



Excellence Educational Academy

Alipore, Kolkata

*[Where **TALENT** is the keyword]*

Sister Concern is



e-DIGITAL LEARNING

AN INSTITUTE FOR MULTIDISCIPLINE TECHNICAL COACHING CLASSES & GUIDANCE
[Founded and Directed by a Renowned Academicians & Corporate Professionals]

Ref. No. : EEA/TTD-MS/IT/2024

Date : 10/11/2024

IT Professional Corporate Training Curriculum for IT/Non-IT Participants

Name of the Corporate Training : **Full-Stack Development (MERN Stack)**

Course Duration: 120 hours

Course Code: TTD-MS

Target Audience: Students, corporate trainees, or professionals seeking to learn full-stack development using the MERN stack.

Prerequisites: Basic understanding of HTML, CSS, and JavaScript.

Course Outline

Module 1: Introduction to Full-Stack Development

- **Topics Covered:**
 - Overview of web development
 - Front-end vs. back-end development
 - Introduction to MERN stack (MongoDB, Express.js, React.js, Node.js)
- **Milestone 1 Project:**
 - Create a simple static website using HTML and CSS.

Module 2: JavaScript Fundamentals

- **Topics Covered:**

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- JavaScript syntax and operators
- Control structures (if statements, loops)
- Functions and scope
- Introduction to ES6 features
- **Milestone 2 Project:**
 - Develop a JavaScript quiz application.

Module 3: Version Control with Git

- **Topics Covered:**
 - Introduction to Git and GitHub
 - Setting up a Git repository
 - Basic commands (clone, commit, push, pull, branch)
 - Collaborating using GitHub
- **Milestone 3 Project:**
 - Create a GitHub repository and push the quiz application.

Module 4: Introduction to Node.js

- **Topics Covered:**
 - Understanding Node.js and its environment
 - Setting up a Node.js application
 - Introduction to npm and package management
 - Event-driven architecture
- **Milestone 4 Project:**
 - Build a simple REST API using Node.js.

Module 5: Express.js Framework

- **Topics Covered:**
 - Introduction to Express.js
 - Setting up routes and middleware
 - Handling requests and responses
 - Error handling in Express
- **Milestone 5 Project:**
 - Enhance the REST API with additional routes and error handling.

Module 6: MongoDB Basics

- **Topics Covered:**
 - Introduction to NoSQL databases
 - Setting up MongoDB
 - CRUD operations with MongoDB
 - Introduction to Mongoose for ODM
- **Milestone 6 Project:**
 - Integrate MongoDB with the REST API for data persistence.

Module 7: Introduction to React.js

- **Topics Covered:**
 - Understanding React.js fundamentals
 - Components, props, and state
 - Introduction to JSX
 - Building a simple React application
- **Milestone 7 Project:**
 - Create a simple single-page application (SPA) using React.

Module 8: Advanced React Concepts

- **Topics Covered:**
 - Component lifecycle methods
 - Handling events in React
 - Conditional rendering and lists
 - Introduction to hooks (useState, useEffect)
- **Milestone 8 Project:**
 - Refactor the SPA to use hooks and lifecycle methods.

Module 9: State Management with Redux

- **Topics Covered:**
 - Introduction to Redux
 - Understanding actions, reducers, and the store
 - Connecting React with Redux
 - Middleware in Redux (redux-thunk)
- **Milestone 9 Project:**
 - Implement Redux for state management in the React application.

Module 10: Full-Stack Integration

- **Topics Covered:**
 - Connecting front-end and back-end
 - Making API calls from React to the Express server
 - Understanding CORS and security considerations
 - Authentication and authorization basics
- **Milestone 10 Project:**
 - Develop a full-stack application integrating React, Express, and MongoDB.

Module 11: Deployment and DevOps Basics

- **Topics Covered:**
 - Introduction to deployment options (Heroku, Vercel, Netlify)
 - Environment variables and configuration
 - Basic DevOps principles

- Monitoring and maintaining applications
- **Milestone 11 Project:**
 - Deploy the full-stack application to a cloud service.

Module 12: Final Project Presentation and Review

- **Topics Covered:**
 - Presenting the final project
 - Best practices in full-stack development
 - Future learning paths and resources
 - **Final Project:**
 - Build a comprehensive full-stack application that incorporates all the learned technologies and concepts, focusing on a real-world problem.
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Assessment and Evaluation

- Milestone Projects: 60% of final grade
- Final Project: 30% of final grade
- Participation and Attendance: 10% of final grade

Resources

- Recommended Books:
 - "Eloquent JavaScript" by Marijn Haverbeke
 - "You Don't Know JS" (book series) by Kyle Simpson

Course Delivery

- Method: Blended learning (theory and practical)
- Format: Lectures, hands-on coding sessions, and project work