Lesson Plan
Axiom Full Stack Development Module A - JavaScript in Practice

Summary

1. Subject(s): HTML, CSS, JS
2. Topic or Unit of Study: Introduction to Front End Development for the Web
3. Objective: The objective of this module is to get a hands on understanding of HTML, CSS, and JS. By the end of the module we will have built 20 projects.
4. Time Allotment: Saturdays & Sundays - 11 AM - 1 PM

3 Demo Classes (Complete Project 1 - HTML Form Validation)

Class 1: https://drive.google.com/file/d/11KMQPHlLrBst0gGUdJqp4Z3ifq57UX9X/view?usp=sharing

Class 2: https://drive.google.com/file/d/1cTUJVmFmevD28GCdg4RR1g_L9YwQv4Ju/view?usp=sharing

Class 3: https://drive.google.com/file/d/1RZzJZuI2gYQFhwVKqBLoaInER5yu6dyd/view?usp=sharing

Implementation

Learning Context

This module will be completely hands-on, we will develop 20 projects to demonstrate our understanding of HTML, CSS, and JavaScript.

Procedure

a. Watch intro videos (links above)
b. Guided project based practice (in class)
c. Independent Practice (at home)

Materials & Resources

a. Instructional Materials:
   a. HTML & CSS Textbook - *HTML and CSS* by Wiley
   b. JavaScript Textbook - *A Smarter Way to Learn JavaScript* by Mark Meyers
b. Resources:
   a. HTML Videos by Hira Khan
   b. CSS Videos by Hira Khan
   c. JavaScript Videos by Zeeshan Hanif
   d. Git Videos by Zeeshan Hanif

Projects

1. HTML Form - Client side form validation with HTML

   Check required, length, email and password match

   ● Create form UI
   ● Show error messages under specific inputs
   ● checkRequired() to accept array of inputs
   ● checkLength() to check min and max length
   ● checkEmail() to validate email with regex
   ● checkPasswordsMatch() to match confirm password

2. Seat Selection at Movie Theater

   Select from movie choices and seats in a theater in order to purchase tickets

   ● Display UI with movie select, screen, seats, legend & seat info
   ● User can select a movie/price
   ● User can select/deselect seats
   ● User can not select occupied seats
   ● Number of seats and price will update
   ● Save seats, movie and price to local storage so that UI is still populated on refresh

3. Video Player

   Custom video player using the HTML5 video element and it's JavaScript API with a custom design

   - Display custom video player styled with CSS
   - Play/pause
   - Stop
   - Video progress bar
   - Set progress bar time
   - Display time in mins and seconds

4. Calculating Exchange Rates

   Select countries to get the exchange rate for a specific amount

   - Display UI with 2 select lists for countries and 2 inputs for amounts
   - Fetch exchange rates from API (https://api.exchangerate-api.com)
   - Display the values for both countries
   - Update values on amount change
   - Swap country rates

5. DOM Arrays Methods

   Project to teach high order array methods and DOM manipulation

   - Fetch random users from the randomuser.me API
   - Use forEach() to loop and output user/wealth
   - Use map() to double wealth
   - Use filter() to filter only millionaires
   - Use sort() to sort by wealth
   - Use reduce() to add all wealth

6. Landing Page with Sliding Menu and Modal Window

   Simple landing page with sliding menu and modal

   - Create and style landing page
   - Style side nav and modal
   - Add functionality to make menu open/close on button click
   - Add functionality to make modal open/close on button click

7. Classic Hangman Game

   User can select letters from keyboard to guess the word in a certain number of tries

   ● Display hangman pole and figure using SVG
   ● Generate a random word
   ● Display word in UI with correct letters
   ● Display wrong letters
   ● Show notification when select a letter twice
   ● Show popup on win or lose
   ● Play again button to reset game

8. Random Food Selector

   Search and generate random meals from the themealdb.com API

   ● Display UI with form to search and button to generate
   ● Connect to API and get meals
   ● Display meals in DOM with image and hover effect
   ● Click on meal and see the details
   ● Click on generate button and fetch & display a random meal

9. Expense Tracking

   Keep track of income and expenses. Add and remove items and save to local storage

   ● Create UI for project
   ● Display transaction items in DOM
   ● Show balance, expense and income totals
   ● Add new transaction and reflect in total
   ● Delete items from DOM
   ● Persist to local storage

10. Music Player

    Create UI to play music stored in the "music folder" using the HTML5 audio API

    ● Create UI for music player including spinning image and song detail popup
    ● Add play and pause functionality
    ● Switch songs
    ● Progress bar

11. Infinite Scrolling App

Display posts from jsonplaceholder and add infinite scroll to fetch posts and also add filter box

- Create UI & custom CSS loader animation
- Fetch initial posts from API and display
- Scroll down, show loader and fetch next set of posts
- Add filtering for fetched posts

12. Fast Typing Game

Game to beat the clock by typing random words

- Create game UI including a difficulty setting
- Generate random word and place in DOM
- Score increase after word is typed
- Implement timer
- Add certain amount of time after word is typed based on difficulty
- Store difficulty setting in local storage

13. Memory Cards

Flash card app for learning. Display, add and remove memory cards with questions and answers

- Create flip cards using CSS
- Create "Add new card" overlay with form
- Display question cards and flip for answer
- View prev and next cards
- Add new cards to local storage
- Clear all cards from local storage

14. A text to speech app for non-verbal people. Pre-made buttons and custom text speech. This project uses the Web Speech API

A text to speech app. Pre-made buttons and custom text speech. This project uses the Web Speech API.

- Create responsive UI (CSS Grid) with picture buttons
- Speaks the text when button clicked

- Drop down custom text to speech
- Speaks the text typed in
- Change voices and accents

15. Search for Lyrics

     Find songs, artists and lyrics using the lyrics.ovh API

     - Display UI with song/artist input
     - Fetch songs/artists and put in DOM
     - Add pagination
     - Add get lyrics functionality and display in DOM

16. Breathing Exercise for Relaxing

     A relaxing breathing app with a visual director to tell you when to breathe in, hold and breathe out

     - Create circle and gradient circle with CSS
     - Create and animate pointer (Small circle)
     - Create grow and shrink animations
     - Add JavaScript to create the breath animation effect

17. Sortable List

     Display a scrambled list that can be sorted with drag and drop

     - Create an ordered list (10 largest countries)
     - Scramble list items randomly
     - Allow user to drag and drop an item to a different position
     - Button to check if items are in correct order
     - Show green for correct order and red for wrong order

18. Breakout

Game where you control a paddle with the arrow keys to bounce a ball up to break bricks. This app uses the HTML5 canvas element and API

● Draw elements on canvas
● Use canvas paths to draw shapes
● Add animation with requestAnimationFrame(cb)
● Move paddle on arrow key press
● Add collision detection
● Keep score
● Add rules button with slider

19. New Year Countdown

Landing page that counts down from the current date to the next new year

● Create landing page with HTML/CSS
● Calculate the days, hours, mins and seconds to the new year
● Insert values into the DOM
● Show a spinner right before loading the countdown
● Show the coming year in the background

Module B Final Project

Students will create a comprehensive final project of their choosing demonstrating lessons learned in this module.