Modern Front-End Web Development

(HTML5, CSS3, JavaScript, Tools, and Web APIs for new web developers)

Version 3.0.0

Course Description

This course introduces new front-end web developers to the modern tools, technologies, and best practices used to build professional, standards-based websites and web applications. Students will gain hands-on experience with the three pillars of front-end development—HTML5, CSS3, and JavaScript—while learning how to use modern development environments, package managers, build tools, and browser APIs.

Through practical labs and guided exercises, students will build interactive web pages, explore responsive design techniques, and connect to APIs using AJAX and Fetch. The course also provides an introduction to popular libraries and frameworks, giving students a sense of the current front-end landscape without overwhelming detail.

By the end of the course, students will be able to confidently create, style, and script modern web applications and understand how to collaborate effectively using version control and common developer tools.

Audience

- Junior web developers
- Developers new to front-end web development
- Professionals working with web developers who need to communicate and collaborate effectively

Prerequisites

- Comfort using a Windows or Mac computer
- Basic knowledge of programming concepts (variables, functions, loops)
- Some exposure to HTML, CSS, or JavaScript is helpful, but not required

Duration

5 days

Course Outline

Module 1: Introduction to Web Development

- Overview of the Web platform
- How the web works: protocols (HTTP, DNS, TCP/IP)
- Understanding clients, servers, and APIs
- Setting up the development environment (VSCode, Node.js, npm, Vite)
- **Lab 01:** Working with the Command Line in VSCode
- **Lab 02:** Using Visual Studio Code Basics

Module 2: Tools and Workflows

- Version control with Git (basics, workflow, branching)
- Package management with npm
- Automated builds and reproducible environments
- Browser developer tools overview
- **Lab 03:** Controlling Your Versions with Git
- **Lab 04:** Initializing npm
- **Lab 05:** Using npm
- **Lab 06:** Creating a New Project with Vite
- **Lab 07:** Using Chrome Developer Tools – Elements Panel
- **Lab 08:** Using Chrome Developer Tools – Sources Panel (JavaScript Debugging)

Module 3: HTML5 Essentials

- HTML syntax and structure
- Semantic elements and accessibility
- Forms and validation
- Common HTML5 APIs (Media, Geolocation, Canvas, Web Storage)
- **Lab 09:** Creating an HTML Form

Module 4: CSS3 and Responsive Design

- CSS syntax, selectors, and specificity
- Box model and layout fundamentals
- Positioning and Flexbox
- Responsive Web Design (RWD) concepts
- Using CSS libraries (Bootstrap, Materialize)
- **Lab 10:** Using CSS Selectors
- **Lab 11:** Positioning with CSS (and Flexbox)

Module 5: Modern JavaScript (ES6+)

- JavaScript history and role in web development
- Variables (var, let, const) and scope
- Data types, operators, and control flow
- Functions and ES6 arrow functions
- Arrays, objects, and JSON
- Modules (import/export)
- **Lab 12:** Variables, Arrays, and Constants in JavaScript
- **Lab 13:** Using Chrome DevTools – JavaScript Console
- **Lab 14:** Using JavaScript Methods
- **Lab 15:** Using JavaScript Objects

Module 6: DOM Manipulation and Events

- The Document Object Model (DOM)
- Selecting and updating elements
- Handling events
- Introduction to asynchronous code (timers, callbacks, promises)
- **Lab 16:** Performing DOM Manipulation

Module 7: Client-Side APIs and AJAX

- Fetch API for making requests
- Working with JSON data from REST APIs
- Introduction to promises and async/await

Module 8: Survey of Modern Libraries and Frameworks

- jQuery (historical perspective)
- Introduction to React and component-based development (at a high level)
- Other frameworks (Angular, Vue) overview
- Where to go next: continued learning paths
- **Lab 17:** Building a Movie Review Webpage with jQuery

Final Project

Students will build a small interactive web application that uses HTML5, CSS3, JavaScript (ES6), and a client-side API to fetch and display data. This project reinforces the full toolchain workflow (Git, npm, Vite, DevTools).