PAYILAGAM – REACT SYLLABUS

Frontend Development Course Overview

This course is designed to provide a comprehensive foundation in HTML, CSS, JavaScript, and React through a practical, hands-on approach. Each concept is taught through mini projects to ensure real-world understanding and skill application. By the end of this course, you won't just know front-end technologies you'll have built a portfolio of mini projects to showcase your skills.

HTML Syllabus

Module 1 : HTML Elements
- Introduction to HTML syntax
- Block-level vs Inline elements
- Common elements: <div>, <span>, <p>, <a>, <img>, <br>, <hr>
- Nesting elements correctly

Outcome: Mini Project #1

Module 2 : HTML Attributes
- Global attributes: id, class, title, style, lang
- data Specific attributes: href, src, alt, type, value, placeholder
- Boolean attributes: checked, disabled, readonly, required

Outcome: Mini Project #2

Module 3 : HTML Forms
- <form> element and its attributes (action, method, etc.)
- Input fields: <input>, <textarea>, <select>, <option>, <button>
- Fieldsets, legends, and labels
- Form validation (required, pattern, minlength, maxlength)

Outcome: Mini Project #3

Module 4 : HTML Lists
- Ordered Lists: <ol>,
- Unordered Lists: <ul>,
- Description Lists: <dl>, <dt>, <dd>
- Nesting and styling lists

Outcome: Mini Project #4

Module 5 : HTML Tables
- Creating tables with <table>, <tr>, <th>, <td>
- Table structure: <thead>, <tbody>, <tfoot>
- Merging cells with colspan and rowspan
- Table accessibility and semantics

Outcome: Mini Project #5

Module 6 : Semantic HTML
- Importance of semantic elements for SEO & accessibility
- Elements: <header>, <nav>, <main>, <section>, <article>, <aside>, <footer>
- When and where to use semantic tags

Outcome: Mini Project #6

Module 7 : HTML Media
- Images: <img>, srcset, alt, picture
- Video: <video>, controls, autoplay, loop, muted

- Audio: <audio>, controls, autoplay, loop, preload
- Embedding YouTube and other media

Outcome: Mini Project #7

Module 8 : Input Types
- Text-based: text, email, password, search, url, tel
- Choice-based: checkbox, radio
- Date/time: date, datetime-local, time, month, week
- Others: file, color, range, number, hidden

Outcome: Mini Project #8

CSS Syllabus

Module 1 : CSS Selectors
- Basic selectors: element, class, ID
- Grouping and combining selectors
- Attribute selectors
- Combinators: descendant, child (>), adjacent sibling (+), general sibling (~)

Outcome: Mini Project #1

Module 2 : Box Model
- Understanding content, padding, border, and margin
- Using box-sizing: border-box
- Visualizing box dimensions with dev tools
- Margin collapsing

Outcome: Mini Project #2

Module 3 : Display Property
- block, inline, inline-block, none
- flex
- grid
- visibility: hidden vs display: none

Outcome: Mini Project #3

Module 4 : Positioning
- Static, Relative, Absolute, Fixed, Sticky
- Using top, right, bottom, left with positioning
- Z-index and stacking context

Outcome: Mini Project #4

Module 5 : Flexbox
- Introduction to display: flex
- Main axis vs cross axis
- Properties: justify-content, align-items, align-content, flex-wrap
- Flex item properties: flex, flex-grow, flex-shrink, flex-basis, order

Outcome: Mini Project #5

Module 6 : CSS Grid
- Introduction to grid layout
- Creating columns and rows using grid-template-columns and grid-template-rows
- Placing items with grid-column, grid-row
- Grid gap, alignment, and nested grids

Outcome: Mini Project #6

Module 7 : Pseudo-classes & Pseudo-elements
- Pseudo-classes: :hover, :focus, :nth-child(), :last-child
- Pseudo-elements: ::before, ::after, ::first-letter, ::first-line
- Styling interactive elements with hover/focus states

Outcome: Mini Project #7

Module 8 : Transitions & Animations
- CSS Transitions: transition, transition-delay, transition-timing-function
- CSS Animations: @keyframes, animation-name, animation-duration
- Creating hover animations and simple motion effects

