

FRONT END COURSE CONTENT

Front-end developer

Workshop Details:

Duration:	130 Hours
Description:	Front-end web developer
Objectives:	This course helps participants to become a front-end developer.
Participants' Entry Profile:	Participants attending this course must have development experience on: ■ Basic knowledge of HTML and JavaScript
Training Methodology:	The workshop will follow Synergetics methodology of ■ Concept Visualization ■ Active Experimentation ■ Application Development The workshop will be 100% Hands-On with each participant having access to system during the session

Setup Requirements:

Hardware and Software Requirements:	Participant's as well as Trainer's Machine are required to have: Hardware ■ Intel Pentium 4 [2+ GHz recommended] ■ 8 GB RAM ■ 50 GB HDD space ■ LAN connectivity ■ Good Internet connectivity and bandwidth Software [Installed] ■ Windows 10 ■ NodeJS 16.x ■ Postman REST client ■ Visual Studio Code ■ Chrome, Firefox and Internet Explorer
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Training Lab Requirements:	Whiteboard 6 feet by 4 feet (minimum) Whiteboard markers – Red, Blue, Green, Black Video Projector (1024 X 768 resolutions)
Virtual Lab Requirements: [Optional]	Virtual labs can be provided for participants, that provides completely configured platform to work with.

Course Contents:

Day 1

Overview of HTML 5

- The State of Browser Support
 - Browsers in Desktop & Mobile
 - Feature Detection
- Support for Legacy Browsers
 - Graceful Degradation
 - Emulation
- Developer Tools

Structure of Web Page

- HTML5 DOCTYPE
- Page Encoding
- HTML5 Mark-up
 - New and Updated Elements
 - Structural Elements
 - New Attributes
 - Deprecated Elements and Attributes
- HTML5 and CSS3 together
- Browser Support

HTML 5 Forms

- Current Solutions
- New Input Types – email, date, time, url, number, range, color and more
- New form Attributes – novalidate, formaction, formmethod
- Form Validation attributes
- Browser Support

Using new Audio and Video elements

- The State of Web Audio and Video Based on Plugins

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- New Audio/Video Mark up
- Attributes and Methods
- Understanding Audio/Video Events

Day 2

Styling web pages using CSS3

- Selective Styling
- Working with Pseudo-classes
- Working with Pseudo-elements

Working with Text, Color, Background and Table

- HTML5 Text formatting Tags
- CSS3 Font and Text properties
- CSS3 Color and Background properties
- CSS3 List and Table properties

Layout your Webpages

- CSS3 Box properties
- CSS3 display, float, margin, position properties
- Multi column layout

Visual Formatting, Transformation and Transition Properties

- Stacking objects
- Using shadow and Opaque properties
- Transforming an Element
- Adding Transitions Between Element States

Day 3

JavaScript fundamentals

- Data types and variables
- Arrays in JavaScript
- Operators
- Loops and conditions in JavaScript
- Alert, Prompt and Confirm Boxes
- Objects in JavaScript

Functions in JavaScript

- Built-in Functions
 - o Conversion functions – parseInt, parseFloat

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- o Arithmetic functions
 - o String functions
 - o Date functions
 - o Array functions
- User-defined functions
 - o Assigning functions to variables
 - o Passing parameters to functions
 - o Returning values from functions
 - o Optional parameters in JavaScript functions
- Strict mode in JS

Handling Events

- Calling methods in events

ES6 Fundamentals

- New Features
- Promises
- Maps, Sets and Weak Maps
- Generics
- Async and await
- Internationalization and localization

Day 4

Classes and functions in ES6

- Object oriented features in JS
- Classes definitions
- Constructor and Property methods (get, set)
- Static and non-static methods
- Object Initializer Shorthand
- Class definition and name

jQuery Basics

- What is jQuery?
- Benefits of jQuery
- Downloading and use jQuery
- Syntax overview
- Understanding jQuery chaining
- Anatomy of a jQuery Script
- Using basic jQuery filters
- Using basic jQuery attribute filters
- Child, content and visibility filters

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- Traversing document content
- Setting CSS Properties
- Adding CSS classes

jQuery Functions

- Modifying HTML content
 - o text() method
 - o hml() method
- Handling events
 - o click(), keyup(), keypress()
 - o on() method
- Creating, Setting and Getting Content
- Manipulation of Attributes
- Inserting Content
- Working with CSS Information

