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Course Overview

Course Details

Course Name: Express.js Deep Dive: Build & Secure Production APIs

Instructor: Maria Garcia

Created On: 16 June, 2025

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Price: 3000 INR

Duration: 2 weeks

Modules: 17

Language: English, Hindi

Level: Intermediate

Certifications: Yes

Course Description

This course is your definitive guide to mastering Express.js. We focus exclusively on the art of building robust backends, from simple web servers to complex, enterprise-level APIs. You'll learn why Express is the most popular choice for Node.js developers and gain the practical skills to build fast and secure applications.

We start with the fundamentals, exploring the core of Express: routing and the powerful middleware architecture. You'll learn how to handle requests, send responses, and structure your application for scalability. We then dive deep into building RESTful APIs, integrating with both NoSQL (MongoDB) and SQL (PostgreSQL) databases, and implementing rock-solid

user authentication and comprehensive security measures.

The curriculum also covers advanced topics including centralized error handling, efficient file uploads, real-time communication with WebSockets (Socket.IO), structured application design, best practices for API documentation, thorough testing, and robust deployment strategies for production-ready Express.js applications. By the end of this course, you will have the confidence and expertise to build professional-grade backend services with Express.js.

What You'll Learn:

- Setting up and managing Express.js projects.
- Mastering the Express middleware system and advanced routing techniques.
- Building and effectively documenting professional RESTful APIs.
- Integrating with both NoSQL (MongoDB with Mongoose) and SQL (PostgreSQL with Sequelize) databases.
- Implementing secure authentication and authorization using JWT (JSON Web Tokens).
- Applying comprehensive API security best practices (Helmet.js, CORS, Rate Limiting, Data Validation).
- Advanced error handling, validation, and logging.
- Handling file uploads with Multer.
- Structuring Express applications using patterns like MVC and services.
- Writing robust integration tests for API endpoints with Jest & Supertest.
- Integrating real-time features with Socket.IO.
- Setting up TypeScript for type-safe Express development.
- Deploying and managing production-ready Express applications.

Who Is This Course For?

This course is ideal for anyone with a basic understanding of Node.js who wants to specialize in backend development using its most powerful framework. It's perfect for front-end developers aiming to become full-stack, and for backend developers wanting to solidify their Express.js skills with modern best practices and production readiness.

Prerequisites:

- **Solid JavaScript Fundamentals:** A strong understanding of core JavaScript (including asynchronous JavaScript, Promises, and ES6+ features).

- **Basic Node.js Knowledge:** Familiarity with Node.js runtime, NPM, and executing Node.js scripts.
- **Basic Understanding of HTTP & REST:** Knowledge of HTTP methods, status codes, and RESTful principles.
- **Familiarity with Databases (SQL/NoSQL basics):** Conceptual understanding of how databases work.
- **A Computer/Laptop:** A working computer (Windows, macOS, or Linux) with Node.js and an internet connection.
- **A Willingness to Learn:** Enthusiasm for building robust backend systems.

Includes practical labs for each module, a full API project, and a certificate of completion.
Available in English and Hindi.

Course Curriculum Details

Module 1: Module 1: Getting Started with Express.js

5 Lessons

1. 1. What is Express.js? (Node.js vs. Express.js) 15min
2. 2. Setting up an Express Project with NPM 20min
3. 3. Your First Express Server: Handling Basic Requests and Sending Responses 25min
4. 4. Understanding `package.json` and Basic Dependencies 15min
5. 5. Recap & Practical Task: Create and Run Your First Express Server 30min

Module 2: Module 2: The Core of Express: Middleware

6 Lessons

1. 6. What is Middleware? The `req`, `res`, `next()` Cycle 30min

2. 7. Using Built-in Express Middleware (`express.json()`, `express.urlencoded()`, `express.static()`) **25min**

