

FULL STACK WEB DEVELOPMENT USING MERN – SYLLABUS – 120 HRS

Module 1: Web & JavaScript Fundamentals (25 hours)

1.1 HTML & CSS Basics (5 hours)

- HTML5 elements, forms, semantic structure
- CSS styling, Flexbox, Grid layout, responsive design

1.2 JavaScript Core Concepts (15 hours)

- Variables, data types, operators
- Functions, conditionals, loops
- Arrays, objects, JSON
- DOM manipulation
- Events, event listeners
- ES6+ features: let/const, arrow functions, template literals, destructuring
- Introduction to asynchronous JS: Callbacks, Promises, async/await

1.3 Git & GitHub (5 hours)

- Version control basics
- Creating and managing repositories
- Branches, commits, and collaboration

Module 2: React.js – Frontend Development (25 hours)

2.1 React Basics

- Introduction to React, JSX
- Components, Props, and State
- Handling user input and forms
- Conditional rendering and list rendering

2.2 Intermediate React

- React Hooks: useState, useEffect, useContext
- React Router for navigation
- API integration using Axios / Fetch

2.3 UI Frameworks & Styling

- Tailwind CSS / Bootstrap integration
- Component design and responsive layout

Module 3: Backend with Node.js & Express.js (25 hours)

3.1 Node.js Basics

- Intro to Node.js & npm
- File system, modules, events
- Environment variables and project structuring

3.2 Express.js Framework

- Creating RESTful APIs
- Routing and middleware
- CRUD operations
- Error handling and input validation

3.3 MongoDB with Mongoose

- Database connection (local/cloud)
- Schema definition and data models
- Performing CRUD with Mongoose

Module 4: Full Stack Integration & Deployment (20 hours)

4.1 Frontend-Backend Integration

- Connecting React frontend to Express backend
- Form submission and dynamic content rendering
- Using JWT for authentication

4.2 Authentication & Authorization

- User login/registration
- Password hashing with bcrypt
- Protected routes and token storage

4.3 Deployment

- Hosting backend (Render / Railway)
- Hosting frontend (Netlify / Vercel)
- Environment setup and deployment best practices

Module 5: Capstone Project & Portfolio (25 hours)

5.1 Capstone Project Development (15 hours)

- Full Stack MERN Project
- Examples: Blog, Chat App, E-Commerce, Todo Manager
- Includes planning, development, testing, and deployment

5.2 Portfolio & GitHub Readiness (5 hours)

- Uploading and documenting projects
- Writing clear README files
- Showcasing live demos

5.3 UI/UX Enhancement (5 hours)

- Accessibility practices
- Polishing UI design
- Mobile responsiveness

Key Job Roles in MERN Stack Development:

1. Full Stack Developer
2. JavaScript Developer
3. Frontend Developer (React.js)
4. Backend Developer (Node.js/Express.js)
5. Web Developer
6. MongoDB Developer
7. MERN Stack Intern
8. UI Developer
9. API Developer
10. Junior Software Engineer

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