



React Fundamentals

Course #: RA-510 **Duration:** 5 days

Prerequisites

Students should have a good understanding of HTML and CSS and be experienced JavaScript developers, with an advanced understanding of JavaScript objects and functions as first class citizens.

Details

React is a JavaScript library for building interactive user interfaces. It can be incrementally adopted, scaling easily from being used as a library to add small functionality to web pages to being used as a framework for a complete single-page-application. React also provides hooks that allow easy interaction with other JavaScript libraries and frameworks.

This course will give the student a solid and in-depth foundation for building applications that use the powerful features provided by React.

Software Needed

- Node.js installed
- Any text editor (we recommend Visual Studio Code: <https://code.visualstudio.com/>)
- At least one web browser (Google Chrome is recommended)
- Internet connection

Outline

- **Introduction**
 - What is React
 - Why use React?
 - SPAs and React Web Apps
 - NextGen JavaScript Features
- **React Syntax and Basics**
 - Using Create React App
 - Component Basics
 - JSX
 - Props and Dynamic Content
 - State and Event Handling
 - Two-Way Binding
- **Dynamic Content**
 - Conditionally Rendering Content
 - Collection Content
 - Updating State Immutably
 - Collections and Keys
 - More Flexible Collections

- **Styling Content**
 - Inline Styles
 - Dynamically Setting Styles
 - Dynamically Setting Class Names
 - Using Radium
 - Using CSS Modules
- **Debugging**
 - Understanding Error Messages
 - DevTools and Sourcemaps
 - React Developer Tools
 - Error Boundaries
- **Components**
 - Creating Components
 - Stateless vs. Stateful
 - Component Lifecycle
 - Pure Components
 - Higher-Order Components
 - Validating Props
 - Context API
- **Web Server Interactions**
 - AJAX Calls
 - Using Axios
 - Rendering Fetched Data
 - Avoiding Infinite Loops
 - POSTing Data
 - Handling Errors Locally
 - Interceptors
- **Routing**
 - Setting Up the Router Package
 - Rendering Components for Routes
 - Using Routing-Related Props
 - Absolute vs. Relative Paths
 - Nested Routes
 - Route Guards
 - Routing and Deployment
- **Forms**
 - Custom Dynamic Input Components
 - Configuring a Form
 - Handling Form Submission
 - Custom Validation
 - Showing Error Messages
- **Managing State with Redux**
 - Complexity of State Management
 - How Redux Works
 - Reducer Functions and State Store
 - Dispatching Actions
 - Creating Subscriptions
 - Connecting React to Redux
 - Dispatching Actions from Components
- **Async Redux**
 - Adding Middleware
 - Redux Devtools
 - Action Creators
 - Handling Async Actions
 - Action Creators and Get State
- **Testing**
 - Required Testing Tools
 - What to Test?
 - Testing Components
 - Jest and Enzyme

- Testing Containers
- Testing Redux
- **Transitions and Animations**
 - Using CSS Transitions
 - Using CSS Animations
 - ReactTransitionGroup
 - Using the Transition Component
 - Wrapping the Transition Component
 - Animation Timing
 - Transition Events
- **Introduction to Hooks**
 - What are React Hooks?
 - Getting Started with useState()
 - Updating State
 - Multiple States
 - Rules of Hooks
 - Passing State Across Components
- **Side Effects**
 - Sending HTTP Requests
 - useEffect() and Loading Data
 - Understanding useEffect() Dependencies
 - What is useCallback()?
 - Refs and useRef()
 - Cleaning up with useEffect()
- **State Batching**
 - Understanding useReducer()
 - useReducer() and HTTP State
 - Working with useContext()
 - Performance Optimization with useMemo()
- **Custom Hooks**
 - Getting Started
 - Sharing Data with Components
 - Using a Custom Hook