

# React Complete Roadmap (Basic to Advanced)

## 1. React Foundations (Basics)

- Core Concepts: What is React, JSX syntax, Functional vs Class components, Props, Children props
- State & Events: useState, event handling, controlled vs uncontrolled inputs, lifting state
- Rendering: conditional rendering, lists & keys, fragments
- Styling: inline styles, CSS Modules, styled-components, Tailwind CSS

## 2. Intermediate React

- React Hooks: useEffect, cleanup, useContext, useRef, useReducer, custom hooks
- Forms: handling input, two-way binding, validation (Formik, React Hook Form, Yup)
- Routing: React Router basics, nested routes, params, query strings, protected routes
- Component Communication: props, callbacks, context API vs prop drilling

## 3. Advanced React

- Performance Optimization: React.memo, useCallback, useMemo, lazy loading, virtualization
- Advanced Hooks: useLayoutEffect, forwardRef, useImperativeHandle, useTransition, useDeferredValue, useId
- Error Handling: error boundaries, fallback UI, async error handling
- Portals & Patterns: React Portals, compound components, render props, HOCs, controlled vs uncontrolled
- Testing: Jest, React Testing Library, mocking APIs, Cypress/Playwright

## 4. React Ecosystem

- State Management: Context API, Redux Toolkit, MobX, Zustand, Recoil, React Query
- Networking & APIs: Fetch, Axios, React Query caching/mutations, SWR
- UI Libraries: Material UI, Ant Design, Chakra UI, Tailwind
- Forms (Advanced): dynamic fields, async validation, multi-step forms, Yup/Zod validation

## 5. Expert-Level React

- React Internals: Virtual DOM, Fiber, concurrent rendering, React 18 (Suspense, batching, streaming SSR)
- SSR & SSG: Next.js, pages/app dir, SSG, SSR, ISR, server components
- Scalability & Architecture: Monorepos, micro-frontends, module federation, Atomic Design, Storybook
- Performance Deep Dive: hydration vs CSR, bundle analysis, tree shaking, React Profiler, Web Vitals
- Security: preventing XSS, sanitization, JWT/OAuth/NextAuth.js, CSRF
- Enterprise Patterns: design systems, theming, accessibility (a11y), internationalization (i18n)

## 6. Beyond React

- GraphQL with React: Apollo Client, Relay, caching strategies
- React Native: setup, navigation, native APIs, bridging
- Full-Stack with React: MERN, Next.js API routes/middleware, serverless functions
- DevOps & Deployment: CI/CD, hosting (Vercel, Netlify, AWS, Firebase), Docker, monitoring (Sentry, LogRocket)

## 7. Senior-Level & Interview Prep

- System design for React apps
- Debugging & performance troubleshooting
- Building a component library from scratch
- Implementing Redux from scratch
- Writing a mini React implementation
- Open-source contributions to React ecosystem