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| **Week 1**  **Week 2**  **Week 3**  **Week 4**  **Readings**  **Activity**  **Assignments** | **PWA1**(2333) |

**Course Description**

The PWA1 course trains students in the technologies used to create dynamic content for the Web using a client-side programming. This course builds upon the coding and logic concepts learned in the Web Programming Fundamentals (WPF) course, continuing the use of Javascript. Students are also shown more advanced concepts such as data structures and key algorithms.

* + - * Client-Side Web Programming
      * Common Client-Side Algorithms
      * Web Data and Validation
      * Programming for Code Libraries & Reuse

**Course Objectives**

Through the various components of study and application, students will realize these objectives by completing the following milestones:

* Control Structures
  + - * Demonstrating problem solving techniques by branching code using conditional logic
      * Utilizing nested if and switch statements
      * Understanding the ternary operator
      * Creating loops to iterate through elements of an array or properties of an object
      * Understanding the differences between while and for loops
* Data Structures
  + - * Recognizing the different types of data structures such as objects and arrays
      * Modify contents of an Array via array access notation and array methods
      * Creating and manipulating object literals
      * Sorting and extrapolating data within objects and arrays
      * Understanding efficient implementation
* JavaScript and HTML
  + - * Controlling HTML
      * Add, Update, Remove HTML elements using DOM
      * Displaying dynamic content
      * Working with forms and Events
      * Understand enclosure and scope levels
      * Create an interactive custom library
      * Creating and Parsing JSON

**Course Outcomes**

Upon successful completion of this course, students will be able to:

* Manipulate web browser DOM (Document Object Model) elements
* Enhance HTML forms with client-side functionality and validation
* Create data visualization with the canvas API
* Be able to read error codes and interpret their messages

**Course Resources**

* Book: Modern JavaScript - Develop and Design by Larry Ullman
* JavaScript Documentation Site: <http://dochub.io/#javascript/>

**Week 1 - “JavaScript Basics” .**

* + - **Week 1 Learning Objectives:**
      * **Goal 1:**
  1. Review the course content from WPF (basic programming using JavaScript)
  2. Ensure all systems for each student is setup properly (GIT, Editor)
  3. Assess current WPF skills with a development assignment
     + - **Goal 2:**
  4. Methods (strings, numbers, typeof) and programming items (functions, switch) not covered in WPF
  5. Basic Arrays
  6. Loops
  7. Assess comprehension and ability to apply new skills with a development assignment

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| **Goal 1** |
| * + - **Introduce Yourself (Video)**     - **Course Overview:** * Review the course objectives (above) * Review the course materials:   + - * + schedule: See “PWA1: On-Campus / On-Line Schedule”         + review FSO items         + this weeks learning objectives     - **Goal 1 Course Material:**        * Setup: (for those who have not already done the below)   + **Version Control (GIT UP)**   - setup, configure, test, and using GIT  - create the file structure and organization needed for delivering assignments and activities   * + **Getting Started (Editor, Setup)** - Setup Development Environment   - setup editor  - connect JavaScript file to HTML   * Display JavaScript Output * Problem Solving * Variables & Values (w/ programming activities) * Conditionals (w/ programming activities) * Functions (basic, arguments, parameters, returning values) (w/ programming activities)   + - Highlight a completed program structure (in order to complete the assignment)     - **Goal 1: “The Duel - Part I”** * **Skills Used**: functions, variables, conditionals, expressions, string concatenation, random numbers, loops, break, alerts, basic logic and critical thinking   + - * + comprehend the use of functions and compartmentalizing code         + use arguments and parameters and understand return values from a function         + break down code logic and perform critical thinking         + assemble proper control structures using a for loop and the break command         + generate random numbers within a specified range         + demonstrate your understanding of the code - implement detailed comments  |  | | --- | | **Goal 1 - continue** |  * + - **MONDAY - GoToMeeting (optional for On-Campus Students)**       * Welcome message       * Determine who are on-line students, on-campus students, and who may have tested out of WPF       * Introduce the Course and Schedule:         + Check to see who reviewed the videos:   course objects  schedule  review items in FSO (i.e contact, office hours, rubrics, etc...)  how to succeed in this course   * + - * This weeks learning objectives - open discussion on WPF materials       * Review items for this week * **Optional Items:**    + - * Reading   + Modern JavaScript:   - variables and values: pg 92 - 127,  - conditionals: pg 129 - 142, 153 - 156  - functions: pg 221 - 235   * + - * Website Reviews         + No websites are recommended at this time |

