# MERN Stack Course Curriculum

## Java Script Training Course Content

### Section 1: Introduction to Web Application
- ➢ What is Web application?
- ➢ Architecture of Web Application.
- ➢ Difference between Scripting language and Programming language.
- ➢ Where to write JavaScript?

### Section 2: JavaScript Introduction
- ➢ Introduction to Client Side Scripting
- ➢ Introduction to JavaScript
- ➢ Display methods in JavaScript
- ➢ Variables in JavaScript
- ➢ Rules to create variables in JS
- ➢ What is varibale declaration and What is variable definition?
- ➢ Variable Scopes
- ➢ List of Data Types in JavaScript

### Section 3: JS Events
- ➢ What is Event in JS ?
- ➢ Onload, Onunload, Onsubmit, OnFocus, Onchange Event, Onblur Event, Onmouseover, Onclick, Ondbclick Events, etc.,

### Section 4: Functions in JavaScript
- ➢ What is function?
- ➢ How to define Functions in JS.
- ➢ What are the functions available in JS?
- ➢ Function Invocation Types.
- ➢ How to pass Parameters in Function

### Section 5: Inbuilt methods in JS
➢ String inbuilt methods
➢ Number and Math inbuilt methods
➢ Array inbuilt methods

### Section 6: JS Arrays
➢ What is Array ?
➢ How to retrieve Array Value ?
➢ How to Manipulate (Add, Edit, Delete) Array Elements ?
➢ Array Sort.

### Section 7: JS Objects
➢ What is Object in JS ?
➢ Object Structure in JS ?
➢ Object Properties and Methods.
➢ How to add New Properties and Methods in Existing Object ?
➢ 3 Types of Object Creation in JS.

### Section 8: Conditional and loops in JavaScript
➢ Conditions Statements (If, If Else, Switch)
➢ Java Script Loops (For Loop, While Loop, Do While Loop and for in loop)
➢ JS Popup Boxes (Alert, Prompt, Confirm)

### Hands-on Practicals:
➢ Client Side Form Validations.
➢ Simple Calculator using Switch Case.

### Section 10: Timer functions in JavaScript
➢ What is timer function?
➢ setTimeout() - overview
➢ setInterval() - overview

### Hands-on Practicals:
➢ Writing the program to read and write the data in text file.
➢ Simple Animation by using setInterval method.

➢ Timer by using setInterval and setTimeout

## Section 11: JSON
➢ What is JSON?
➢ Purpose of the JSON
➢ How to convert JS object into JSON object?
➢ How to convert JSON object into JS object?
➢ How to parse complex JSON Data Structure.

## Section 12: AJAX
➢ What is AJAX?
➢ Synchronous vs Asynchronous
➢ What is XMLHttpRequest Object?
➢ What are the properties and methods available in XMLHttpRequest Object?
➢ How to receive HTTP response?

## Hands-on Practicals:
➢ Get movie details from IMDB by using AJAX call.

# REACT JS - Program Curriculum

## Section 1:  What is React JS?
➢ React JS Introduction
➢ Advantages of React JS
➢ Work flow of React JS
➢ Scope of React JS

## Section 2: Overview of JSX
➢ Introduction of Virtual DOM.
➢ Difference between JS and JSX.
➢ React Components overview

➢ Containers and components
➢ What is Child Components?
➢ What is Namespaced components?
➢ What are the JavaScript expressions available in JSX?

## Section 3: React JS Environment Setups

➢ Node setup
➢ How to use NPM?
➢ How to create package.json and purpose of it?
➢ ES6 Introduction and features.
➢ Webpack Overview
➢ Best IDE for React JS and How to write optimised code in React JS?
➢ React JS browser plugins overview.

## Section 4:  A Real-Time Application by using React JS

➢ Create a React component with JSX template.
➢ How to create Nested Components?
➢ What is React JS render?
➢ React Props overview.
➢ Introduction of Props validation with data types.
➢ Flow of States, Initialize states and update states.

