# React Fundamentals

Duration: 3 days

## Course Overview

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.

## 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.

## Course Outline

* Introduction
  + What is React
  + Why use React?
  + SPAs and React Web Apps
  + NextGen JavaScript Features
* React and JSX
  + Using Create React App
  + Component Basics
  + JSX Syntax
  + JSX Restrictions
  + Functional Components
  + JSX Cheatsheet
  + Props and Dynamic Content
  + State and Event Handling
  + Two-Way Binding
* Dynamic Content
  + Conditionally Rendering Content
  + Collection Content
  + Collections and Keys
  + Updating State Immutably
  + 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
  + Virtual DOM and React Updates
  + Rendering Adjacent JSX Elements
  + Higher-Order Components
  + Validating Props and PropTypes
  + 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