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Professional Full Stack Web Developer (MERN Stack)

Module 1: The Foundation (Weeks 1-3)

Goal: Build static, responsive websites.

- **Web Fundamentals:** How the internet works (HTTP/HTTPS, DNS, Browsers).
- **HTML5 Mastery:** Semantic HTML, Forms, Validations, SEO basics.
- **CSS3 & Modern Styling:**
 - Flexbox & Grid systems (Crucial for modern layout).
 - Responsive Design (Media Queries) for Mobile-First development.
 - **Frameworks: Tailwind CSS** (Trending) and Bootstrap 5.
- **Project 1:** Build a Personal Portfolio Website.

Module 2: JavaScript Logic & Algorithms (Weeks 4-6)

Goal: Make websites interactive and learn programming logic.

- **Core JS:** Variables, Data Types, Loops, Functions.
- **DOM Manipulation:** Selecting elements, Event Listeners (Click, Hover, Submit).
- **Modern ES6+ Features:** Arrow Functions, Destructuring, Spread Operator, Template Literals.
- **Asynchronous JS:** Promises, Async/Await, Fetch API (Consuming JSON data).
- **Project 2:** Weather App (Fetching live weather data from an open API).

Module 3: Frontend Mastery with React.js (Weeks 7-10)

Goal: Build Single Page Applications (SPAs) like Facebook or Instagram.

- **React Basics:** JSX, Components, Props.
- **Hooks:** `useState`, `useEffect` (The modern way to write React).
- **Routing:** React Router v6 (Navigating without page reloads).
- **State Management:** Context API (Managing data across the app).
- **Project 3:** E-commerce Product Page with Cart Functionality.

Module 4: Backend Engineering (Weeks 11-13)

Goal: Create your own server and API.

- **Node.js Environment:** Installing Node, NPM (Node Package Manager).
- **Express.js Framework:** Setting up a server, Routing (GET, POST, PUT, DELETE).
- **RESTful APIs:** Building API endpoints to send data to the frontend.
- **Middleware:** Handling errors and authentication checks.
- **Tools:** Using **Postman** to test APIs.

Module 5: Database Management (Weeks 14-15)

Goal: Store and manage user data permanently.

- **MongoDB (NoSQL):** Cloud setup with MongoDB Atlas (Free tier).
- **Mongoose ODM:** Creating Schemas and Models.
- **CRUD Operations:** Create, Read, Update, Delete data from the database.
- **Project 4:** "Task Manager API" (Backend only).

Module 6: Security & Authentication (Week 16)

- **Authentication:** User Registration & Login logic.
- **Security:** Hashing passwords (Bcrypt.js) and JWT (JSON Web Tokens) for secure sessions.

Module 7: Full Stack Integration & Deployment (Weeks 17-18)

Goal: Connect Frontend + Backend and go live.

- **Connecting the Dots:** Fetching data from your own backend into your React Frontend.
- **Deployment:**
 - Frontend: Vercel or Netlify.
 - Backend: Render or Railway.
 - Database: MongoDB Atlas.
- **DevOps Basics:** Git & GitHub (Commit, Push, Pull requests).

Module 8: The "New Tech" Edge (Week 19)

Differentiation: This is what most other institutes don't teach yet.

- **AI for Developers:** How to use ChatGPT and GitHub Copilot to debug code and write boilerplate faster.
- **Next.js Intro:** A brief 2-hour introduction to Next.js (The future of React) to show students the path forward.

Final Capstone Project (Weeks 20-24)

Students must build one of the following to graduate:

1. **Full E-commerce Platform:** (User login, Product catalog, Cart, Checkout simulation).
2. **Social Media Dashboard:** (Post updates, Like posts, User profiles).
3. **School Management Portal:** (Student login, View marks, Download reports).

Certification Levels

Level 3: Certified Web Designer (The Foundation)

Focus: Creating beautiful, responsive static websites. No heavy programming logic yet.

Output: Student can build a personal portfolio or a simple business website.

- 1: Web Essentials: How the web works, Semantic HTML5, SEO tags.
- 2: CSS Mastery: Flexbox, Grid, Colors, Fonts, Mobile Responsiveness (Media Queries).
- 3: Frameworks: Bootstrap 5 & Introduction to Tailwind CSS (Speeding up design).
- 4: Deployment & Project: Buying a domain/hosting, using cPanel, uploading files via FTP.
 - *Final Project: 5-Page Business Website for a fictional company.*

Level 4: Professional Frontend Developer (Interactive UI)

Focus: Making websites "think" and interact. Learning React.js.

Output: Student can build interactive apps (Weather app, Todo list, Dashboard).

- 1: JavaScript Core: Variables, Loops, Functions, DOM Manipulation (Click events).
- 2: Advanced JS: ES6+, Arrow Functions, Fetch API (Getting data from servers), JSON.
- 3: React Basics: Components, Props, State, Virtual DOM.
- 4: React Hooks: useState, useEffect, Managing forms.
- 5: Routing & State: React Router (Multi-page apps), Context API.
- 6: Project Work: Connecting to a public API (e.g., Movie Database).
 - *Final Project: Movie Search App or Weather Dashboard.*

Level 5: Certified Full Stack Engineer (Backend & API)

Focus: Server-side engineering, Databases, and Security.

Output: Student can build a fully functional system with login/signup.

- 1: Node.js & Express: Setting up a server, REST API structure (GET, POST).
- 2: MongoDB (NoSQL): Database design, Collections, CRUD operations (Create, Read, Update, Delete).
- 3: Authentication: User Login, Sign up, Password Hashing (Bcrypt), JWT Tokens.
- 4: Full Integration: Connecting React Frontend to Node Backend.
- 5: Deployment: Deploying Backend to Render/Railway and Frontend to Vercel/Netlify.
- 6: Capstone: Final troubleshooting and professional code review.
 - *Final Project: E-commerce Cart System with Admin Panel.*