

EdYoda

Full Stack Developer Program

Program Curriculum

(MERN Stack)

Learning outcomes:

- Strong fundamental concepts of Frontend Development
- Strong fundamental concepts of Server-side Development using REST APIs
- Work with database seamlessly
- Create beautiful end to end websites
- Gain Industry standard knowledge

HTML

1. Introduction to WEB

- What is Web?

2. HTML Basics

- Introduction
- Editors
- HTML Document Structure(DOM)
- Elements(Tags)
- Attributes
- Headings
- Paragraphs
- Formatting
- Media
- Lists
- Tables
- iframes
- Layout
- Head
- Meta
- Links
- Scripts
- CSS
- JavaScript
- HTML XHTML
- HTML4 Drawbacks

3. HTML5 Introduction

- What is HTML5 ?

- New Features and groups
- Backward Compatibility
- Why HTML5?
- Power of HTML5

4. HTML5 Detailed:

- HTML5 Mark - up
- New Semantic/Structural Elements
- Canvas
- SVG
- APIs
- Inputs
- Forms

5. HTML5 Mark-up:

- New & Updated Elements
- Structural Elements
- New Attributes

6. HTML5 New Semantic/Structural Elements

- Introduction
- What are Semantic Elements?
- non-semantic elements: <div> and
- semantic elements:
 - <form>,
 - <table>,
 - ,
 - <article>
 - <aside>
 - <bdi>
 - <command>
 - <details>
 - <dialog>
 - <summary>
 - <figure>
 - <figcaption>
 - <header>
 - <footer>
 - <mark>
 - <meter>
 - <nav>
 - <progress>
 - <section>
 - <time>

7. HTML5 Forms:

- Form Elements
- Input Types
- Input and Form Attributes
- Form validation

8. HTML5 Form Elements

- <input>
- <select>
- <multiple>
- <textarea>

9. HTML5 Input Types

- Introduction
- color
- email
- number
- range
- search
- submit
- password
- tel
- url
- date
- month
- time
- week

10. HTML5 Form Attributes

- New attributes for <form>:
- autocomplete
- novalidate

11. New attributes for <input>

- autocomplete
- autofocus
- form, formaction
- formtarget
- height and width
- list, min and max
- multiple

- pattern (regexp)
- placeholder
- required, step

12. HTML5 Multimedia : Audio and Video

- New Media Elements
- <audio>
- <video>
- <source>
- <embed>
- <track>

13. HTML5 Canvas

- What is Canvas?
- Canvas Coordinates
- Drawing Linear Paths, Arcs, Curves
- Drawing : Shapes, Text, Gradients, Images, Video

14. HTML5 SVG

- What is SVG?
- SVG Advantages
- Differences and/or Comparison Between SVG and Canvas

15. HTML5 APIs

- Drag/Drop
 - Introduction
 - Make an Element Draggable
 - What to Drag?Where to Drop?
- HTML5 Geo location
 - Introduction
 - Locate the User's Position+
 - Handling Errors and Rejections
 - The getCurrentPosition()
 - Geolocation object
- HTML5 Web Storage
 - What is HTML5 Web Storage?
 - The localStorage Object
 - The sessionStorage Object

- HTML5 App Cache
 - What is Application Cache?
 - Cache Manifest Basics
 - HTML5 Cache Manifest

CSS

1. CSS 1.0 and 2.0

- CSS Basics
- CSS Introduction
- CSS Syntax
- CSS Id, Class
- CSS Styling
- Styling Backgrounds, Text, Fonts, Links, Lists and Tables
- CSS Border

2. CSS3

- Introduction
- CSS3 Modules
- Selectors
- Box Model
- Text Effects
- 2D/3D Transformations
- Perspectives
- Animations
- Flex Box
- CSS Grid
- User Interface
- Borders
- border-radius
- box-shadow
- border-image
- CSS3 Backgrounds

3. CSS3 Text Effects

- text-shadow
- word-wrap

4. CSS3 Fonts

- @font-face Rule

- Font Properties: Font Size, Font Weight, Font Stretch

5. CSS3 Transforms

- Browser Support
- 2D Transforms : translate, rotate, scale, skew, matrix
- 3D Transforms : rotateX, rotateY(), rotateZ(), scaleX(), scaleY(), scaleZ()

6. CSS3 Transitions

- transition-property

7. CSS3 Animations

- CSS3 @keyframes Rule
- Browser Support
- Animation Attributes: duration, fill, delay, etc

8. CSS3 User Interface

- box-sizing
- Outline-offset

9. CSS3 Media Queries

Javascript

1. Javascript Introduction and Basics

- What is JavaScript
- Role in Web Development
- What is ES5 and ES6?

