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Course Title

JavaScript Full Stack Development Bootcamp (MERN Stack)

Course ID

WEB-ENG-301 (MERN)

Course Level

Intermediate to Advanced (Job-Ready Bootcamp)

Duration

300 Hours (Full-Time Bootcamp)

Includes instructor-led training, labs, guided assignments, quizzes, mock interviews, capstone project, portfolio building, and certification preparation.

Delivery Mode

Hybrid / Onsite + Online LMS Support

Course Description

This bootcamp prepares trainees for full stack development roles using JavaScript technologies. Learners will gain practical skills in frontend development with React.js, backend development with Node.js and Express.js, and database management using MongoDB. The course emphasizes real-world application development, REST API building, authentication, deployment, and job-ready development practices.

Course Objectives

By the end of this bootcamp, learners will be able to build complete MERN stack web applications. They will develop responsive user interfaces using HTML5, CSS3, Tailwind CSS, and React.js, and create secure REST APIs using Node.js and Express. Learners will work with MongoDB databases, implement authentication and role-based authorization using JWT, and deploy applications using Vercel, Netlify, Render, and AWS basics. The course also supports interview preparation through projects, GitHub portfolio development, and mock interviews.

Intended Audience

This course is designed for software engineering students, IT graduates, junior developers, freelancers, and professionals aiming to become job-ready full stack MERN developers.

Prerequisites

Basic computer skills are required. Familiarity with programming concepts is helpful but not mandatory. Learners should have strong logical thinking and willingness to practice consistently. A laptop with minimum i5 processor and 8GB RAM (16GB recommended) along with stable internet is required.

Tools & Platforms

Learners will work with Visual Studio Code, Node.js, Git and GitHub, Postman, MongoDB Compass and MongoDB Atlas, React Developer Tools, and Chrome DevTools. Deployment platforms include Vercel, Netlify, Render, and AWS (basic usage). Course resources, assignments, and quizzes will be delivered through the LMS portal.

Course Outline (Modules & Topics)

Module 1: Web Development Foundations

Overview of web development ecosystem, client-server architecture, browser workflow, hosting concepts, DNS, HTTP/HTTPS, and application lifecycle. Lab includes development environment setup and installation of required tools.

Module 2: HTML5 and Modern Web Structure

HTML5 semantic elements, forms, accessibility, media integration, SEO-friendly structure, and best practices. Lab includes building a multi-page website using modern semantic HTML.

Module 3: CSS3 and Responsive Web Design

CSS selectors, specificity, box model, positioning, Flexbox, Grid, media queries, animations, and transitions. Lab includes building a responsive landing page layout.

Module 4: Tailwind CSS and UI Systems

Tailwind utility-first design, layout building, responsive breakpoints, dark mode, and professional dashboard styling. Lab includes developing a responsive dashboard UI.

Module 5: JavaScript Fundamentals

Variables, data types, operators, functions, loops, conditions, arrays, objects, DOM manipulation, events, and browser storage. Lab includes building an interactive to-do app using Vanilla JavaScript.

Module 6: Advanced JavaScript (ES6+)

Destructuring, spread/rest, closures, scope, promises, async/await, Fetch API, error handling, and modular programming. Lab includes building an API-based weather application.

Module 7: React.js Fundamentals

React ecosystem, JSX, components, props, state, hooks, lifecycle concepts, conditional rendering, lists, forms, and controlled components. Lab includes building a dynamic product listing UI.

Module 8: React Router and State Management

SPA routing, React Router setup, nested and dynamic routes, route guards, Context API, and optional Redux Toolkit introduction. Lab includes developing a multi-page React dashboard application.

Module 9: API Integration in React

REST API consumption, axios vs fetch, error handling, loading states, pagination, filtering, and authentication token storage practices. Lab includes connecting React frontend with external APIs.

Module 10: Node.js Fundamentals

Backend development basics, Node runtime, NPM, file system module, event loop concepts, and server creation. Lab includes building a Node.js server with basic routing.

Module 11: Express.js and Backend Architecture

Express setup, middleware, routing best practices, MVC architecture, error handling middleware, and API versioning. Lab includes building REST APIs for a blog system.

Module 12: MongoDB and Database Development

NoSQL concepts, MongoDB CRUD operations, MongoDB Atlas setup, Mongoose, schema design, validation, and database relationships. Lab includes building database models for an ecommerce application.

Module 13: Authentication & Authorization

JWT authentication, bcrypt hashing, role-based access control, refresh tokens, session vs token authentication, and secure API practices. Lab includes building a login/signup system with JWT.

Module 14: Full Stack MERN Integration

React + Express integration, CORS handling, environment variables, secure API connections, and project structuring. Lab includes building a complete full stack CRUD MERN application.

Module 15: File Uploads and Media Handling

File uploads using Multer, Cloudinary integration, profile image uploads, and media optimization. Lab includes building a user profile system with image upload support.

Module 16: Deployment and Environment Management

Frontend deployment using Vercel/Netlify, backend deployment using Render/AWS basics, MongoDB Atlas connection, production configuration, and CI/CD introduction using GitHub Actions. Lab includes deploying a full MERN application.

Module 17: Full Stack Best Practices

Clean code, modular architecture, debugging, logging, API documentation using Swagger, security practices including Helmet and rate limiting, and testing introduction. Lab includes API documentation using Swagger and Postman.

Module 18: Capstone Project Development

Participants will develop a real-world full stack project such as an ecommerce platform, job portal, student management system, healthcare booking app, LMS portal, or food delivery system. Capstone must include authentication with roles, CRUD operations, filtering/search, deployment, GitHub repository setup, and professional documentation.