



TECHNOCATION FREELANCING TRAINING INSTITUTE & SOFTWARE HOUSE

Professional Mern-Stack Web Development Course Outline

Module 1: Introduction to MERN Stack Development

- What is MERN Stack? (MongoDB, Express.js, React.js, Node.js)
 - Understanding Full-Stack Development
 - Setting Up the Development Environment (VS Code, Git, Node.js, MongoDB)
 - Introduction to RESTful API & MVC Architecture
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Module 2: Front-End Development with React.js

React Basics

- Introduction to React & JSX
- Functional vs. Class Components
- Props & State Management
- Event Handling & Forms

Advanced React Features

- React Hooks (useState, useEffect, useContext)
 - React Router (Navigation & Dynamic Routing)
 - State Management with Redux & Context API
 - API Integration using Axios & Fetch
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Module 3: Styling in React.js

- CSS Modules & Styled Components
 - Using Bootstrap & Tailwind CSS in React
 - Material UI & Chakra UI for Component Styling
 - Responsive Web Design & Media Queries
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Module 4: Back-End Development with Node.js & Express.js

- Introduction to Node.js & npm
 - Building an Express.js Server
 - Middleware & Routing in Express
 - Handling HTTP Requests & Responses
 - Error Handling & Logging
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Module 5: Database Management with MongoDB & Mongoose

- Introduction to MongoDB & NoSQL Databases
 - CRUD Operations (Create, Read, Update, Delete)
 - Connecting MongoDB with Express using Mongoose
 - Data Modeling & Schema Design
 - Indexing & Performance Optimization
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Module 6: RESTful API Development

- Creating APIs with Express & Node.js
 - Handling Requests & Responses (GET, POST, PUT, DELETE)
 - Authentication & Authorization (JWT & OAuth)
 - Uploading & Storing Files (Multer, Cloudinary, AWS S3)
 - Implementing Role-Based Access Control (RBAC)
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Module 7: Full-Stack Integration

- Connecting React Front-End with Node.js & Express Back-End
- Fetching & Displaying Data from MongoDB

- Handling Forms & User Inputs
 - Deploying a Full-Stack MERN Application
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Module 8: Authentication & Security

- User Authentication (JWT, OAuth, Session-Based Auth)
 - Hashing Passwords with bcrypt.js
 - Securing APIs & Preventing Attacks (XSS, CSRF, SQL Injection)
 - Implementing Secure Cookies & HTTPS
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Module 9: Real-Time Features & WebSockets

- Introduction to WebSockets & Socket.io
 - Building a Real-Time Chat Application
 - Notifications & Live Updates in MERN Stack
 - Implementing Push Notifications
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Module 10: Deployment & DevOps

- Hosting Front-End & Back-End (Vercel, Netlify, Heroku, AWS)
 - Connecting to a Remote MongoDB Database (MongoDB Atlas)
 - CI/CD Pipeline Setup (GitHub Actions)
 - Environment Variables & Deployment Security
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Module 11: Advanced MERN Stack Development

- GraphQL vs. REST API
 - Microservices & Serverless Architecture
 - Progressive Web Apps (PWAs)
 - Performance Optimization (Lazy Loading, Code Splitting)
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Module 12: Final Project & Career Preparation

- Developing a Full-Stack MERN Application (E-commerce, Dashboard, Blog, Social Media App)
- Debugging & Performance Optimization
- Preparing for MERN Stack Developer Job Interviews
- Portfolio Building & Resume Optimization