2. Data Types and Variables

- Variable Naming and Rules
- Numbers in JS
- Number In-built Functions
- Strings in JS
- String In-built Functions
- Null and Undefined

3. Expressions and Operators

- Assignment
- Arithmetic
- Logical
- Comparison
- Coercion

4. Control structures and conditional statements

- If-else
- Switch
- For loop
- Break and Continue
- While loop

5. Objects and Arrays

- Creating an object
- Accessing values from object
- this keyword
- Creating Arrays
- Array In-built Functions

6. Functions and Methods

- Writing our own Functions
- Environment and Scope
- Hoisting
- Arrow Functions

- Closure
- Higher Order Functions

7. OOPS basics

- The “class” Keyword
- Polymorphism
- Inheritance
- Symbols
- Getter and Setters

8. Browser Object Model

- What is BOM
- The “window” Object
- The “screen” Object
- The “location” Object
- The “history” Object
- The “navigator” Object
- Cookies

9. Document Object Model

- DOM Structure
- Finding & Updating Elements
- Creating Nodes
- Updating Styles
- Query Selectors

10. Events

- Event Handlers
- The “event” Object
- Default Actions
- Key Events
- Pointer Events
- Touch Events
- Scroll Events
- Focus Events
- Load Events
- Timers

11. Pattern Matching with Regular Expressions

- What is Regular Expression
- Regex Objects in JS
- Modifiers and Brackets
- Metacharacters and Quantifiers

- Regex Object Methods

12. Errors and Strict Mode

- Handling Errors with try-catch
- The “throw” statement
- The “finally” statement
- What is “strict” mode
- How to declare strict mode
- What cannot be done if strict mode

13. AJAX and JSON

- What is AJAX?
- Making AJAX Requests
- Handling AJAX Response
- What is JSON?
- Rules to Write JSON
- JSON Object vs Array
- Parsing JSON

14. JQuery Basics

- What is jQuery
- Selectors and Filters
- Creating and Modifying Page Content
- Handling Events
- Animating Page Content

React, Redux

1. React Introduction:

- What is React?
- Understanding Single Page Applications and Multi Page Applications
- Real-World SPAs & React Web Apps

2. Base Features and Syntax:

- Build Workflow
- Create-React-App
- ESLint
- Component Basics
- Understanding JSX
- Functional Components
- Working with Props
- Lists in React

3. Styling and CSS Modules:

- Adding Styles with Stylesheets
- Adding Inline Styles
- Why CSS Modules for React
- Installing and Using CSS Modules
- Using Media Queries with CSS Modules

4. Components in Depth:

- Stateful vs Stateless Component
- Class-based vs Functional Component
- Component Lifecycle
- DOM vs Virtual DOM
- shouldComponentUpdate() for Optimization
- Pure Components
- Higher Order Component (HOCs)
- PropTypes

5. Debugging:

- Using Browser DevTools
- Working with React DevTools
- Using Error Boundaries

6. Connecting React App to Web

- HTTP requests in React
- Installing and Understanding Axios
- Async/Await
- Fetching data from Server
- Sending data to Server
- Deleting data on Server
- Global Configuration for Axios
- Handling Network Errors

7. Routing:

- Setting up React-Router
- Links
- Switch
- Passing Route Parameters
- Redirecting Requests
- Conditional Redirects
- Handling 404

8. Redux:

- Complexity of Managing State
- What is Flux?
- What is Redux? Why Redux for React?
- Understanding Redux Flow
- Setting up Reducer and Store
- Actions and Subscriptions
- Connecting Redux to React
- Updating State Immutably
- Handling Multiple Reducers

9. Testing:

- Intro to React testing
- Intro to test-utils
- Intro to Jest for testing React Apps

10. Build and Build Tools:

- Babel
- NPM
- Webpack
- Creating a Production Build

MongoDB

1. MongoDB Fundamentals
2. NoSQL and CAP Theorem
3. MongoDB database
4. MongoDB shell
5. MongoDB query language and Atlas
6. Reading and writing data
7. MongoDB BSON data types

NodeJS

1. Introduction to Node.js
 - What is Node.js?
 - Traditional Web Server Model
 - Node.js Process Model
 - Installation and Environment setup
 - Command Line Interface
2. Node.js Components
 - Routing in Node.js
 - Callbacks
 - Blocking and Non-blocking Functions
3. Node Js Modules
 - Functions
 - Buffer
 - Streams
 - Module and Module Types
 - Core Modules
 - Local Modules