Day 5

Containers, Grid, FlexBox and Spacing

- Container and Fluid containers
- Using the Grid System
- Multiple Grid options
- Offsets and Rows
- FlexBox
- Vertical and horizontal alignment
- No gutters
- Setting space for items

Bootstrap 4 common metaphor

- Background and text
- Typography
- Setting width
- Float options
- Buttons
- Icons
- Forms

Bootstrap 4 common metaphor

- Navs and NavBars
- Images

- Tables

Day 6

Introduction to TypeScript

- Why TypeScript?
- Getting Started with TypeScript
- TypeScript Playground
- Installing and configuring TypeScript
- Tsconfig.json

TypeScript Fundamentals

- Basic data Types
- Type assertions
- Scoped and global variables
- Octal and binary literals
- Functions
- Optional, Default & Rest Parameters
- For...of statement
- Destructuring assignment
- Dotted property for types

Classes and Interfaces

- Classes in TypeScript
- Inheritance
- Accessors
- Static Property
- Constructors
- Interfaces
- Function Overload
- keyof and Lookup Types
- Partial, Readonly, Record, and Pick
- Object Spread and Rest

Modules and namespaces

- What is Module?
- Creating modules
- Import and export
- Default exports
- Ambient declarations
- Namespaces
 - Splitting across files

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- Resolving modules
- decorators
- Declaration file (.d.ts)

Day 7

Introduction

- What is Node.js?
- Node JS components
- Architecture of Node JS
- Node JS in Modern Web Apps
- Features and benefits
- Installing and configuring Node JS
 - o Installation on Windows
 - o Installation on the Mac
 - o Installation on Linux
- Running Node and NPM
- Understanding the NPM
 - o NPM repository
- Node Server
 - o Single Threaded event loop vs Multi-Threaded Request Response

Node basics

- Functions and Objects
- Object prototype and inheritance
- Scope of objects
- Errors and Exception handling
- Node.js Globals

Asynchronous Programming

- Function callbacks
 - o Success and error callbacks
 - o Callbacks with error and data
- ES6 Arrow methods
- Handling exceptions in Asynchronous Functions
- Scope and identity of 'this' keyword
- Synchronous Function Calls

Modules

- Modules in Node JS
- Exporting modules
 - o Exporting constants

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- o Exporting functions
 - o Exporting objects
- Importing modules
 - o Use of require
 - o Caching
 - o Handling cyclic dependency
- Custom modules
 - o Publishing to NPM
 - o Updating modules with new version
 - o Installing modules

Day 8

Node Modules

- Synchronous vs. asynchronous I/O
- Path and directory operations
- __dirname and __filename
- Colored messages on console
- Asynchronous file reads and writes
 - o Serving Static Content with Streams
 - o readFile and WriteFile
 - o readFileSync and WriteFileSync
 - o read and write
 - o readSync and writeSync
 - o getting file information using stat()

Writing Applications

- Building an HTTP server
- Serving static content
- Rendering a response
- Processing query strings
- Serving JSON data
- Asynchronous Loops
- Accessing GET parameters
- Receiving JSON POST Data
- Receiving Form POST Data

Day 9

Multiple processes in Node.JS

- Understanding EventEmitter
 - o Creating custom events

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- Multiple child_processes
 - o Child_process.exec()
 - o Child_process.execFile()
 - o Child_process.spawn()
 - o Child_process.fork()
- Communicating with parent and child processes

Scaling Node.js Applications

- Taking Advantage of Multiple Cores
- Scaling Across Machines
- Scaling Using nginx

Deployment and Development

- Understanding Node.js Deployment
- Multiprocessor Deployment: Using a Proxy
- Multiple Servers and Sessions

Day 10

React JS Basics

- React for Web Developers
- How React works – Virtual DOM
- Limitations and advantages of React JS
- ES6 in React and Babel
- JSX in React
- HTML tags vs React Components
- Embedding Expressions in JSX
- Attributes and Children

Components

- Creating React Components
- Children Parameter
- Functional and Class components
- Composing multiple components
- Handling Events
- Controlled and Uncontrolled Components