3. 8. Integrating Third-Party Middleware (e.g., Morgan for logging) **25min**

4. 9. Writing Your Own Custom Middleware **30min**

5. 10. Order of Middleware Execution and Common Gotchas **20min**

6. 11. Recap & Practical Task: Build Custom Logging Middleware **40min**

Module 3: Module 3: Routing In-Depth

6 Lessons

1. 12. Basic Routing and HTTP Methods (GET, POST, PUT, DELETE) **20min**

2. 13. Handling Route Parameters (`:id`) and Query Strings (`?key=value`) **25min**

3. 14. Organizing Routes with Express Router **30min**

4. 15. Route Chaining and Modular Routes **25min**

5. 16. Redirects and Rendering Views (Brief Overview of `res.render()`) **15min**

6. 17. Recap & Practical Task: Create a Multi-Route API Structure **45min**

Module 4: Module 4: Building RESTful APIs (CRUD Operations)

7 Lessons

1. 18. REST Principles and API Design Best Practices **25min**

2. 19. Implementing GET Endpoints (Read All & Read One) **35min**

3. 20. Implementing POST Endpoints (Create Resources) **30min**

4. 21. Implementing PUT/PATCH Endpoints (Update Resources) **30min**

5. 22. Implementing DELETE Endpoints (Remove Resources) **20min**

6. 23. Sending Proper JSON Responses and HTTP Status Codes **25min**

7. 24. Recap & Practical Task: Build a Simple CRUD API for a Resource **1hr**

Module 5: Module 5: Data Persistence with MongoDB & Mongoose

6 Lessons

1. 25. Introduction to MongoDB for NoSQL Data Storage **20min**

2. 26. Integrating Mongoose (ODM) with Express.js **25min**

3. 27. Building a Data Model and Schema with Mongoose **30min**

4. 28. Performing CRUD Operations on MongoDB with Mongoose **40min**

5. 29. Connecting Your API Routes to the Database **35min**

6. 30. Recap & Practical Task: Connect Your CRUD API to MongoDB **1hr 15min**

Module 6: Module 6: Data Persistence with SQL & Sequelize

6 Lessons

1. 31. Introduction to Relational Databases (PostgreSQL/MySQL Overview) **20min**

2. 32. Integrating Sequelize (ORM) with Express.js **30min**

3. 33. Defining Models and Migrations with Sequelize **35min**

4. 34. Performing CRUD Operations on SQL Database with Sequelize **35min**

5. 35. Querying a Relational Database from Express API **30min**

6. 36. Recap & Practical Task: Create a SQL-backed CRUD API **1hr 15min**

Module 7: Module 7: Authentication with JWT (JSON Web Tokens)

7 Lessons

1. 37. Understanding User Authentication vs. Authorization **20min**

2. 38. Hashing Passwords with `bcrypt.js` **25min**

3. 39. Introduction to JWT: Structure and Purpose **30min**

4. 40. Creating and Signing JSON Web Tokens **35min**

5. 41. Creating Middleware to Verify and Protect Routes with JWT **30min**

6. 42. Refresh Tokens (Conceptual Overview) **20min**

7. 43. Recap & Practical Task: Implement User Registration, Login, and JWT Protected Routes **1hr 30min**

Module 8: Module 8: API Security Best Practices

7 Lessons

1. 44. Using Helmet.js to Secure HTTP Headers **20min**

2. 45. Enabling CORS (Cross-Origin Resource Sharing) for API Access **25min**

3. 46. Implementing Rate Limiting to Prevent Abuse **25min**

4. 47. Data Validation and Sanitization (e.g., with Joi/Express-Validator) **30min**

5. 48. Preventing SQL Injection (with ORMs) and XSS (Output Encoding) **25min**

6. 49. Handling Sensitive Data (Environment Variables) **20min**

7. 50. Recap & Practical Task: Secure Your API with Helmet.js, CORS, and Rate Limiting **1hr**

Module 9: Module 9: Advanced Error Handling & Logging

5 Lessons

1. 51. Default Error Handling in Express and Custom Error Objects **20min**

2. 52. Creating a Centralized Error Handling Middleware **30min**

3. 53. Handling Async Errors Gracefully (Express Async Handler) **25min**

4. 54. Logging with Morgan and Winston/Pino **30min**

5. 55. Recap & Practical Task: Implement a Robust Global Error Handler and Basic Logging **1hr**