- Importing Modules
- Module.Exports

4. Node Package Manager

- What is NPM
- Installing Packages Locally
- Adding dependency in package.json
- Installing packages globally
- Updating packages

5. Web server Creation

- Creating web server
- Handling http requests
- Sending requests

6. File System

- Fs.readFile
- Writing a File
- Writing a file asynchronously
- Opening a file
- Deleting a file
- Other IO Operations

7. Debugging Node.js Application

- Core Node.js debugger
- Debugging with Visual Studio

8. Events

- Event Loop
- EventEmitter class
- Returning event emitter
- Inhering events

9. Serving Static Resources

- Serving static file
- Working with middleware

10. Database connectivity

- Connection string
- Configuring Working with select command
- Node.js MongoDB with Mongoose

- Node.js MYSQL Database

11. Template Engines

- Why Template Engine
- What is Jade ?
- What is vash ?

12. RESTful API

- REST Architecture
- RESTful web services
- HTTP Methods : GET, POST, PUT, DELETE etc
- Data Validation and Sanitization

13. Authentication and Security

- Logging-in Users
- What is JSON Web Tokens
- Generating and Accepting Authentication Tokens
- Authenticating Endpoints
- Securely Storing Sensitive Data

Express.js

1. Express.js Framework

2. Configuring routes

3. Middlewares

4. Working with express

5. Request and Response

6. Creating RESTful API's: GET, POST, PUT and DELETE

7. Error Handlers

Mindset for Problem Solving

1. Mathematical Aptitude

- Percentages
- Profit and Loss
- Simple Interest and Compound Interest
- Work And Time
- Probability
- Permutation and Combination
- Profit and Loss
- Time & Speed
- Ratios and Proportions
- Data Interpretation

2. Art of Learning Anything

- What is Intelligence
- Relation of success with intelligence
- Illusion of Learning
- Focussed Mode vs Diffused Mode
- Procrastination
- Improving Recall
- Creating Brain Links
- Visual memory & Data Memory
- Slow Thinking

3. Computational Thinking

- Thinking before Doing/Coding
- Problem Identification
- Decomposition
- Pattern Recognition
- Abstraction
- Algorithm Design
- Computational Thinking Use Case 1
- Computational Thinking Use Case 2

4. Technical Puzzles

- Why are Puzzles part of interviews?
- The Art of solving puzzles
- Approach more important than the solution

- Puzzles for Vertical Thinking
- Puzzles for Horizontal Thinking

Productivity and Decision Making

1. Art of being Super Productive

- Start with Why to make objectives clear
- Thinking Limitless
- The magic of compounding returns
- Deciding what to work on
- Time Management Skills
- Measuring what matters
- Choosing wisely habits to inculcate

2. Effective Decision Making

- Why is decision making a key skill?
- Components of Decision Making
- Understanding common biases
- Letting emotions not clutter decision making
- Difference between quick decision making & slow decision making

Professional Communication

1. Reading comprehension & Short writing

- Building vocabulary
- Extracting insights from the textual information
- Drawing inferences from multiple stories
- Writing your inferences for others to understand

2. Book Reading & Writing Reviews

- Reading 10 books during the entire course & writing book reviews
- 2 Biographies
- 2 Fictions
- 6 Non-Fictions

3. Effective Understanding & Articulation

- Watching 20 movies from our suggested list
- Writing 1000 words essay on those movies
- Writing a summary of the movies

4. Group Discussion for decision making

- Understanding why GD is so important in personal & professional life
- The objective of GD - Collectively making the right decision
- 5 GD on various topics

5. Writing Professional chat/E-mail

- Writing as the most common method of professional communication
- Factors to keep in mind before starting to write
- Points to consider while writing
- Activities after writing
- Difference between chat writing & email writing

6. Making Impressive Presentation

- Why making a presentation is a professional job
- The objective of the presentation
- Attributes of good presentation
- Why research is key to the presentation
- Making a presentation interactive
- Doing 10 video/live presentation

Computer Fundamentals

1. Operating System Concepts

- Operating System Architecture
- Processes and Process Management
- Threads and Concurrency control
- Scheduling
- Memory Management
- Inter-Process Communication
- Synchronization Constructs
- I/O Management
- Resource Virtualization
- Remote Services
- Distributed Systems
- Introduction to Data Center Technologies

