



React JavaScript Programming

Course ID #: 1260-706-ZZ-W

Hours: 14

Course Content

Course Description:

This React Training class introduces the React JavaScript framework, sometimes referred to as ReactJS or React.JS.

This React Training class will introduce the benefits of the React JavaScript framework, so participants in this React Training course can start to develop applications quickly using the framework.

At Course Completion:

After completing this course, student will be able to:

- Understand the programming model provided by the React framework
- Define React components
- Use the React framework to handle events and stateful data

Prerequisites:

Attendees for this React Training course should have some prior understanding of web development, HTML, AJAX, JavaScript and ES6 or higher.

Topics:

Chapter 1. React Overview

- What is React?
- What's in a Name?
- React Component Model
- What React Is Not
- What You Will Not Find in React
- Motivation for Creating React
- A React JavaScript Example
- One-Way Data Flow
- JSX
- A JSX Example
- The Virtual (Mock) DOM
- Only Sub-components that Actually Change are Re-Rendered
- React Libraries
- Summary



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Chapter 2. ES6 in a Nutshell

- What is ES6?
- ES6 Features
- Using ES6
- Transpiling
- Major Syntax Changes
- let and const
- Variable Scope
- Shadowing Variables
- Arrow Functions
- Arrow Functions As Parameters
- Using 'this' Within Arrow Functions
- Template Literals
- Spread Operator
- ES6 Classes
- Declaring Classes
- Declaring Instance Methods
- Accessor Methods
- Static Methods
- Inheritance With Classes
- Summary

Chapter 3. Babel Command-Line Interface

- Babel Transpiler
- Usage Options
- Presets and Plug-ins
- Babel CLI Installation
- Babel Configuration
- Running Babel Command-Line
- A Basic ES6 Development Setup with Babel
- Test the Babel Development Setup
- Adding React to the Development Setup
- Create a Minimal React App – Index.html
- Create a Minimal React App – app.js
- Summary

Chapter 4. Basic Components and JSX

- What is JSX?
- JSX Transpilation to React Code Example
- Running the Transpiled Code
- Babel
- The Babel Runtime JavaScript Library
- Script Import Skeleton Code
- Playing Around in CodePen
- React Components
- Ways to Create UI Components
- Creating a Functional Component Example
- Component Names Must Be Capitalized
- Creating a React Class-Based Component in ES5
- The render Method
- Creating a UI Component Using ES6 Class Notation
- Using ES6 Classes with React
- Which UI Component Creation Syntax Should I Use?
- Components vs Elements
- Elements Are Immutable
- Properties
- Property Naming Convention
- Properties Default to 'True'
- Spread Attributes (an ES6 Feature)
- Expressions
- Fragments
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Chapter 5. React Functional Component Concepts

- Functional Components
- Nesting JSX Elements
- Example of JSX Nesting
- Comments in JSX Code
- Setting CSS Styles Using Classes
- Setting CSS Styles Directly
- JSX Escapes Values
- Working with Lists of Items
- Keys in Lists
- Example List With Key
- Container vs. Presentational Components
- State
- Types of State Data
- State Hierarchy
- Lifting State Up
- Props vs. State
- Pass Down a Function
- Immutability
- Immutability – Why?
- Virtual DOM and State
- Setting state
- Updating Input fields
- Passing Props to Components
- Passing Functions to Components
- Event Handling
- Event Handler Example
- Event Binding – DOs
- Event Binding – Don'ts
- Passing Parameters to Event Handlers
- Component Life-cycle
- Life-cycle in Functional Components
- App Development Workflow – 1/3
- App Development Workflow – 2/3
- App Development Workflow – 3/3
- Summary

Chapter 6. React Components with ES6 Classes

- Classes in ES6
- Functional Components
- Extending React.Component
- The render() Method
- state
- props
- defaultProps
- propTypes
- Component Lifecycle
- Component Life-cycle: Overview
- Component Life-cycle – Render Phase
- Component Life cycle – Commit Phase
- Component Life-cycle – Unmounting
- constructor()
- example
- componentDidMount()
- example
- setState(newStateValue)
- Summary

Chapter 7. React Router

- Routing and Navigation
- react-router
- Creating a react-router based project
- A Basic Routed Component
- Router vs. BrowserRouter
- The Route component
- <Switch>
- Redirect Route
- Navigating with <Link>
- Navigating with <NavLink>
- Route Parameters
- Retrieving Route Parameters
- QueryString Parameters
- Using Router with Redux
- Summary



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Chapter 8. State Management for React

- React State Basics – Props and State
- Props
- State in Class Based Components
- Managing State with Hooks in Functional Components
- The Problem with Props and State
- Redux State Library
- Redux Advantages
- Redux Disadvantages
- Basic Rules for State Management
- Types of State
- Data State
- Communication State
- Control State
- Session State
- Location State
- Location State Side Effects
- Summary

Chapter 9. Using React Hooks

- Functional Component Shortcomings
- Hooks Overview
- Functional Component Props
- The useState Hook
- Functional Component using the useState hook
- useState with Multiple Variables
- useState can also be used with Objects
- The Effect Hook
- Effect Hook Example
- Using Effect Hook to Load Data
- Restricting when useEffect is Called
- Hook Rules
- Linter Example
- Custom Hooks
- Custom Hook Function Example
- Using the Custom Hook
- Additional Hooks
- Summary

Chapter 10. Unit Testing React with React Testing Library

- React Testing Framework
- Features
- Snapshot Testing
- Code Coverage
- Interactive Mode
- Projects created with create-react-app
- Default App Component Test
- Unit Tests
- Anatomy of a Unit Test
- Common Matchers
- Combining Tests
- Running Tests
- Testing Promise based async code with 'done'
- Setup and Teardown
- react-testing-library
- A Simple Component Test
- A Simple Snapshot Test
- Running and Updating Snapshot Tests
- Building Component Tests
- Calling Render
- Render Properties
- Simulating Events
- Testing Results
- Using Query Functions
- Text Matching
- Counter Component
- counter-test.js
- Summary



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Lab Exercises

- Lab 1. Setting Up a React Development Environment
- Lab 2. Basic React Components
- Lab 3. More React Component Concepts
- Lab 4. ES6 React Components
- Lab 5. React Router Application
- Lab 6. React Hooks Application
- Lab 7. Course Project – React App Using Hooks