## Section 5: React JS forms and UI

➢ Lists of Form components.
➢ Setup Controlled and Uncontrolled form components.
➢ Control Input elements.
➢ How to set default values on all formats of Input elements.
➢ React JS Form validations.
➢ How to write Styles?
➢ Animations overview

## Section 6: React JS Component Life Cycles Overview

➢ Initial Render
➢ Props Change

- ➢ Stage Change
- ➢ Component willMount
- ➢ Component didMount
- ➢ Component Unmount

## Section 7: Routing in React JS and Other JS concepts

- ➢ Single Page Application Overview.
- ➢ How to configure React Router?
- ➢ History of Router
- ➢ How to Handle Conditional Statements in JSX?
- ➢ IIFE in JSX for complex logic overview.

## Section 8 : Event Handling in JSX

- ➢ onBlur, onKeyUp, onChange and other useful primary events in React JS.
- ➢ How to share events between the components?

## Section 9 :  How to write Styles in React JS?

- ➢ CSS and inline styles in React JS overview.
- ➢ Introduction to styled components

## Section 10 : React Router with Navigation

- ➢ How to Load the router library?
- ➢ Configure the React Router?
- ➢ How to Pass and receive parameters?
- ➢ Integration of React-cookie overview.

## Section 11 : Flux, Redux overview

- ➢ What is Flux Architecture?
- ➢ What are the Flux Components available?
- ➢ Stores.
- ➢ Dispatchers.
- ➢ iew Controllers.
- ➢ Actions.

➢ Views.

➢ How Flux works?

➢ Flux and React works together.

➢ Introduction to One Store.

➢ Provider Component

➢ Actions.

➢ Reducers.

➢ sagas

➢ Dispatchers

➢ View Controllers

➢ Selectors

## Section 12 : Unit Testing Overview

➢ What are the necessary Tools required for Unit Testing?

➢ React Unit Testing overview

➢ Introduction to JEST

➢ How to Test React Component?

➢ How to Test React Router?

## Section 13 : Integration with other libraries

➢ Gulp & Browserify

➢ React with jQuery

➢ React & AJAX

## Section 14 : React Server Integration with Deployment

➢ https

➢ httpster

➢ npm

## Section 15 : Hooks

➢ Understanding Hooks

➢ The useState hook

➢ Side effects using the useEffect hook

➢ The useContext hook

➢ The useReducer hook
➢ Writing your own hook

## Section 16 : Code Spliting
➢ Code splitting & Suspense
➢ Route Based Code Splitting
➢ Lazy Loading

## Section 17 : Isomorphic React
➢ Server Side Rendering
➢ SSR with React - Setup & Server
➢ SSR with React - The Toolchain

## Section 18 : Testing Component
➢ Using Jest with Test Utils from React-DOM
➢ Using Jest with the React Testing Library
➢ Using Jest with Enzyme

## Section 19 : Epilogue
➢ The React ecosystem

## Section 20 : New Features of React 16
➢ Handling exceptions in components
➢ Error boundaries

## Section 21 : Webpack Primer and Isomorphic React
➢ Webpack and its use
➢ Setting up and installing Webpack
➢ Working with the configuration file of Webpack
➢ Working with loaders
➢ Quick word on lazy loading, code splitting, and tree shaking
➢ Setting up a hot module replacement
➢ Server-side rendering (SSR)

➢ Working with renderToStaticMarkup and renderToString methods

## Section 22 : Fetch data using GraphQL

➢ What is GraphQL?
➢ Cons of Rest API
➢ Pros of GraphQL
➢ Frontend backend communication using GraphQL
➢ Type system
➢ GraphQL data types
➢ Modifiers
➢ SchemasGraphiQL tool
➢ Express framework
➢ NPM libraries to build server side of GraphQL
➢ Build a GraphQL API
➢ Apollo client
➢ NPM libraries to build client side of GraphQL
➢ How to setup Apollo client

# Node JS - Program Curriculum

## Section 1: Introduction to Node World

➢ Introduction to Javascript event driven programming
➢ Introduction to Node event -driven programming

