

# JavaScript Syllabus

## Week 1: Introduction to JavaScript

- **What is JavaScript?**
  - Definition and purpose
  - Brief history and evolution
  - Where JavaScript runs (browsers, servers)
- **Setting Up the Environment**
  - Writing JavaScript in the browser console
  - Embedding JavaScript in HTML (inline, internal, external)
- **Basic Syntax**
  - Statements and semicolons
  - Comments (`//`, `/* */`)
  - Variables (`var`, `let`, `const`)
- **Data Types**
  - Numbers, strings, booleans, null, undefined
  - Checking types with `typeof`

## Week 2: Operators and Control Flow

- **Operators**
  - Arithmetic operators (+, -, \*, /, %)
  - Assignment operators (=, +=, -=, etc.)
  - Comparison operators (==, ===, !=, !==, >, <, >=, <=)
  - Logical operators (&&, ||, !)
- **Control Flow**
  - Conditional statements (if, else if, else, switch)
  - Loops (for, while, do...while, for...in, for...of)
- **Practical Exercises**
  - Simple arithmetic calculations
  - Conditional logic exercises

## Week 3: Functions and Scope

- **Functions**
  - Defining functions with function keyword
  - Function expressions
  - Arrow functions (`() => {}`)
  - Parameters and return values
- **Scope**
  - Local vs. global scope
  - Block scope with `let` and `const`
  - Scope chain and closures
- **Practical Exercises**
  - Writing basic functions
  - Function scope exercises

## Week 4: Objects and Arrays

- **Objects**
  - Creating objects ({})
  - Accessing and modifying properties (dot notation, bracket notation)
  - Methods and this keyword
- **Arrays**
  - Creating arrays ([])
  - Accessing and modifying elements
  - Common array methods (push, pop, shift, unshift, slice, splice)
- **Iterating Over Objects and Arrays**
  - for...in loop for objects
  - for, for...of, forEach for arrays
- **Practical Exercises**
  - Working with objects and arrays
  - Array manipulation exercises

## **Week 5: DOM Manipulation**

- **What is the DOM?**
  - Document Object Model overview
  - Accessing the DOM with document object
- **Selecting Elements**
  - getElementById, getElementsByClassName, getElementsByTagName
  - querySelector, querySelectorAll
- **Manipulating Elements**
  - Changing content (innerText, innerHTML, textContent)
  - Modifying attributes (setAttribute, getAttribute, removeAttribute)
  - Changing styles (style property, CSS classes)
- **Event Handling**
  - Adding event listeners (addEventListener)
  - Common events (click, mouseover, mouseout, keydown, load)
- **Practical Exercises**
  - Simple DOM manipulation tasks
  - Event handling exercises

## **Week 6: Advanced Topics**

- **ES6 Features**
  - Template literals
  - Destructuring assignment
  - Spread and rest operators
  - Default parameters
  - Promises and async/await
- **Error Handling**
  - try, catch, finally
  - Throwing errors with throw
- **JSON**
  - What is JSON?
  - Converting between JSON and JavaScript objects (JSON.stringify,

- JSON.parse)
- **Local Storage**
  - Using localStorage and sessionStorage for data persistence
- **Practical Exercises**
  - Using ES6 features
  - JSON manipulation tasks

## **Week 7: Working with APIs**

- **What is an API?**
  - Overview of APIs and how they work
- **Fetching Data**
  - Using fetch API
  - Handling responses and errors
- **Asynchronous JavaScript**
  - Callbacks
  - Promises
  - async and await
- **Practical Exercises**
  - Fetching data from a public API
  - Displaying API data on a webpage

## **Week 8: Final Project and Best Practices**

- **Final Project**
  - Develop a web application that incorporates all learned concepts
  - Example projects: To-do list, weather app, simple game
- **Best Practices**
  - Writing clean and maintainable code
  - Commenting and documentation
  - Debugging techniques and tools (browser dev tools, console.log, breakpoints)
- **Performance Optimization**
  - Efficient DOM manipulation
  - Minimizing reflows and repaints
  - Code splitting and lazy loading
- **Security Considerations**
  - Avoiding common security pitfalls (XSS, CSRF)
  - Safe handling of user input

## **Resources and Further Reading**

- **Documentation**
  - [MDN Web Docs - JavaScript](#)
- **Practice Platforms**
  - freeCodeCamp JavaScript Challenges
  - Codecademy JavaScript Course
  - [JavaScript.info](#)