

Advanced Frontend Development

Duration: 5 Days

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Day 1 — Advanced React Components & Architecture

Topics:

- React architecture for large applications
- Component design patterns
- Smart vs dumb components
- Controlled vs uncontrolled components
- Compound components
- Higher-Order Components (HOC)
- Render props pattern
- Custom hooks
- Code reuse strategies
- Feature-based folder structure

Hands-on:

- Design enterprise React project structure
- Build reusable component library
- Create custom hooks

Examples:

- Modal component
- Reusable table component
- Custom hook (useFetch / useDebounce)

Day 2 — Forms & Advanced User Interaction in React

Topics:

- Controlled components
- Form state management
- Dynamic forms
- Form validation strategies
- Custom validation
- Async validation
- Handling user input
- Error handling
- Loading states
- Optimistic UI updates

Common libraries:

- React Hook Form
- Yup / Zod

Hands-on:

- Build dynamic form system
- Implement validation
- Handle form submission flow
- Implement error and loading states

Day 3 — API Integration & Modern Data Fetching in React

Topics:

- REST API integration
- Fetch / Axios usage
- Request lifecycle
- Error handling strategies
- Retry mechanism
- Pagination
- Filtering

- Searching
- Sorting
- API abstraction layer
- Data transformation

Modern data fetching:

- Redux Toolkit
- RTK Query concepts
- API caching
- Query lifecycle
- Mutations

Hands-on:

- Build API service layer
- Implement product/user listing
- Integrate API with UI
- Implement RTK Query data fetching

Day 4 — State Management & Routing in React

Topics:

- Local vs global state
- Context API
- State sharing between components
- State lifecycle
- Data synchronization
- Redux architecture
- Store configuration
- Actions and reducers
- Middleware concepts
- Routing concepts
- Navigation flow

- Protected routes
- Role-based access

State management tools:

- Redux

Hands-on:

- Implement global state management
- Configure Redux store
- Build multi-page React application
- Implement protected routes

Day 5 — Testing & Production-Ready React Architecture

Topics:

- Unit testing in React
- Component testing
- Mock services
- Test coverage
- Testing strategy
- Error boundaries
- Code organization
- Reusable module design
- Scalable React architecture
- Best practices for maintainability

Testing tools:

- Jest
- React Testing Library

Hands-on:

- Write component tests
- Design scalable React architecture
- Build production-style React application