

Node.js Training Module

Module 1: Introduction to Node.js

Topics:

- What is Node.js?
- Node.js vs JavaScript in the browser
- Event-driven architecture
- Node.js use-cases

Explanation: Node.js is a runtime built on Chrome's V8 JavaScript engine for server-side execution of JS code. It's event-driven, non-blocking and ideal for scalable apps.

Resources:

- <https://nodejs.org/en/docs/guides/getting-started-guide>
- <https://www.youtube.com/watch?v=fBNz5xF-Kx4>

Module 2: Setting Up Node.js

Topics:

- Installing Node.js and npm
- Using the Node REPL
- Writing your first Node.js script

Resources:

- <https://nodejs.org/en/download/>
- <https://nodejs.org/en/learn/getting-started/the-nodejs-runtime-environment>

Module 3: Node.js Fundamentals

Topics:

- Global objects (___dirname, ___filename, process, etc.)
- Modules and require()
- Exports and CommonJS

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Resources:

- <https://nodejs.org/api/modules.html>
- <https://nodejs.org/api/globals.html>

Module 4: File System Module (fs)

Topics:

- Reading and writing files
- Working with directories
- Streams and buffers

Explanation: Learn how to interact with the file system asynchronously and synchronously.

Resources:

- <https://nodejs.org/api/fs.html>
- <https://www.youtube.com/watch?v=U5R1xgKCN1Q>

Module 5: Event Loop and Events

Topics:

- Understanding Event Loop
- EventEmitter class
- Custom events

Resources:

- <https://nodejs.org/api/events.html>
- <https://www.youtube.com/watch?v=8aGhZQkoFbQ>

Module 6: Asynchronous Programming

Topics:

- Callbacks
- Promises

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- Async/Await

Explanation: Learn how to manage asynchronous operations effectively, avoiding callback hell.

Resources:

- https://developer.mozilla.org/en-US/docs/Web/JavaScript/Guide/Using_promises
- <https://developer.mozilla.org/en-US/docs/Learn/JavaScript/Asynchronous/Promises>

Module 7: Working with npm

Topics:

- Installing packages
- Semantic versioning
- Creating package.json
- Local vs Global installation

Resources:

- <https://docs.npmjs.com/>
- <https://docs.npmjs.com/cli/v9/commands>

Module 8: Building a Web Server

Topics:

- Creating HTTP server
- Handling requests and responses
- Routing manually

Resources:

- <https://nodejs.org/api/http.html>

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<https://www.digitalocean.com/community/tutorials/how-to-create-a-web-server-in-node-js-with-the-http-module>

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Module 9: Express.js Basics

Topics:

- Setting up Express
- Routing
- Middleware
- Serving static files

Resources:

- <https://expressjs.com/>
- <https://www.youtube.com/watch?v=L72fhGm1tfE>

Module 10: REST APIs with Express

Topics:

- CRUD operations
- Route parameters and query strings
- Postman testing

Resources:

- <https://www.digitalocean.com/community/tutorials/build-a-restful-api-using-node-js-and-express-4>
- <https://www.postman.com/>

Module 11: Working with MongoDB

Topics:

- Connecting Node.js with MongoDB using Mongoose
- Schemas and models
- Basic CRUD operations

Resources:

- <https://www.mongodb.com/cloud/atlas>
- <https://mongoosejs.com/docs/index.html>

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Module 12: Error Handling & Debugging

Topics:

- Try/catch
- Error-first callbacks
- Custom error handling middleware

Resources:

- <https://www.digitalocean.com/community/tutorials/how-to-use-the-node-js-debugger>

Module 13: Authentication & Authorization

Topics:

- JWT tokens
- Passport.js basics
- Role-based access

Resources:

- <https://jwt.io/introduction>
- <https://www.freecodecamp.org/news/how-to-authenticate-users-in-node-using-jwt-json-web-tokens/>

Bonus Module 14: Advanced Topics

Topics:

- Clustering
- Worker Threads
- Caching
- Rate limiting

Resources:

- <https://nodejs.org/en/docs/guides/nodejs-docker-webapp/>
- <https://www.section.io/engineering-education/caching-with-nodejs-and-redis/>

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Bonus Module 15: Testing & Deployment

Topics:

- Unit testing with Jest/Mocha
- API testing with Supertest
- Environment variables (dotenv)
- Deploying on platforms like Render, Vercel, or Heroku

Resources:

- <https://mochajs.org/>
- <https://render.com/docs/deploy-node-express-app>