

Node JS

Prerequisites: Knowledge of Java Script ES6 programming

Day 1: Introduction to Node.js and Basic Concepts

- What is Node.js?
- History and evolution of Node.js
- Understanding the Node.js runtime and event-driven architecture
- Installing Node.js and npm
- Using the Node.js REPL
- Understanding the project structure and package.json
- Understanding modules in Node.js
- Using built-in modules (fs, path, os)
- Creating and exporting custom modules
- Reading from and writing to files
- Working with directories
- Handling file system errors

Lab 1: Setting Up and Basic Modules

- Setting up a new Node.js project
- Creating and using custom modules
- Performing file operations using the fs module

Day 2: Asynchronous Programming and HTTP Module

- Callbacks in Node.js
- Introduction to Promises
- Using async/await for asynchronous code
- Understanding EventEmitter class
- Creating and handling custom events
- Working with readable and writable streams
- Using the http module
- Creating an HTTP server
- Handling basic routing and responses
- Parsing request data
- Handling POST requests
- Working with query strings and URL parameters

Lab 2: Asynchronous Code and HTTP Server

- Writing asynchronous functions with callbacks, Promises, and async/await
- Creating and using custom events
- Building a simple HTTP server and handling requests

Day 3: Express.js and Middleware

- Installing and setting up Express
- Basic routing with Express
- Serving static files
- Understanding middleware functions
- Creating custom middleware
- Using built-in middleware
- Handling route parameters
- Working with query strings
- Nested routes and routers
- Error handling middleware
- Debugging Express applications
- Using logging libraries (e.g., morgan)

Lab 3: Building an Express Application

- Setting up an Express project
- Implementing routes and middleware
- Handling errors and debugging issues

Day 4: Database Integration and Authentication

- Introduction to MongoDB
- Setting up and connecting to MongoDB using Mongoose
- Defining schemas and models
- Creating documents
- Reading documents with queries
- Updating and deleting documents
- Introduction to JSON Web Tokens (JWT)
- Setting up authentication routes
- Protecting routes with middleware
- Understanding sessions and cookies
- Using session middleware
- Implementing login and logout functionality

Lab 4: Database Operations and Authentication

- Setting up MongoDB and Mongoose
- Performing CRUD operations
- Implementing JWT-based authentication and session management

Day 5: Real-Time Applications and Deployment

- Introduction to WebSockets
- Setting up Socket.io with Node.js
- Creating a real-time chat application
- Designing RESTful routes

- Implementing CRUD operations for API endpoints
- Testing APIs with Postman
- Writing unit tests with Mocha and Chai
- Using Supertest for API testing
- Debugging techniques and tools
- Preparing a Node.js application for deployment
- Deploying to cloud platforms (Heroku, AWS)
- Best practices for Node.js development

Lab 5: Final Project and Deployment

- Building a real-time chat application
- Creating and testing a RESTful API
- Deploying the final project