2. Linux Administration

- Introduction to Linux Operating Systems
- Basic Linux Commands
- File Management and Security
- The directory structure of Unix
- User Management
- Groups
- Shell types and basic commands
- Permissions
- sudo
- Systemd Services Start and Stop
- Resource Mgmt with systemctl
- Process Management (top, ps)
- Package Management(yum, apt, rpm)
- Managing disks (lsblk, df, mount, umount,du)
- File systems

3. Data Structures and Algorithms

- Built-in Data Type
 - Integers
 - Boolean
 - Floating
 - Character and Strings
- Derived Data Type

- List
- Array
- Stack
- Queue
- Linked List
 - Singly Linked List
 - Doubly Linked List
 - Circular Linked List
- Array
- Stack
- Queue
- Tree
- Basic Operations
 - Traversing
 - Searching
 - Sorting
 - Hashing
 - Insertion
 - Deletion
 - Merging
- Searching techniques
 - Binary search
 - Linear search
- Recursion
- Fibonacci series
- Sorting Algorithm
 - Bubble sort
 - Insertion sort
 - Selection sort
 - Quick sort
 - Merge sort
 - Bucket sort

4. Database concepts

- Introduction to Databases
- Entity Relationship Model
- Relational Model
- Relational Algebra
- Normalization
- Transactions and Concurrency Control
- DBMS Architecture 2-level 3-level
- Data Abstraction and Data Independence
- Database Objects

- Entity-Relationship Model
- Generalization
- Specialization
- Aggregation
- Entity Relationship Diagrams
- Keys in Relational Model
- Candidate key,
- Super key
- Primary key
- Alternate key
- Foreign key
- Strategies for Schema design
- Schema Integration
- Data modelling
- Star Schema in Data Warehouse modelling
- Data Warehouse Modeling

5. Basic SQL - Syntax

- Data Types
- Operators
- Expressions
- Create Database
- Drop Database
- Select Queries
- Create Table
- Drop Table
- Other Table Operations
- Insert Query
- Where Clause
- AND & OR Clauses
- Update operations
- Delete operations
- Order By clause
- Group By Clause
- Sorting operations
- SQL Constraints
- Type of Joins
- Unions Clause
- NULL Values
- Indexing
- Views

6. Software Engineering

- Software Engineering Overview
- Features of Good Software:
 - Operational Features
 - Transitional Features
 - Maintenance Features
- Software Development:
 - Requirement Gathering
 - Software Design
 - Programming
- Software Design
 - Design
 - Maintenance
 - Programming
- Programming:
 - Coding
 - Testing
 - Integration
- Software Development Life Cycle
 - Requirement Gathering
 - System Analysis
 - Software Design
 - Coding
 - Testing
 - Integration
 - Deployment
 - Operation and Maintenance
- Types of SDLC
 - Waterfall model
 - Iterative Model
 - Spiral model
 - V Model
- Agile Concepts
- DevOps Concepts
- Microservices Architecture
- Features of Microservices Architecture
- Software Requirements
- Software Design Basics
- Analysis & Design Tools
 - Data Flow Diagram
 - Flow Chart
- Design Strategies

- Function-Oriented Design
 - Object-Oriented Design
- User Interface Design
 - Command Line Interface(CLI)
 - Graphical User Interface (GUI)
- Design Complexity
- Software Testing Overview
 - Manual Vs Automated Testing
 - Testing Approaches
 - Black-box testing
 - White-box testing
 - Unit Testing
 - Integration Testing
 - Functionality testing
 - Acceptance Testing
 - Regression Testing
- Quality Control
- Deployment Methods
 - Blue-Green Deployment
 - Rolling Deployment
- Software Monitoring
- Software Maintenance

7. Tools

- Git
 - What is Git?
 - Installing Git
 - First-Time Git Setup
 - Git Basics
 - Getting a Git Repository
 - Recording Changes to the Repository
 - Viewing the Commit History
 - Undoing Things
 - Working with Remotes
 - Tagging
 - Git Branching
 - Basic Branching and Merging
 - Branch Management
 - Branching Workflows
 - Remote Branches
 - Rebasing
- Putty

- Installation
- Types of connections
- Connecting to a remote server
- Using Auth keys
- Customizing putty
- Vim
 - Vim Basics
 - Insert Mode
 - Visual Mode
 - Command Mode
 - Create and Edit a file
 - Search and replace in Vim
 - Vim diff
 - Copy operations
 - .vimrc file
 - Vim Commands