongoDB Compass, Chrome DevTools
Payment	Razorpay Integration
Real-time	Socket.io, WebSockets

Prerequisites

- ✓ Basic computer knowledge and familiarity with using a web browser
- ✓ A laptop/desktop with minimum 4GB RAM (8GB recommended)
- ✓ Stable internet connection for online sessions
- ✓ No prior programming experience required - we start from zero!
- ✓ Enthusiasm to learn and practice daily

Who Should Join?

- College students (BCA, MCA, B.Tech, BCS) looking for practical skills
- Freshers who want to become Full Stack Developers
- Working professionals switching career to Web Development
- Freelancers who want to build web applications for clients
- Entrepreneurs who want to build their own SaaS products
- Anyone passionate about learning modern web development

What You Get

Live Classes	12 weeks of instructor-led live sessions
Recorded Sessions	Access to all class recordings for revision
5+ Projects	Real-world projects for your portfolio
Certificate	Course completion certificate
Doubt Support	Daily doubt clearing sessions
Community	Access to student community & alumni network
Resume Building	Professional resume & LinkedIn profile guidance
Interview Prep	Mock interviews & common questions practice
Lifetime Access	Lifetime access to course materials & updates

Contact & Enrollment

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Enroll Now	Visit the website or call us to book your seat!

** Syllabus is subject to minor updates based on industry trends and student feedback.*