

# Node.js Complete Course Outline (30 Lectures × 45 min)

## Introduction & Setup (Lectures 1-3)

- Lecture 1: Node.js Introduction, Features, Environment Setup
- Lecture 2: Node Architecture, Event Loop, Asynchronous Programming
- Lecture 3: Node.js Core Modules Overview (FS, Path, Events, HTTP)

## Module System & Package Management (Lectures 4-6)

- Lecture 4: Understanding Modules and require()
- Lecture 5: Creating Custom Modules and Exporting
- Lecture 6: Node Package Manager (NPM), Managing Dependencies, Semantic Versioning

## File System & Streams (Lectures 7-9)

- Lecture 7: File Handling (Read/Write, Streams)
- Lecture 8: Working with Buffers and Streams, Pipe and Chaining
- Lecture 9: EventEmitter and Custom Events

## Web Servers & Express.js (Lectures 10-14)

- Lecture 10: Creating Basic HTTP Server
- Lecture 11: Introduction to Express.js Framework
- Lecture 12: Routing, Middleware, Static Files in Express.js
- Lecture 13: Handling Forms and Input Validation
- Lecture 14: Template Engines (EJS, Pug)

## Database Integration (Lectures 15-17)

- Lecture 15: Connecting to MongoDB using Mongoose, CRUD Operations
- Lecture 16: MySQL Database Integration
- Lecture 17: Schema Design and Validation

## Authentication & Security (Lectures 18-20)

- Lecture 18: User Authentication with JWT and Passport.js
- Lecture 19: Security Best Practices – CORS, Helmet, Rate Limiting
- Lecture 20: Error Handling and Logging

## APIs & Real-time Applications (Lectures 21-24)

- Lecture 21: Building RESTful APIs with Express.js
- Lecture 22: Introduction to GraphQL APIs
- Lecture 23: WebSockets and Real-time Communication with Socket.io
- Lecture 24: API Testing with Postman and Automated Testing

## Testing & Performance (Lectures 25-27)

- Lecture 25: Unit Testing with Mocha & Chai
- Lecture 26: Integration Testing
- Lecture 27: Performance Optimization and Debugging Tools

## Deployment & Advanced Topics (Lectures 28-30)

- Lecture 28: Environment Variables and Config Management
- Lecture 29: Deploying Node.js Apps to Cloud Platforms (Heroku, AWS)
- Lecture 30: Introduction to Microservices and Serverless Architecture with Node.js