

Week 1-3: Backend Foundations (Node.js, Express.js & MongoDB)

Week 1: Node.js & Express.js Core

Understanding Node.js runtime

Event Loop & Asynchronous Programming

Creating an HTTP server with Node.js (http module)

Introduction to Express.js

Middleware & Routing in Express

Handling Requests & Responses

Week 2: RESTful APIs & MongoDB

RESTful API Design Principles

Connecting Express to MongoDB

CRUD Operations with Mongoose

Data Validation & Schemas

Error Handling & Logging in Express

Week 3: Authentication & Authorization

User Authentication with JWT

Password Hashing with bcrypt

Role-Based Access Control (RBAC)

Session Management & Cookies

Security Best Practices (Helmet, CORS, Rate Limiting)

Week 4-6: Advanced Backend Development

Week 4: File Management & API Enhancements

File Uploads with Multer

Sending Emails with Nodemailer

Implementing Search & Filtering

API Versioning & Documentation (Swagger/Postman)

Week 5: Caching & Performance Optimization

Caching with Redis

API Pagination & Query Optimization

Load Balancing & Rate Limiting

Profiling & Monitoring APIs

Week 6: Real-Time Features & Testing

WebSockets for Real-Time Communication

Implementing Push Notifications

Unit & Integration Testing with Jest & Supertest

Debugging & Error Handling Strategies

Week 7-8: Deployment & Scaling

Week 7: Production-Ready API Development

Environment Variables & Configuration

API Logging with Winston & Morgan

Queue Processing with BullMQ

Week 8: Deployment & CI/CD

Dockerizing an Express.js App

CI/CD Pipelines with GitHub Actions

Deploying to Heroku, Digital Ocean, or AWS

Week 9-10: Capstone Project

Week 9: Full-Stack Integration & Project Development

Integrating Express.js Backend with a React/Next.js Frontend

Serverless Functions with AWS Lambda/Vercel

Start Capstone Project: Build a real-world API

Week 10: Project Deployment & Documentation

Finalize & Optimize the API

Write API documentation (Swagger/Postman)

Deploy & Present the project

Final Deliverables

Fully deployed API project

GitHub repository with code & documentation

API documentation (Swagger/Postman)

Performance optimization & testing reports