INT219:FRONT END WEB DEVELOPER

L:2 T:0 P:2 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: understand HTML5 structure and CSS3 principles for responsive web design

CO2 :: apply JavaScript fundamentals to create interactive web pages

CO3 :: analyze advanced JavaScript concepts and asynchronous behavior.

CO4 :: apply the DOM using events, debugging tools, and modern tooling

CO5 :: apply TypeScript features for type-safe web development

CO6 :: analyze code quality using TypeScript, testing, and version control

Unit I

HTML5 and CSS3 Foundations : HTML document structure, Semantic HTML elements, Forms and input controls, Multimedia elements, CSS fundamentals, Selectors and specificity, Box model, Positioning and display properties, Flexbox and Grid basics, Responsive design principles, Introduction to modern CSS workflows, Version control fundamentals using Git and GitHub

Unit II

JavaScript Programming Fundamentals : JavaScript syntax and data types, Variables and scope, Operators and expressions, Control flow statements, Functions and arrow functions, Arrays and objects, Basic event handling, Introduction to browser interaction

Unit III

Advanced JavaScript and Asynchronous Programming : Execution context and scope chain, Closures, Prototype and prototype chain, Event loop and concurrency model, Promises and asynchronous control flow, Microtask and macrotask queues, ES6+ language features, JavaScript modules

Unit IV

DOM Manipulation and Modern Tooling : Document Object Model (DOM) structure, DOM traversal and manipulation, Dynamic styling and content updates, Event propagation and delegation, Debugging using browser developer tools, Module bundling concepts using modern build tools, Code linting and formatting practices

Unit V

TypeScript Fundamentals : Introduction to TypeScript, Type system and annotations, Interfaces and type aliases, Union and intersection types, Generics, Type inference and narrowing, TypeScript compilation workflow

Unit VI

TypeScript for Web Applications and Quality Assurance : Type-safe data models, Component and API typing strategies, Integration of TypeScript in frontend projects, Static code analysis, Debugging workflows, Testing fundamentals, Code quality and maintainability practices

List of Practicals / Experiments:

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- Create an HTML5 web page using semantic elements and basic CSS for layout and typography.
- Design a user registration form using HTML input controls and apply CSS selectors, box model, and focus styles.
- Build a responsive web page using Flexbox for navigation, Grid for content layout, and media queries.
- Write JavaScript programs demonstrating variables, data types, operators, and control flow statements.
- Implement JavaScript functions (normal and arrow) and perform operations on arrays and objects.
- Handle user events such as clicks and input changes to dynamically update web page content using JavaScript.
- Demonstrate JavaScript execution context, scope, and closures using nested functions.

- Implement prototype-based inheritance and apply ES6 features such as let, const, spread, and destructuring.
- Use setTimeout, Promises, and async/await to demonstrate asynchronous execution and the event loop.
- Perform DOM traversal and manipulation to dynamically add, remove, and update HTML elements.
- Implement event delegation for dynamic elements and debug the application using browser developer tools.
- Write TypeScript programs using type annotations, interfaces, type aliases, and union types.
- Implement generic functions and demonstrate type inference and type narrowing in TypeScript.
- Integrate TypeScript into a frontend project, compile TypeScript to JavaScript, and apply basic code quality practices.

Text Books:

1. MASTERING HTML, CSS & JAVA SCRIPT WEB PUBLISHING by LAURA LE MAY, RAFE COLBURN, JENNIFER KYRNIN, BPB PUBLICATIONS

References:

1. LEARNING TYPESCRIPT by JOSH GOLDBERG, SHROFF/O'REILLY