



# MERN STACK

DURATION  
**90 Days**

**Career Track :** Full Stack Developer

**Mode :** Online / Classroom

**Certification :** Skill Ascent – Certificate of Completion

## Become a Certified Full Stack Developer with MERN

The MERN Stack Development Program is a comprehensive, industry-oriented course designed to equip you with end-to-end web development skills using the MongoDB, Express.js, React.js, and Node.js stack. This program is perfect for aspiring full stack developers who want to build dynamic, responsive, and scalable web applications.

Through hands-on projects, real-world scenarios, and practical coding exercises, you will learn how to:

- ▶ Build modern web applications with a robust backend and dynamic frontend
- ▶ Work with MongoDB for database management
- ▶ Implement server-side logic using Node.js and Express.js
- ▶ Develop interactive user interfaces with React.js
- ▶ Integrate APIs and implement RESTful services
- ▶ Deploy full-stack applications for real-world usage

By the end of the course, you will have a portfolio of live projects demonstrating your expertise in full stack development, making you industry-ready for roles like Full Stack Developer, Web Developer, or Software Engineer.

# Course Introduction

## Understanding Full Stack Development

- What is Full Stack Web Development?
- What is a Web Application?
- Roles & Responsibilities of a Full Stack Developer
- Types of Applications
  - Standalone Applications
  - Web Applications
  - Mobile Applications
- High-Level Architecture of Web Applications
- Technologies Used in Web Development
- Introduction to MERN Stack (MongoDB, Express, React, Node)
- Developer Tools Setup
  - VS Code Installation
  - Required Extensions
  - Node.js Installation
  - Git & GitHub Setup

## Module 1: HTML5 – Structure of the Web

### HTML Fundamentals

- Introduction & Purpose of HTML
- HTML Elements & Tags
- Structure of an HTML Document
  - Document Declaration
  - Head & Body
  - Scope of HTML

### Types of Tags

- Paired Tags
  - Opening Tag
  - Closing Tag
- Self-Closing Tags

## Core HTML Elements

- Heading Elements
- Paragraph Element
- Button Element
- Anchor Element (Inter & Intra Navigation)
- Image Element
  - Attributes: src, alt, width, height, title, id, class
- Table Element
  - Table Head, Body, Footer
  - Rows, Cells, Caption
  - Attributes: colspan, rowspan, align

## Lists in HTML

- Ordered List
- Unordered List
- Description List
- Attributes & Markers

## Forms & Inputs

- Form Element
- Input Types
- Select, Option, Optgroup
- Textarea, Label
- Input Attributes
  - required, placeholder, pattern, minlength, maxlength, readonly, disabled

## Media & Semantic Elements

- Audio & Video
- Header, Footer, Main, Section, Nav, Article, Aside

## Module 2: CSS3 – Styling & Layout

### CSS Basics

- What is CSS?
- Purpose & Advantages of CSS
- Separation of Content and Design
- CSS Syntax & Rules

### CSS Selectors

- Universal Selector
- Tag Selector
- Class Selector
- ID Selector
- Group Selector
- Descendant & Child Selector

### CSS Box Model

- Margin
- Padding
- Border
- Width & Height

### Layout Techniques

- Positioning
  - Static, Relative, Absolute, Fixed, Sticky
- Flexbox
  - Flex Direction
  - Justify Content
  - Align Items
  - Order & Flex Basis
- Grid Layout
  - Grid Columns & Rows
  - Gap & Alignment

## Responsive Design

- Media Queries
- Breakpoints
- Orientation Handling

## CSS Effects

- Backgrounds & Colors
- Transforms (Translate, Rotate, Scale)
- Transitions
- Box Shadow

## Module 3: Bootstrap – Responsive UI

- Introduction to Bootstrap
- Grid System
- Typography
- Buttons
- Cards
- Forms
- Tables
- Pagination
- Modal
- Carousel
- Utility Classes
- Responsive Layout Design

## Module 4: JavaScript – Programming Fundamentals

### JavaScript Basics

- What is JavaScript?
- Variables (var, let, const)
- Data Types
- Operators
- Control Statements
- Loops

## Functions

- Function Declaration
- Parameters & Arguments
- Arrow Functions
- Callback Functions
- Higher Order Functions
- Async Functions

## Arrays & Objects

- CRUD Operations
- Array Methods
  - map, filter, forEach, slice, splice
- Object Methods
- Spread & Rest Operators
- Destructuring

## DOM Manipulation

- DOM Structure
- Selecting Elements
- Modifying Content
- Creating & Removing Elements

## Advanced JavaScript

- Scope & Closures
- this Keyword
- Call, Apply, Bind
- Promises
- Async / Await
- Fetch API
- Modules (Import & Export)

## Module 5: React JS – Frontend Development

### React Fundamentals

- Introduction to React
- Virtual DOM
- JSX
- Components (Functional & Class)
- Props & State

### Hooks

- useState
- useEffect
- useContext
- useRef
- useReducer

### Routing

- React Router
- BrowserRouter
- Routes & Route
- Nested Routing
- useParams & useNavigate

### Forms & Data Handling

- Controlled Components
- Axios Integration
- API Consumption
- Context API
- Redux Basics

### Performance

- Lazy Loading
- Optimization Techniques

## Module 6: Backend – Node.js & Express.js

### Node.js Fundamentals

- ➔ JavaScript Runtime
- ➔ Event Loop
- ➔ Asynchronous Programming
- ➔ Modules
- ➔ File System
- ➔ HTTP Module

### Express.js

- ➔ Creating Servers
- ➔ Routing
- ➔ Middleware
- ➔ REST API Development
- ➔ Error Handling
- ➔ Authentication & Authorization
- ➔ JWT Implementation

## Module 7: MongoDB & Mongoose

### MongoDB Basics

- ➔ NoSQL Concepts
- ➔ CRUD Operations
- ➔ Data Types
- ➔ Relationships
- ➔ Embedded Documents

### Advanced MongoDB

- ➔ Operators
- ➔ Indexing
- ➔ Aggregation Pipeline
- ➔ Text Search

## Mongoose

- Schemas & Models
- Validation
- CRUD with Mongoose
- Relationships

## Module 8: MERN Integration & Deployment

- MERN Architecture
- Connecting React with Backend
- JWT-based Authentication
- Role-Based Access
- Environment Variables
- Deployment
- Frontend: Vercel
- Backend: Render / AWS
- Git & GitHub Workflow

## Final Capstone Project

### End-to-End MERN Stack Application

- Authentication
- CRUD Operations
- API Integration
- Deployment
- Industry-Level Architecture

## Career Outcomes

- Full Stack Developer
- MERN Stack Developer
- React Developer
- Backend Developer
- Web Application Developer