Component Life Cycle

- Component Life Cycle Overview
- Life Cycle Methods

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- Adding Local State to a Class
- Adding Lifecycle methods to a Class
- Using State Correctly

Conditional Rendering

- Inline if with Logical && Operator
- Inline if-else with Conditional Operator
- Preventing Component from Rendering

Lists and Forms

- Rendering Multiple Components
- Basic List component and Keys
- Extracting Component with keys
- Embedding map() in JSX
- Forms in React
- Form Events
- Form Validation
- Updating the state

Day 11

Refs and DOM

- When to use Refs
- Adding Ref to a DOM element
- Adding a Ref to a class component
- Refs and Functional Components
- Problem with Refs

React Hooks

- Benefits of using Hooks
- State Hooks
- Effect Hooks
- Rules of Hooks
- Building custom hooks

Context API

- Props and state for components
- Sharing value in component hierarchy

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- Using context to share values

React Router

- Install React Router
- Routing with react-router
- Different routing mechanism
- Setting up routing and passing routing context.
- TabRouter in React
- Navigation Tabs

Consuming REST API using React JS

- Retrieving data from server
- Updating data on server
- Using Fetch API
- Using axios library

Day 12

Redux Overview

- Understanding Redux
- Reducers
- Immutable Programming and State
- Setting up and Handling Actions
- Combining Reducer Functions
- Containers
- Action and Action Creators
- Consuming actions in Reducers
- Conditional Rendering

Redux – Store

- Dispatching Actions
- Subscribing Components
- Working with Middleware
- Using Sinon to mock out stores and data

Day 13

Redux – Asynchronous Operations

- Asynchronous Actions
- Redux-Thunk

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- Redux-Saga
- Mocking out asynchronous calls for testing

Redux – Connecting to React

- React-Redux
- Connect API
- Provider API

Redux Middleware

- Controlled components Redux
 - Ajax Request with Axios
 - Promises in Redux
 - Mapping Props to a Render Helper
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Day 14

Introduction to Vue JS

- What is Vue JS
- Setting up Development Environment
- Declarative Rendering
- Conditionals and loops
- Handling user Input

Vue Instance

- Creating Vue Instance
- Data and methods
- Instance Lifecycle hooks

Template Syntax

- Interpolations
- Directives
- Short-hands
- Computed Property and Watchers

Class and Style bindings

- Binding HTML classes
 - Object Syntax
 - Array Syntax
- Inline Styles
 - AutoPrefixing

Multiple Value

Rendering

- Conditional Rendering
 - v-if
 - v-else
 - v-else-if
 - v-show
 - v-if with v-for
- List Rendering
 - V-for with an object
 - Key
 - Array change detection
 - Sorting and filtering
 - V-for on template

Event Handling

- Listening to Events
- Event Modifiers
- Key modifiers

Day 15

Form Input Bindings

- Sort a view
- Basic form Control Binding
- Value bindings
- Modifiers

Components

- Basics of Components
- Reusing Component
- Organizing Component
- Component Registration
- Passing data to Child using Props
- Proptypes
- Passing Static or dynamic Props
- Sending messages to Parents with Events
- Dynamic Components
- Custom Event

Slots

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- Slot Content
- Default Slot Content
- Compilation Scope
- Scoped Slots

Directives

- Understanding Directives
- How Directives Work
- Passing values and Arguments to Custom Directives
- Modifying Custom Directives with Modifier
- Using Multiple Modifiers

Filters

- Local Filter
- Global Filter

Day 16

Connecting to Servers via Http

- Using Vue-Resource
- Configuring Vue-Resource
- Intercepting Requests
- Performing GET,PUT,POST,DELETE in Vue
- Using Axios instead of Vue-Resource

Routing in Vue JS Application

- Setting up Vue JS Router
- Understanding Router modes
- Setting up and Loading Routes
- Navigating with Router Links
- Navigating with code
- Setting up Router Parameters
- Fetching and using Route Parameters
- Reacting to changes in Route Parameters
- Setting up Child Routes
- Dynamic Router Links
- Query Parameters

State Management with Vuex

- Why Vuex needed
- Understanding Centralized State
- Using Getters
- Mapping Getters to Properties

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- Understanding and using mutations
- How actions improves mutations
- Mapping actions to methods
- Two way data binding