React JS

Prerequisites: Knowledge of JavaScript ES6 Programming.

Day 1: Introduction to React and Basic Concepts

- What is React?
- History and evolution of React
- React ecosystem and community
- Installing Node.js and npm
- Setting up Create React App
- Overview of the project structure
- Understanding JSX syntax
- Rendering elements
- Embedding expressions in JSX
- Function and class components
- Props and PropTypes
- Composing components

Lab 1: Building Basic React Components

- Setting up a new React project
- Creating and rendering components
- Passing and validating props

Day 2: State Management and Event Handling

- State in class components
- Lifecycle methods (componentDidMount, componentDidUpdate, componentWillUnmount)
- Handling events in React
- Binding event handlers
- Synthetic events
- Conditional rendering techniques
- Inline if with logical && operator
- Conditional rendering with ternary operator
- Rendering lists in React
- Keys and their importance
- Using map() to create lists

Lab 2: State Management and Event Handling

- Creating components with state
- Implementing event handlers
- Building a dynamic list component

Day 3: Advanced React Concepts

- Controlled vs. uncontrolled components

- Handling form submissions
- Controlled input elements
- Sharing state between components
- Lifting state up to parent components
- Common state management patterns
- Introduction to Context API
- Creating and using context
- Context.Provider and Context.Consumer
- Creating and using refs
- Accessing DOM nodes
- Managing focus and media playback

Lab 3: Advanced Component Patterns

- Creating and managing forms
- Lifting state up and sharing state
- Using Context API for state management

Day 4: React Router and API Integration

- Setting up React Router
- Creating routes and links
- Nested routes and route parameters
- Programmatic navigation
- Redirecting routes
- Handling 404 pages
- Using the Fetch API and Axios
- Making GET and POST requests
- Handling loading and error states
- Introduction to React Hooks
- Using useState and useEffect
- Custom hooks for data fetching

Lab 4: Routing and Data Fetching

- Setting up and configuring React Router
- Creating dynamic routes and navigation
- Fetching and displaying data from an API

Day 5: Performance Optimization and Testing

- Avoiding unnecessary re-renders
- Memoization with React.memo and useMemo
- Optimizing large lists with react-window
- Introduction to code splitting
- Implementing lazy loading with React.lazy and Suspense

- Dynamic imports
- Introduction to testing libraries (Jest, React Testing Library)
- Writing unit tests for components
- Testing user interactions
- Building the application for production
- Setting up continuous integration (CI) with GitHub Actions
- Deploying to hosting services

Lab 5: Final Project and Deployment

- Optimizing the application for performance
- Writing and running tests for key components
- Building and deploying a React application