Module 10: Module 10: File Uploads & Cloud Storage

4 Lessons

1. 56. Handling `multipart/form-data` with Multer **35min**

2. 57. Validating and Processing Uploaded Files **25min**

3. 58. Storing Files Locally vs. Cloud Storage (e.g., AWS S3, Cloudinary - Conceptual) **30min**

4. 59. Recap & Practical Task: Implement an Image Upload API Endpoint **1hr**

Module 11: Module 11: Structuring Express Applications

5 Lessons

1. 60. Applying the MVC (Model-View-Controller) Pattern to Express APIs **30min**
2. 61. Separating Business Logic into Services/Managers **25min**
3. 62. Managing Configuration and Environment Variables (`dotenv`) **25min**
4. 63. Project Structure Best Practices (Modular vs. Feature-based) **20min**
5. 64. Recap & Practical Task: Refactor a Basic API into a Scalable Structure **1hr**

Module 12: Module 12: Testing Express APIs

6 Lessons

1. 65. Setting up a Test Environment with Jest & Supertest **25min**
2. 66. Writing Unit Tests for Controllers and Services **40min**
3. 67. Writing Integration Tests for API Endpoints **45min**
4. 68. Mocking Services and Database Interactions **30min**
5. 69. Test Driven Development (TDD) Approach (Conceptual) **20min**
6. 70. Recap & Practical Task: Implement Tests for a Blog API Endpoint **1hr 30min**

Module 13: Module 13: Real-time with Socket.IO

5 Lessons

1. 71. Introduction to Real-time Applications and WebSockets **25min**
2. 72. Integrating Socket.IO with an Express Server **35min**
3. 73. Emitting Events and Broadcasting Messages to Clients **30min**

4. 74. Handling Socket.IO Events (Connection, Disconnect, Custom Events) **25min**

5. 75. Recap & Practical Task: Build a Simple Chat Application (Backend) **1hr**

Module 14: Module 14: Integrating TypeScript

5 Lessons

1. 76. Why Use TypeScript with Express? **20min**

2. 77. Setting up a TypeScript-based Express Project **30min**

3. 78. Typing Middleware, Requests, and Responses **35min**

4. 79. Typing Database Models and ORM Interactions **30min**

5. 80. Recap & Practical Task: Convert a Small Express Project to TypeScript **1hr**

Module 15: Module 15: Documenting APIs

4 Lessons

1. 81. Importance of API Documentation **15min**

2. 82. Manual Documentation with Postman Collections **25min**

3. 83. Automating Documentation with Swagger/OpenAPI (Using `swagger-ui-express`) **35min**

4. 84. Recap & Practical Task: Document Your Blog API with Swagger **1hr**

Module 16: Module 16: Deployment & Production Readiness

7 Lessons

1. 85. Preparing for Production: Environment Variables and Security Checklist **20min**

2. 86. Optimizing Express Applications for Performance **25min**

3. 87. Using a Process Manager like PM2 (Clustering, Monitoring) **30min**

4. 88. Deploying to Cloud Platforms (Heroku, Render, AWS EC2 - Conceptual) **35min**

5. 89. Setting up Nginx as a Reverse Proxy **25min**

6. 90. Continuous Integration/Continuous Deployment (CI/CD) Overview **20min**

7. 91. Recap & Practical Task: Prepare Your API for Deployment and Run with PM2
1hr 15min

Module 17: Module 17: Final Project - Build a Blog API

5 Lessons

1. 92. Project Scoping, Data Modeling, and API Design (for Blog) **45min**

2. 93. Implementing All API Endpoints (CRUD, Authentication, Authorization, Comments)
2hr 30min

3. 94. Integrating Database and Error Handling **1hr**

4. 95. Final Testing, Documentation, and Optimization **1hr 15min**

5. 96. Recap & Final Project Submission **1hr 30min**

This curriculum is subject to minor adjustments to ensure the most up-to-date and effective learning experience.