

Backend Development

Complete Course Syllabus

Node.js | Express.js | MongoDB | REST APIs

Duration: 8 Weeks | Level: Beginner to Advanced | Certificate: Yes

■ Course Overview

This focused Backend Development course takes you from zero to a confident server-side developer. You will master Node.js, Express.js, MongoDB, and REST API design — the most in-demand backend skills in the industry. The course covers authentication, database design, deployment, and real-world security best practices through hands-on projects.

Duration	Mode	Level	Certificate
8 Weeks	Online + Offline	Beginner to Advanced	Yes

■ Skills You Will Learn

Node.js & NPM	Express.js Framework	REST API Design
MongoDB & Mongoose	Authentication (JWT)	Authorization (RBAC)
Password Hashing	File Upload (Multer)	Email Service
Payment Integration	Socket.io (Real-time)	Redis (Caching)
Git & GitHub	Cloud Deployment	Security Best Practices

■ Week-by-Week Curriculum

Week 1: JavaScript for Backend (ES6+ Essentials)

- Arrow Functions, Destructuring, Spread/Rest
- Promises, Async/Await, Error Handling
- Modules (import/export), Classes & Prototypes
- Node.js-specific JS patterns & best practices

Week 2–3: Node.js & Express.js

- Node.js – Introduction, Core Modules (fs, path, http, events)
- NPM – Package Management, Scripts, Versioning
- Express.js – Routing, Middleware, Request/Response lifecycle
- REST API Design – GET, POST, PUT, DELETE, PATCH
- Error Handling & Input Validation (express-validator, Joi)
- File Upload with Multer
- Environment Variables & Configuration Management (dotenv)

■ **Project: RESTful API for Blog Platform**

Week 4–5: MongoDB & Database Integration

- MongoDB – Installation, CRUD Operations, MongoDB Compass
- Mongoose ODM – Schemas, Models, Validation, Virtuals
- Advanced Queries – Aggregation Pipeline, Indexing
- Data Relationships – Embedding vs Referencing (populate)
- Pagination, Sorting & Filtering patterns
- Transactions & Error rollback basics

Week 6: Authentication & Authorization

- User Registration, Login flows
- JWT Tokens – Access Tokens & Refresh Tokens
- Password Hashing with bcrypt
- Role-based Access Control (RBAC) & Middleware guards
- OAuth 2.0 & Passport.js (Google / GitHub login)
- Session Management & Cookie handling

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

Week 7: Advanced Backend Concepts

- Redux Toolkit (for state in SSR scenarios)
- Payment Gateway Integration (Razorpay)
- Image & File Upload to Cloudinary / AWS S3
- Email Service Integration (Nodemailer + SMTP)
- Real-time Features with Socket.io & WebSockets
- Caching with Redis (Introduction)
- API Rate Limiting, Helmet.js & Security Best Practices

■ **Project: E-Commerce Store (Cart, Checkout, Payment)**

Week 8: Deployment & DevOps Basics

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

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

■ Capstone Projects

Project	Tech Stack	Description
1. RESTful Blog API	Node.js, Express.js	Full REST API for a blog: CRUD posts, categories, tags, pagination, and validation.
2. Full Blog Platform with Auth	MongoDB, Express.js, Node.js + React	Complete blog with user authentication, CRUD posts, comments, image upload, and admin dashboard.
3. E-Commerce Backend	MERN Stack + Razorpay + Cloudinary	Product management, cart, wishlist, checkout, Razorpay payment, order tracking, admin panel.
4. Real-time Chat Application	MERN Stack + Socket.io	Group & private chat, typing indicators, online status, message history, and file sharing.

■ Tools & Technologies

Category	Technologies
Runtime	Node.js, NPM, Nodemon
Framework	Express.js, REST API design patterns
Database	MongoDB, Mongoose ODM, MongoDB Atlas, Redis (Intro)
Authentication	JWT, bcrypt, OAuth 2.0, Passport.js
File & Media	Multer, Cloudinary, AWS S3
Real-time	Socket.io, WebSockets
Payment	Razorpay Integration
DevOps	Git, GitHub, Render, Railway, AWS EC2, CI/CD

Dev Tools	VS Code, Postman, MongoDB Compass, Insomnia
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■ What You Get

■ Live Classes	8 weeks of instructor-led live sessions
■ Recorded Sessions	Lifetime access to all class recordings for revision
■ 4 Real Projects	Portfolio-ready backend projects with source code
■ 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 backend/system design questions

■ Contact & Enrollment

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Visit the website or call us to enroll!

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