Outcome: Mini Project #8

Module 9 : Responsive Design (Media Queries)
- Introduction to responsive design and mobile-first approach
- Media queries: syntax and breakpoints
- Responsive typography and layout adjustments
- Responsive navigation and images

Outcome: Mini Project #9

JavaScript Syllabus

Module 1 : Variables & Data Types
- Understand var, let, and const when and why to use each
- Explore JavaScript's powerful dynamic typing system
- Work with strings, numbers, booleans, null, undefined, and more

Module 2 : Operators & Logic
- Arithmetic, assignment, comparison, and logical operators
- Master the building blocks of computation and condition

Module 3 : Conditionals & Control Flow
- Decision-making with if, else, else if, and switch
- Write clean, readable branching logic

Module 4 : Loops & Iteration
- for, while, and do...while loops
- Introduction to forEach() for working with arrays

Module 5 : Functions
- Function declarations vs expressions
- Arrow functions: cleaner syntax, smarter scopes
- Parameters, return values, and function composition

Module 6 : Objects & Arrays
- Create and manipulate object literals
- Understand this in different contexts
- Work with arrays: push, pop, shift, unshift, splice
- Use powerful array methods: map(), filter(), reduce() for real-world data tasks

Module 7 : Access & Modify HTML Elements
- Use document.getElementById, querySelector, and more
- Change text, classes, styles, and attributes dynamically

Module 8 : Events & Interaction
- Add interactivity with addEventListener()
- Handle clicks, inputs, mouse events

Module 9 : Create & Remove Elements
- Build and destroy DOM elements on the fly
- Dynamically update content based on user interaction or data

Module 10 : Callbacks, Promises, and Async/Await
- Understand synchronous vs asynchronous execution
- Master callbacks: the core of async logic
- Use Promises to write cleaner asynchronous code
- async/await for readable, elegant data workflows

Module 11 : Fetch API & External Data
- Send HTTP requests and handle JSON responses
- Build real-world features like weather apps, search bars, and more
- Error handling and loading states

React Syllabus

Module 1 : React Fundamentals
- What is React? Why React?
- SPA vs MPA
- Setup using Vite or Create React App
- JSX syntax and rules
- Functional Components
- Props and Component Reusability
- Conditional rendering
- Lists and keys

Module 2 : State Management with Hooks
- useState hook
- useEffect hook: side effects and cleanup
- useRef for DOM manipulation
- useContext for simple state sharing
- State lifting
- Form handling with controlled components

Outcome: Mini Project #1

Module 3 : React Router (v6+)
- BrowserRouter, Routes, Route
- Link and NavLink
- Nested routing
- Dynamic routing with URL params
- useNavigate and programmatic routing

Outcome: Mini Project #2

Module 4 : Working with APIs
- HTTP methods and REST principles
- Using fetch and Axios
- API calls with useEffect
- Handling loading, error, and empty states
- Search and filtering from API data

Outcome: Mini Project #3

Module 5 : Advanced Hooks
- useReducer for complex state management
- useMemo and useCallback for optimization
- Custom hooks
- Debouncing and throttling with hooks

Outcome: Mini Project #4

Module 6 : Global State Management
- Understanding prop drilling
- Context API with custom hooks
- Redux Toolkit: Slices, store, useDispatch/useSelector, Async thunks
- React Query / TanStack Query (Bonus)

Outcome: Mini Project #5

Module 7 : Styling in React
- CSS Modules
- Tailwind CSS
- Styled-components
- Responsive design strategies

Outcome: Mini Project #6

Module 8 : Code Optimization & Best Practices
- Component reusability
- React.memo and pure components
- Lazy loading and code splitting using React.lazy and Suspense
- Error boundaries
- Folder structure and naming conventions

Outcome: Mini Project #7

Module 9 : Testing
- Introduction to Testing
- Unit testing with Jest
- Component testing using React Testing Library
- Mocking API calls in tests

Outcome: Mini Project #8

Module 10 : Deployment & DevOps Basics
- Building React apps for production
- Hosting on Netlify, Vercel, or GitHub Pages
- Using environment variables (.env)
- Introduction to CI/CD using GitHub Actions

Outcome: Ecommerce Project #7