

VERSION

2

**PROFESSIONAL**

ELYSIUM  
ACADEMY  
MERN  
STACK EXPERT  
**ELYSIUM  
ACADEMY**

**MERN  
STACK EXPERT**

ELYSIUM  
ACADEMY  
MERN  
STACK EXPERT

ELYSIUM  
ACADEMY

MASTER

**SR. CODE**

EAPL/PROF/PRTC04

**COURSE CODE**

EAPMR

**SUB CATEGORY**

FULL STACK DEVELOPMENT

  
TOTAL DURATION  
**90**  
HOURS

  
THEORY TAKEN  
**30**  
HOURS

  
PRACTICAL TAKEN  
**60**  
HOURS

## COURSE DESCRIPTION



Learn to build entire web applications from start to finish on one of the most versatile tech stacks: MongoDB, Express.js, React.js and Node.js (MERN stack). The first step toward becoming a MERN Developer is to learn the three foundational front end languages: HTML, CSS, and JavaScript. Each one of these programming languages can be learned through the documentation on the official website, online guides, video tutorials, or web development classes.

## COURSE GOALS



Learning MERN will help developers handle all aspects of web development projects, greatly expanding their career opportunities. It will also help developers build focused JavaScript web applications and make learning other elements of full stack development easier.

## FUTURE SCOPE



The MERN stack is a powerful and versatile technology stack that can help you build scalable and flexible web applications using only JavaScript. With its high demand, extensive resources, and future-proofing potential, it is definitely worth considering learning in 2023.

# 01

## CHAPTER

## GETTING STARTED

### O1. Web Development

- a. Full Stack Development
- b. Popular front-end development technologies
- c. Frontend and backend technology combinations for web development?
- d. Advantages of learning full stack development

### O2. About MERN

- a. What is MERN?
- b. Purpose of MEAN
- c. Advantages and disadvantages
- d. Applications of MERN
- e. Installation Setup

### O3. Basic Preliminaries of HTML

- a. Headers
- b. HTML Tags
- c. Attributes
- d. Tags vs. Elements
- e. Primary tags
- f. Formatting tags
- g. Color coding
- h. Div Tag
- i. Span Tag
- j. Hands on tags



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## O4. HTML Lists and URLs

- a. Unordered Lists
- b. Ordered Lists
- c. Definition list
- d. Absolute URLs
- e. Relative URLs
- f. HTML images
- g. Image mapping

## O5. HTML Table and Frames

- a. List the Table tags
- b. Frames
- c. Frame Tags
- d. Hands on Table and Frames
- e. Forms
- f. Forms Elements
- g. Hands on Forms

# 02

CHAPTER

## CSS

### O1. About CSS

- a. Benefits of CSS
- b. CSS Versions History
- c. CSS Syntax
- d. Inline
- e. Internal
- f. External
- g. How to link CSS



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## **O2. CSS Selectors**

- a.ID Selectors
- b.Class Selectors
- c.Grouping Selectors
- d.Universal Selector
- e.Descendant / Child Selectors
- f. Attribute Selectors
- g.Hands on selectors

## **O3. Background color**

- a.background-image
- b.background-repeat
- c.background-position
- d.CSS Cursor
- e.Hands on background color

## **O4. Text Fonts**

- a.color
- b.background-color
- c.text-decoration
- d.text-align
- e. vertical-align
- f. text-indent
- g.text-transform
- h.white space
- i. letter-spacing
- j. word-spacing
- k.line-height

- l. font-family
- m. font-size
- n. font-style
- o. font-variant
- p. font-weight
- q. Hands on Text fonts

## **O5. List Tables**

- a. list-style-type
- b. list-style-position
- c. list-style-image
- d. list-style
- e. CSS Tables
  - border
  - width & height
  - text-align
  - vertical-align
  - padding
  - color
- f. Hands on List tables

## **O6. Box model and display positioning**

- a. Borders & Outline
- b. Margin & Padding
- c. Height and width
- d. CSS Dimensions
- e. CSS Visibility
- f. CSS Display
- g. CSS Scrollbars

#### h. CSS Positioning

- Static Positioning
- Fixed Positioning
- Relative Positioning
- Absolute Positioning

#### i. CSS Layers with Z-Index

#### j. Hands on Box model and positioning

#### k. The float Property

#### l. The clear Property

#### m. The clear fix Hack

#### n. Hands on float

# 03

## CHAPTER

## JAVASCRIPT

### 01. Overview of JavaScript

- a. What is JavaScript?
- b. Purpose of JavaScript
- c. Advantages and Disadvantages
- d. About versions
- e. Structure of JavaScript
- f. How to add JavaScript in HTML?

