

Introduction to React.js

- **What is React.js?**
 - Overview of JavaScript libraries and frameworks
 - History and evolution of React
 - Advantages of using React

Setting Up the Development Environment

- **Installation**
 - Installing Node.js and npm
 - Setting up a React project using Create React App
 - Understanding the project structure
- **Tools and Editors**
 - Recommended code editors (VS Code, Sublime Text, etc.)
 - Browser extensions (React Developer Tools)

JSX and Rendering Elements

- **JSX Syntax**
 - Embedding expressions in JSX
 - JSX vs. HTML
 - JSX best practices
- **Rendering Elements**
 - Rendering elements to the DOM
 - Updating the rendered elements

Components

- **Function and Class Components**
 - Creating and using function components
 - Creating and using class components
- **Props and State**
 - Passing data with props
 - Handling state in class components
 - Using useState hook in function components

Component Lifecycle

- **Lifecycle Methods in Class Components**
 - Mounting, updating, and unmounting phases
 - Common lifecycle methods (componentDidMount, shouldComponentUpdate, etc.)
- **Hooks for Function Components**
 - useEffect for side effects
 - Custom hooks

Handling Events

- **Event Handling in React**
 - Handling events in function components
 - Binding event handlers in class components

- **Synthetic Events**
 - Understanding React's synthetic event system

Conditional Rendering

- **Rendering based on Conditions**
 - Using if-else statements
 - Conditional operators
 - Ternary operators
 - Switch-case statements

Lists and Keys

- **Rendering Lists**
 - Mapping over lists to render components
 - Using keys for list elements

Forms and Controlled Components

- **Working with Forms**
 - Controlled vs. uncontrolled components
 - Handling form submissions
 - Validating form inputs

State Management

- **Lifting State Up**
 - Sharing state between components
- **Context API**
 - Creating and using context
 - Context consumer and provider
- **Redux (optional)**
 - Introduction to Redux
 - Setting up Redux in a React project
 - Actions, reducers, and store
 - Connecting React components to Redux

Routing

- **React Router**
 - Setting up React Router
 - Route, Link, and NavLink components
 - Nested routes
 - URL parameters and query strings

Advanced Topics

- **Higher-Order Components (HOCs)**
 - Understanding HOCs
 - Creating and using HOCs
- **Render Props**
 - Using render props for component logic
- **Portals**

- Creating and using portals for rendering outside the DOM hierarchy
- **Error Boundaries**
 - Catching and handling errors in components

Performance Optimization

- **Optimizing React Apps**
 - React memoization
 - Code splitting with React.lazy and Suspense
 - Using React Profiler

Testing

- **Testing React Components**
 - Introduction to testing frameworks (Jest, React Testing Library)
 - Writing unit tests for components
 - Snapshot testing

Building and Deploying

- **Building React Apps**
 - Production build process
 - Analyzing the bundle size
- **Deploying React Apps**
 - Deployment options (Netlify, Vercel, GitHub Pages, etc.)
 - Setting up Continuous Integration (CI)

Practical Projects

- **Project Ideas**
 - Todo App
 - Weather App
 - E-commerce site
 - Blog platform

Resources and Further Learning

- **Official Documentation**
 - React.js official docs
- **Community and Support**
 - Stack Overflow, Reddit, GitHub issues
- **Tutorials and Courses**
 - Online platforms (Udemy, Coursera, freeCodeCamp)