

NODEJS SYLLABUS

Module 1: Introduction to Node.js

- What is Node.js and how it works
- Features of Node.js
- Event-driven architecture
- Installing Node.js and npm
- Running first Node.js program

Module 2: Node.js Fundamentals

- Modules and require()
- Global objects
- File system module (fs)
- Path module
- OS module

Module 3: NPM (Node Package Manager)

- Installing packages
- package.json
- Managing dependencies
- Global vs local packages

Module 4: Asynchronous Programming

- Callbacks
- Promises
- Async/Await
- Event loop concept

Module 5: HTTP Module

- Creating HTTP server
- Handling requests and responses
- Routing basics
- Serving static files

Module 6: Express.js Framework

- Introduction to Express.js
- Creating server with Express
- Routing in Express
- Middleware basics
- Handling requests (GET, POST)

Module 7: Advanced Express

- Route parameters
- Query parameters
- Error handling middleware
- RESTful routing

Module 8: Working with Databases

- Introduction to databases
- MongoDB basics
- Connecting Node.js with MongoDB
- CRUD operations
- Mongoose ORM

Module 9: REST API Development

- Designing REST APIs
- CRUD API development
- JSON handling

- API testing (Postman)

Module 10: Authentication & Security

- User authentication
- JWT (JSON Web Token)
- Password hashing (bcrypt)
- Protecting routes
- Security best practices

Module 11: File Uploading

- Handling file uploads
- Using multer
- Storing files
- File validation

Module 12: Real-Time Applications

- Introduction to WebSockets
- Socket.io basics
- Building chat applications

Module 13: Environment & Configuration

- Environment variables
- dotenv package
- Config management

Module 14: Error Handling & Debugging

- Handling errors
- Debugging techniques
- Logging

Module 15: Testing Basics

- Unit testing
- Testing tools (Jest/Mocha)
- API testing

Module 16: Performance Optimization

- Caching
- Compression
- Rate limiting
- Scaling applications

Module 17: Deployment

- Preparing app for production
- Hosting Node.js app
- Using PM2
- Deployment on cloud (Heroku/Vercel)

Module 18: Real-World Projects

- REST API project
- Authentication system
- Blog backend
- E-commerce backend