### 02. Data types and variables

- a. Comments
- b. Keywords and reserved words
- c. Variable declaration
- d. Data Types
- e. Type Conversion

  
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- f. Key Difference between Var, Let, and Const
- g. Hands on data types
- h. Hands on Var, Let and Const

### **O3. Operators**

- a. What are operators?
- b. Types of operators
- c. Assignment operators
- d. Purpose of assignment operators
- e. Types of Assignment operators
- f. Hands on Assignment operators
- g. Comparison operators
- h. Types of comparison operators
- i. Hands on comparison operators

### **O4. Logical and Conditional operators**

- a. What is logical operators?
- b. Purpose of logical operators
- c. Types of Boolean operators
- d. Hands on Boolean operators
- e. Conditional operators
- f. Purpose of conditional operators
- g. Hands on conditional operators

### **O5. Bitwise and unary operators**

- a. What is Bitwise operators?
- b. Purpose of Bitwise operators
- c. Types of Bitwise operators
- d. Hands on Bitwise operators

- e. Unary operators
- f. Purpose of unary operators
- g. Hands on unary operators
- h. Types of operators
- i. Operator Precedence

# 04

## CHAPTER

## **JAVA SCRIPT STATEMENTS**

### **O1. Conditional Statements**

- a. If
- b. If else
- c. Switch
- d. Hands on conditional statements

### **O2. Loop Statements**

- a. While Loop
- b. Do while Loop
- c. For loop
- d. Nested for loops
- e. For In loop
- f. For Of loop
- g. Break statement
- h. Continue statement
- i. Hands on loop statements

### **O3. Functions**

- a. What is function in JavaScript?
- b. Call a function using arguments



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- c. Pass by value
- d. Return statement
- e. Nested functions
- f. Rest parameter
- g. Arrow functions

## O4. Objects

- a. Objects
- b. Types of objects
- c. Window objects
- d. Frame objects
- e. Document objects

# 05

CHAPTER

## EVENT AND DOM

### O1. Event Handling

- a. What is Event?
- b. How events work?
- c. Create and change event handler
- d. Mouse events
- e. Keyboard events
- f. The onLoad and onUnload Events
- g. Form events
- h. Event simulation
- i. Event capturing
- j. Event bubbling
- k. Hands on events



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## **O2. DOM**

- a. What is DOM?
- b. DOM Methods
- c. DOM Documents
- d. DOM elements
- e. DOM CSS
- f. DOM Collections
- g. DOM events
- h. DOM Event Listener
- i. Hands on DOM

## **O3. Bootstrap**

- a. What is bootstraps?
- b. Purpose of bootstraps
- c. Containers
- d. Tables, Images
- e. Colors, Alerts, Buttons
- f. Panels
- g. Spinners, Cards
- h. Drop down, Navbar

# 06

## CHAPTER

## **EXPRESS AND NODE JS**

### **O1. About Express**

- a. What is Express JS?
- b. Why use Express JS?
- c. Structure of Express JS
- d. Installation setup

### **O2. Important Terminology**

- a. Express JS Request
- b. Express.js Response
- c. Get, post
- d. Routing and cookies
- e. File Upload and Middleware
- f. Express.js Scaffolding
- g. Express.js Template

### **O3. Overview Node JS**

- a. What is Node JS?
- b. Purpose of Node JS
- c. Advantages and drawbacks
- d. Structure of Node JS
- e. Installation Setup