## Section 2: Making a web server

➢ Webserver basis
➢ How to set up a router?
➢ Serving static files / pages
➢ Content caching
➢ Streaming and optimization
➢ File System Security issues and measures

## Section 3: HTTP Object
- ➢ Introduction to HTTP Object
- ➢ Processing POST Data
- ➢ Handling File uploads
- ➢ Using Node as HTTP Client
- ➢ Implementing download Throttling

## Section 4: Working with Data Serialization
- ➢ JSON to Object & Object to JSON
- ➢ XML to Object and Object to XML
- ➢ Explanation Browser to Server communication

## Section 5: Working with Databases
- ➢ Writing to a CSV File in Database
- ➢ Working with MYSQL Server in Databases

## Section 6: Web Development with Express
- ➢ Express scaffolding
- ➢ Defining and applying environments
- ➢ Dynamic routing
- ➢ Templating IN Express
- ➢ CSS engines with Express
- ➢ Initializing and using sessions
- ➢ Demo of making an Express web application
- ➢ File System Security issues and measures

## Section 7: All about Security
- ➢ Basic Authentication methods
- ➢ Passwork cryptography
- ➢ Setting up HTTPS
- ➢ How to safegaurd your site from cross-site forgeries

## Section 8: Advanced Network Concepts
- ➢ Sending Emails

- ➢ Sending SMSs
- ➢ Communicating with TCP
- ➢ Creating your own SMTP Server
- ➢ Virtual Hosting Environment

## Section 9: Writing customized Node Modules
- ➢ Creating a test driven Module Mock-up
- ➢ Writing a functional mdoule
- ➢ Extending the module's API
- ➢ Deploying a  module to npm

## Section 10: Getting it to production
- ➢ How to set up production server environment
- ➢ How to set up auto crash recovery
- ➢ Continous Deployment in Node

# MongoDB TRAINING COURSE CONTENT

## Section 1: Introduction to MongoDB
- ➢ Introduction
- ➢ Downloading
- ➢ First Run
- ➢ Command Line Options
- ➢ Install As Service
- ➢ Verify Server
- ➢ Database is Namespace
- ➢ Getting Help in the Shell
- ➢ Replica Sets
- ➢ Configuring a Replica Set
- ➢ Verifying Replication Works
- ➢ Replica Set Failover

## Section 2: The Mongo Shell

- ➤ Shell Role in Ecosystem
- ➤ Shell Modes
- ➤ Shell Invoking Syntax
- ➤ Using Eval
- ➤ Substantial Scripts
- ➤ Execute Script Before Enter
- ➤ Shell Keys and Shortcuts
- ➤ Multiline Editing
- ➤ External Editor Integration
- ➤ Load Script from Within
- ➤ User RC File
- ➤ Common Safety Usage Tip
- ➤ Shell Alternatives

## Section 3: Saving Data

- ➤ Overview
- ➤ Storage
- ➤ BSON
- ➤ Saving Documents
- ➤ Collections
- ➤ Document Id
- ➤ ObjectId
- ➤ Insert
- ➤ Insert with Id
- ➤ Complex Document
- ➤ Save Danger
- ➤ Update Command
- ➤ Update Demo
- ➤ Set Operator
- ➤ Unset Operator
- ➤ Rename Operator

- ➢ Index Theory
- ➢ Sort Uses Index
- ➢ Index Types
- ➢ Create Index
- ➢ system.indexes collection
- ➢ explain()
- ➢ nscanned
- ➢ Multi-Term Query
- ➢ Comparison
- ➢ Scanned vs. Returned
- ➢ dropIndex()
- ➢ Nested Fields
- ➢ Array Field
- ➢ Sort
- ➢ Unique
- ➢ Sparse
- ➢ Compound
- ➢ Sort Direction
- ➢ Covering Index
- ➢ Dead Weight
- ➢ Background build
- ➢ Index Name
- ➢ Conclusion