**Unit 6: Introduction to JS Frameworks and Libraries**

**Duration:** 5 hours

**Overview**

This unit introduces JavaScript libraries and frameworks that simplify web development. Students will familiarize themselves with jQuery for easier DOM manipulation and explore popular frameworks like React, Angular, and Vue.js. Additionally, they will learn how to choose the right framework for specific project requirements.

**6.1 jQuery**

**6.1.1 Why jQuery**

* Simplifies common JavaScript tasks, such as DOM manipulation and event handling.
* Cross-browser compatibility ensures consistent behavior across different browsers.
* Provides a simple API for AJAX calls.

**6.1.2 jQuery Fundamentals**

* **Syntax**: jQuery uses the $ symbol as a shortcut to select and manipulate elements.
* **Selectors**: Powerful and easy-to-use selection of HTML elements.
* **Chaining**: Perform multiple operations on selected elements in a single statement.

**6.1.3 Manipulating DOM Elements**

* Add, remove, or modify HTML content dynamically.
* Examples:
  + Adding or removing CSS classes.
  + Changing the attributes of HTML elements.

**Example Code:**

// Basic jQuery example

$(document).ready(function() {

// Select an element and change its text

$("#myElement").text("Hello, jQuery!");

// Add a CSS class to an element

$("#myElement").addClass("highlight");

// Hide an element

$("#myElement").hide();

// Show an element

$("#myElement").show();

});

**6.2 Overview of Popular Frameworks/Library**

**React**

* **Developed by:** Facebook.
* **Use Case:** Building reusable UI components and handling dynamic user interfaces efficiently.
* **Key Features:**
  + Virtual DOM for faster updates.
  + Component-based architecture.

**Angular**

* **Developed by:** Google.
* **Use Case:** Building dynamic single-page applications (SPAs).
* **Key Features:**
  + Two-way data binding.
  + Dependency injection for better modularity.

**Vue.js**

* **Developed by:** Evan You.
* **Use Case:** Progressive framework for building user interfaces.
* **Key Features:**
  + Reactive data binding.
  + Easy to integrate with other projects or libraries.

**6.3 Choosing the Right Framework for Projects**

**Factors to Consider:**

* **Project Requirements:** Complexity, scalability, and type of application.
* **Learning Curve:** Developer familiarity with the framework.
* **Community Support:** Availability of resources and active user base.
* **Performance:** Rendering speed and efficiency.

**Example Scenarios:**

1. **Simple Projects:** Use jQuery for quick DOM manipulation.
2. **Complex UIs:** Choose React for its component reusability.
3. **Enterprise-Level SPAs:** Use Angular for its comprehensive features.
4. **Progressive Enhancement:** Use Vue.js for its flexibility and ease of integration.

**Summary:** This unit provides a foundational understanding of JavaScript libraries and frameworks, including hands-on experience with jQuery. By exploring React, Angular, and Vue.js, students gain the knowledge to choose the best tools for their projects.