



# MERN Course

Duration: **JOB-READY PROGRAM - 6 Months**

Level : Job Ready

Best For : College students, freshers

A complete program to become a **full-stack MERN developer**, capable of building end-to-end web applications using MongoDB, Express.js, React.js, and Node.js.

Highly suitable for software development roles in **IT companies, startups, product-based firms, and freelancing projects**.

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## ★ Month 1 – Web Foundations & JavaScript Mastery

### Explanation:

Students build strong programming fundamentals. This month focuses on **how the web works**, core **JavaScript**, and problem-solving skills required for full-stack development.

### Topics Covered:

#### 1. Web Fundamentals

- How the internet works (DNS, HTTP/HTTPS)
- Client vs Server architecture
- Frontend vs Backend vs Database
- Introduction to REST APIs

#### 2. HTML5 (Structure of Web Pages)

- Semantic HTML
- Forms & validations
- Accessibility basics
- SEO-friendly HTML structure

#### 3. CSS3 (Styling & Layouts)

- Box model, flexbox, grid
- Responsive design (mobile-first)
- Media queries
- Basic animations & transitions

#### 4. JavaScript Core

- Variables, data types, operators
- Conditions & loops
- Functions & scope

- Arrays & objects
  - DOM manipulation
  - 5. **Practical Work – Month 1**
    - Build 3–4 static responsive pages
    - JavaScript mini-projects (calculator, to-do list)
    - DOM-based interactive UI
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## ★ **Month 2 – Advanced JavaScript & Backend Fundamentals**

### **Explanation:**

Students move from basic JS to **advanced concepts** and start learning **backend logic** using Node.js.

### **Topics Covered:**

1. **Advanced JavaScript**
  - ES6+ features
  - Arrow functions
  - Destructuring
  - Spread/rest operators
  - Async & defer
2. **Asynchronous JavaScript**
  - Callbacks
  - Promises
  - Async / Await
  - Event loop concept
3. **Node.js Basics**
  - What is Node.js?
  - NPM & package.json
  - Creating basic servers
  - File system module
4. **Express.js Introduction**
  - Express setup
  - Routing
  - Middleware concept
  - Request & response lifecycle
5. **Practical Work – Month 2**
  - Create basic REST APIs

- Build a simple backend for user data
  - Test APIs using Postman
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## ★ Month 3 – MongoDB & Full Backend Development

### Explanation:

Students learn database design, data handling, authentication and build production-ready backend APIs.

### Topics Covered:

#### 1. MongoDB Fundamentals

- NoSQL vs SQL
- Collections & documents
- CRUD operations
- Data modeling best practices

#### 2. Mongoose (ODM)

- Schemas & models
- Validation
- Relationships
- Pagination & filtering

#### 3. Authentication & Authorization

- JWT authentication
- Password hashing (bcrypt)
- Role-based access control

#### 4. Backend Best Practices

- Error handling
- Environment variables
- API security basics
- Clean code structure

#### 5. Practical Work – Month 3

- **Build complete backend for:**
  - User authentication
  - CRUD operations
  - Protected routes
- **Mini backend project (Blog / Product API)**

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## ★ Month 4 – React.js Frontend Development

### Explanation:

This month focuses on modern frontend development using React and building scalable UI components.

### Topics Covered:

#### 1. React Fundamentals

- SPA concepts
- JSX
- Components & props
- State management
- Conditional rendering

#### 2. React Hooks

- useState
- useEffect
- useContext
- Custom hooks

#### 3. Routing & Forms

- React Router
- Dynamic routes
- Controlled forms
- Form validation

#### 4. API Integration

- Fetch & Axios
- Connecting frontend with backend APIs
- Loading & error states

#### 5. Practical Work – Month 4

- Build React UI for backend APIs
  - Authentication pages (Login/Register)
  - Dashboard UI
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## ★ Month 5 – Full MERN Project & Advanced Concepts

### Explanation:

Students combine **frontend + backend + database** to build complete MERN applications.

### Topics Covered:

1. **Full-Stack Integration**
  - Connecting React with Node & MongoDB
  - Token-based authentication flow
  - Protected routes (frontend & backend)
2. **Advanced React**
  - State management patterns
  - Context API
  - Performance optimisation basics
3. **Project Architecture**
  - Folder structure
  - Reusable components
  - API layer abstraction
4. **Deployment Basics**
  - Environment setup
  - Build process
  - Hosting overview (AWS / Vercel / Render – concept)
5. **Practical Work – Month 5**
  - Build **1 major MERN project**:
    - Admin panel
    - Authentication
    - CRUD operations
  - Example projects:
    - Job Portal
    - E-commerce Store
    - LMS Platform

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## ★ Month 6 – Industry Practices, Projects & Job Preparation

### Explanation:

This month prepares students for **real IT jobs**, interviews, freelancing, and professional development.

### Topics Covered:

#### 1. **Advanced Backend Concepts (Awareness Level)**

- MVC architecture
- API versioning
- Rate limiting
- Basic system design concepts

#### 2. **Version Control (Git & GitHub)**

- Git commands
- Branching
- Pull requests
- Collaboration workflow

#### 3. **Testing & Debugging**

- Debugging techniques
- API testing
- Common production bugs

#### 4. **Resume, Portfolio & Interview Prep**

- MERN developer resume
- GitHub profile optimisation
- Project explanation strategy
- Technical interview questions

#### 5. **Placement & Career Support**

- Mock interviews
- Coding assignments practice
- Applying to IT companies
- Freelancing guidance

#### 6. **Final Projects – Month 6**

- 1 Full-Scale MERN Project
- Portfolio with GitHub repos

- Live deployed application



## ★ Final Outcomes After 6 Months

Students will be able to:

- Build **full-stack MERN applications**
- Create **REST APIs**
- Work with **databases**
- Develop **modern React frontends**
- Deploy applications
- Crack **MERN developer interviews**
- Start **freelancing or junior developer roles**

## Job Roles After Course

- MERN Stack Developer
- Full-Stack Web Developer
- Backend Developer (Node.js)
- Frontend Developer (React)
- Junior Software Engineer

## Why Popular

- High demand in IT companies
- One language (JavaScript) from frontend to backend
- Perfect for full-stack jobs & freelancing

## Freshers' Salary Range

₹15,000 – ₹20,000/month

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