### **O4. Node JS Modules**

- a. Functions
- b. Buffer
- c. Module
- d. Modules Types
- e. Core Modules
- f. Local Modules
- g. Modules Exports



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## **O5. Node JS Package Manager**

- a. What is NPM
- b. Installing Packages Locally
- c. Installing package globally
- d. Adding dependency in package Json
- e. Updating packages

## **O6. Creating web server and file system**

- a. Creating web server
- b. Sending and Handling HTTP requests
- c. Read file
- d. Writing a file
- e. Opening a file
- f. I/O operations
- g. Core Node JS Debugger

## **O7. Events**

- a. Event Emitter class
- b. Inheriting Events
- c. Returning event emitter
- d. Serving Static Files
- e. Working with Middle Ware
- f. Hands on events

# 07

## CHAPTER

## **REACT JS – PART 1**

### **O1. About React JS**

- a. What is React JS?
- b. Why we used React JS?
- c. Advantages and drawbacks
- d. React Versions
- e. Structure of React JS
- f. Installation setup

### **O2. About Components**

- a. Significance of component architecture
- b. Types of components
- c. Functional
- d. Class based
- e. Pure
- f. Component Composition
- g. Hands on Component

### **O3. React Components**

- a. React component Properties
- b. Component Lifecycle
- c. Updating Components
- d. Mounting Components
- e. Hands on components

### **O4. JSX**

- a. Expressions & Attributes
- b. JSX Basics



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- c. Namespaced Components
- d. Rendering HTML
- e. Rendering React Components
- f. Fragments

## **O5. Common Terminologies**

- a. What is state and props?
- b. Purpose of state and props
- c. Validating props using prop Types
- d. Event handling
- e. Life cycle methods
- f. Handle errors using error boundaries
- g. Context
- h. Purpose of context
- i. Create context
- j. Hooks
- k. Purpose of hooks
- l. Create hooks
- m. Types of hooks
- n. Hands on context and hooks

## **O6. React Router**

- a. Navigating Pages
- b. Understanding React Dom
- c. Types of Router

# 08

## CHAPTER

### **MONGO DB PART-1**

#### **O1. About Mongo DB**

- a. What is Mongo DB?
- b. No SQL Database
- c. Advantage over RDBMS
- d. MongoDB Data Types
- e. MongoDB Data Modeling
- f. Installation setup

#### **O2. Mongo DB Operators and commands**

- a. Incorporating the Router
- b. Nesting Routes
- c. Route Parameters
- d. Express Middleware
- e. Responding with JSON
- f. Express with View Engine
- g. API/ Server-Side rendering

#### **O3. Database and collections**

- a. Create database
- b. Drop Database
- c. Create collections
- d. Drop collections
- e. Hands on database and collections



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## O4. CRUD Operations

- a. CRUD Operations (Update and Delete)
- b. Data Modeling
- c. Model Tree Structure
- d. Schema Validation
- e. Hands on CRUD operations

## O5. Documents

- a. Insert documents
- b. Delete documents
- c. Update Documents
- d. Query Documents
- e. MongoDB text search
- f. Partial Updates & Document Limits
- g. Removing Documents
- h. Hands on documents

# 09

CHAPTER

## MONGO DB PART-2

### O1. Mongo DB shells

- a. MongoDB Shell
- b. Mongo Collection Methods
- c. Mongo Shell Methods
- d. Cursor methods
- e. Database methods
- f. Hands on Mongo DB shells



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## **O2. Replication and sharding**

- a. What is Replication?
- b. Replication Set Members
- c. Replication Data Availability
- d. Replication Set Deployment
- e. Member Configuration Deployment
- f. Export and Import Files
- g. Hands on Replication
- h. What is sharding?
- i. Hands on sharding

## **O3. Administrating Mongo DB**

- a. Administration
- b. MongoDB Back Methods
- c. Hands on

## **O4. Create New Project**

- a. Problem Understanding:  
E-Commerce Website
- b. How to create an application
- c. Build Front end
- d. Build back end
- e. Create Mongo DB
- f. Connecting React Applications to  
Back-End and build complete full-stack  
Applications

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