

React with Flask

Module 1: Modern Web Development Fundamentals

- Client- Server Architecture and APIs
- Front End vs Backend Development
- Role of Python and Flask in Web Application Development
- SQL vs NO-SQL database
- Modern Web Application Development (Using JS Frameworks)

Module 2: JavaScript Environment Setup

- Installation of Python and Virtual Environments
- Installation of Node JS and overview of npm
- Create Local JS project

Module 3: JavaScript ES6 Fundamentals

- Introduction to ES6 JavaScript
- `let` and `const` Declarations
- Block and Function Scoping
- Arrow Functions and Lexical This
- Simplified Function Declarations
- Maintaining Correct 'this' Context
- Extracting Values from Objects and Arrays
- Using Spread for Arrays and Objects
- Creating and Extending Classes
- Constructors, Inheritance, and Prototypes
- Handling Asynchronous Operations with Promises
- Chaining and Error Handling
- Organizing Code into Modules
- Importing and Exporting Modules

Demo: Demo related to each topic

Module 4: Interactive Front-End Development using React JS

- An overview on React
- Virtual DOM vs Real DOM
- Class Components vs Functional Components
- Importance of State in React Application (Retrieve/ Add Data)

- Passing Data between components using PROPS
- Challenge with components while passing data

Lab : Create Project with Multiple components (Login, Register, View, Search components)

Module 5: Create Reusable Components

- Building UI components and Compositions
- Props and Component Reusability (HOF)
- React Hooks
- Managing State and Effects with use Effect and use Effect

Demo: Create Functional components using React hooks.

Module 6: Working with Forms

- Building Controlled Components
- Styling with Bootstrap
- Data Binding
- Event Binding
- Handling Form Submission and Validation
- Server-Side rendering
- Introduction to Axios
- Perform GET/POST operation with Web Services using Axios

Lab: Update Components with Bootstrap CSS styling

Module 7: React Router or Navigation

- Setting up Routing and Navigation
- Create Dynamic Routs and Links
- Difference between Links and Hyper Links
- 404 Error Component
- Protected Routes

Lab: Update Project for Navigation, Link all Routes and create a React Application

Module 8: React Redux

- Challenge in State Management in traditional style
- An overview of Redux
- Setup Redux Store and Reducers
- Define Actions and reducers for State Updates
- Connecting Redux store to Components
- Dispatch Action to update State

Lab: Implement Redux Store for Passing Data internally between components

Module 9: Database Design with MongoDB

- SQL vs NO-SQL database
- Setup of Mongo DB Locally and Cloud Access
- Data Modelling and CRUD Operation
- Perform Queries with Mongo DB
- Create Indexes for Query Optimization

Module 10: Introduction to Backend Development and REST Architecture

- Basics of Backend Logic and RESTful Principles
- Installing Flask and Creating an App
- Creating and Testing Your First API Endpoint
- Defining Routes and Handling HTTP Methods
- Parsing Request Data with Flask
- Input Validation and Error Handling
- Using Marshmallow for Serialization
- Understanding JWT Authentication Flow
- Implementing JWT Authentication with Flask-JWT-Extended
- Implementing Cross-Origin Resource Sharing (CORS)
- Custom Error Handling Responses

Assignment

Integrate REST API with React Application

Perform CRUD Operation and Visualization