Introduction To JavaScript

Presented by AcademiaEdge

Teacher: Yinuo Huang

Date and Timings: Thursday, 8PM - 9PM EST
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Requirements:

- A personal Google account
- Age 9 years old or older
- Interested in the world of programming

Class Description: (Give a quick 2 to 3 sentence description of your course)
Introduction to JavaScript is a course offered by AcademiaEdge, a nonprofit organization created by high school programmers. In this course, you will learn the basics about programming in JavaScript -- one of the languages for web development. We will be doing fun projects throughout the course; for each class, we will have practice problems and quizzes for students. Note that this course only covers “Vanilla JavaScript” -- the JavaScript that runs in your browser. This course will not cover anything about NodeJS, Deno, or other server runtimes. (Although students are free to ask me any questions about them.)
Also note that we will be using the most modern syntax of JavaScript, meaning we will be using ES6+ features.

About the Teacher:
I am Yinuo (feel free to pronounce it like EE-NOU), an student Asian programmer. One thing I love about programming is that you can automate the computer to turn human-readable text into computer-understandable bytecodes! I mainly focus on parsing and interpreter/compiler designing. I am also good at making web apps -- that is why I want to let you guys know how easy web developing is with JavaScript!

Syllabus:

First Class Schedule (special):

10 minutes	Introduction to JavaScript -- What is JavaScript?
20 minutes	Setting up JavaScript environment (code editor, browser, HTML template for running JavaScript)
15 minutes	Guide students through writing their first JavaScript “Hello World” program. Help answer any questions and fix any bugs.
15 minutes	Guide students through class resources, quizzes, syllabus

General Class Schedule:

5 min	Go over assigned practices; answer any questions regarding it
10 min	Introduction to today’s lesson
30 min	Examples and practices to guide students through the lesson
10 min	Let students try some simple problems out in class
5 min	Reflection on today’s lesson; go over the homework; answer any questions

Course Content

1. First Class
    a. Introduction to JavaScript -- What is it?
    b. Setting up Visual Studio Code -- The Code Editor
    c. Setting up HTML to run JavaScript
    d. Running your first JavaScript “Hello World” program
    e. Class policies, resources, and homework rules
    f. Q&A
2. Coding Conventions
    a. JavaScript Syntax -- Brackets and Parentheses
    b. JavaScript Comments -- Block Comments, Line Comments
    c. JavaScript Naming Convention -- camelCase, UPPERCASE
    d. JavaScript Style Convention -- When and when not to add spaces
3. Interacting with User -- Inputting and Outputting values
    a. The Console Object -- brief introduction
        i. console.log(), console.error(), and console.clear()
    b. The Window Object -- brief introduction
        i. window.prompt(), window.alert()
4. JavaScript Literals -- Numbers and Strings
    a. Numbers
        i. Integers
        ii. Floats
        iii. Binary Operations: +, -, *, /, %
    b. Strings
        i. Syntax
        ii. String escape
        iii. Some useful String methods
    c. Booleans
        i. true/false
        ii. Empty values
    d. Type casting
        i. Incompatible types
        ii. “1” + 1 = “11” ???
5. JavaScript Variables
    a. Var statement
    b. Let statement
    c. Const statement

    d. Reassignment
    e. Type problems
    f. Undefined problems
    g. Scopes
6. Let the computer make decisions: comparisons, if, else, else if, switch
    a. Comparison between Objects
        i. Problem with Strings
    b. What are conditional statements?
    c. If, else, else if
    d. Switch statement
7. Project #1: Simple calculator
    a. Review the previous classes, briefly
    b. Learn to put everything together: Step by step
    c. Guide students on the process of the calculator
    d. Explain the project

Knowledge used in this project: Variables, I/O, Type casting, conditional statements, binary operations.

8. Arrays & Objects
    a. Review Project #1, explain code
    b. Thinking the programmer's way: start from 0, not 1.
    c. Array
        i. Syntax
        ii. Useful Array methods
        iii. Array indexing
    d. Object
        i. Syntax
        ii. Name, value, named values
        iii. Object item accessing
        iv. Properties
        v. Useful Object methods
9. Loops
    a. Do something X times
        i. For loops
        ii. Break
        iii. Continue
    b. Do something for each item in X
        i. For … in loops
        ii. For … of loops
    c. While X, do something

    i. While loops
10. Functions
    a. Syntax
    b. Declaring a function
    c. Parameters, arguments
    d. The return keyword
    e. Arrow functions
    f. Scopes
    g. Calling functions
    h. Use cases: Examples
    i. New efficient way to iterate through an array: Array.forEach + function
11. Classes
    a. What is Object-Oriented Programming (OOP)?
    b. Why are classes needed?
    c. Constructors
    d. `this` keyword
    e. `super` and `extends` keyword
    f. Fields, methods
    g. Creating classes and using them
    h. Examples in JavaScript
12. Interacting with the web page (DOM)
    a. The Window object, detaily explained
    b. The document object
    c. HTML element object
    d. `getElementById().innerHTML` and other methods explained
    e. Show your JavaScript result to the web page, not the console
13. JavaScript `Math` library and final project
    a. Math library explained
    b. Generate random numbers with Math.random
    c. Final Project: Your own algorithm generator
    d. Example: Fibonacci sequence
    e. Explain expectations on the project
14. Final Project: show and tell
    a. Each student (if comfortable) will show their project to everybody. It will not be graded or something, but the teacher will be giving suggestions to the students' work. Students will share their code and present how it works and what is the project about.
    b. Students will be sharing their thoughts on the course. They can also ask any questions regarding anything related to programming :)

Rules and Expectations

Classroom Procedures:

Students are to stay muted at all times except if they have a question or when asked to be unmuted. The student may temporarily unmute himself to ask his/her question. Alternatively, if the student would not like to speak in front of the class, then the student may ask his/her question in the Zoom chat. We encourage students to ask questions and regularly participate in class. Also, we would like students to be respectful to their classmates and teachers.

Students, please do not:

- Eat or drink with your microphone turned on
- Be disrespectful to teachers or other students
- Put inappropriate pictures on your webcam
- Send inappropriate messages in the class chat

Please do:

- Ask questions
- Be attentive
- Be engaged and active throughout the class
- Make sure to have your camera on throughout the class
- Do assignments thoroughly
- Submit assignments before the deadline
- Have Fun!

Google Classroom Layout:

Each lesson's recording will be found on google classroom along with the class's slides and notes. Homework assignments will be assigned and submitted via google classroom as well. Students can ask questions through the messaging system in google classroom or via email.

Homework procedures:

Students will be given homework in google classroom via google docs, which will consist of inserting screenshots or short-answer/multiple-choice questions, or google forms. The google forms will mainly be used for knowledge checks, while the google docs will be used for general homework assignments. Each assignment is due 24 hours before the next class to give ample time for teachers to grade students' assignments. Students should send a message or an email if they are unable to turn in their homework by then with a valid explanation of why they will not be able to turn in their homework by the deadline, and the teachers will come up with a possible solution. This also applies to missing a class. Course projects will also be assigned and submitted through Google Classroom. If a student misses an assignment deadline repeatedly an email will be sent to his/her parents.