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| **Goal 2** |
| * + - **Discussion review of Goal 1**     - **Goal 2 Course Material:**        * More basic programming items not covered in WPF (w/ programming activities)   + more.Strings : Methods   + more.Numbers : Methods   + more.Booleans : Truthy / Falsy   + basic.Arrays (need push, pop, splice)   + more.Operators : TypeOf   + more.Conditional : switch   + more.Function   + more.Function - Self Executing Functions (refactoring)   + loops    * + - **Goal 2: “JavaScript Practice”** * **Skills Used**: many of the new methods and items above   + demonstrate through the development of JavaScript code the comprehension of the training materials   + analyze JavaScript code and validate through testing the deliverables are meeting the requirements     - **Goal 2: “The Duel - Part II”** * **Skills Used**: in addition to the skills used in “Duel Part I”, the student will need to refactor their code to include more advanced Functions and include Arrays   + - * + break down existing code and modify its functionality         + convert variable references to a more efficient Array literal   + create an array and use array access notation   + demonstrate your understanding of the code - implement detailed comments    * + - **5 Minute Reflection Video**: * What was the most positive experience you learned this week? * What was the most difficult item to understand this week? * Demonstrate your understand of the code for Duel I and Duel 2 * **Optional Items:**    + - * Reading   + Modern JavaScript:   - arrays: pg 190 - 206   * + - * Website Reviews         + No websites are recommended at this time |



**Week 2 - “Building on the Basics”**

* + - **Week 2 Learning Objectives:**
      * **Goal 3:**

1. Debugging
2. Scope / Closure
3. Assess comprehension and ability to apply new skills with a development assignment
   * + - **Goal 4:**
   1. Basic Object Overview
   2. Basic DOM
   3. Events & Handlers
   4. Assess comprehension and ability to apply new skills with a development assignment
      * + **Goal 5:**
   5. Regular Expressions
   6. Math Methods
   7. Date Methods
   8. Assess comprehension and ability to apply new skills with a development assignment

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| **Goal 3** |
| * + - **Discussion review of Goal 2**     - **Goal 3 Course Material:**        * Learn the art of debugging JavaScript code       * Scope / Closure (w/ programming activities)    * + - **Goal 3: “Debugging”** * **Skills Used**: debugging JavaScript code   + - * + demonstrate the comprehension of the training materials         + demonstrate the ability to use browser feedback to resolve code issues   + utilize testing practices to resolve code issues   + ability to troubleshoot syntax, run time and logical code issues   + demonstrate your understanding of the code - implement detailed comments    * + - **MONDAY - GoToMeeting (optional for On-Campus Students)**       * Review of Week 1’s materials, assignments and activities       * This weeks learning objectives - open discussion       * Review items for this week * **Optional Items:**    + - * Reading       * Website Reviews         + No websites are recommended at this time |

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| **Goal 4** |
| * + - **Discussion review of Goal 3**     - **Course Overview:** * Review this weeks learning objectives (above)   + - **Goal 4 Course Material:** * Basic Object Overview (w/ programming activities) * DOM Introduction (w/ programming activities)   - Output to the browser using InnerHTML   * Events & Handlers (w/ programming activities)   + - **Goal 4: “Guessing Game”** * **Skills Used**: JavaScript items from week1, implementing objects, using the DOM, output data using InnerHTML, using the delegated model, basic logic and critical thinking   + create a JavaScript solution from scratch   + write to the browser using innerHTML (HTML assets provided)   + demonstrate your understanding of the code - implement detailed comments     - **Goal 4: “The Duel - Part III”** * **Skills Used**: JavaScript items from week1, implementing objects, using the DOM, output data using InnerHTML, basic logic and critical thinking   + refactor the “Duel II” code to include Events and Handlers   + write to the browser using innerHTML (HTML assets provided)   + demonstrate your understanding of the code - implement detailed comments    * **Optional Items:**    + - * Reading       * Website Reviews         + No websites are recommended at this time |

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| **Goal 5** |
| * + - **Discussion review of Goal 4**     - **Goal 5 Course Material:** * Regular Expressions (w/ programming activities) * Math Methods (w/ programming activities) * Date Methods (w/ programming activities)   + - **Goal 5: “Form Validation”** * **Skills Used**: ALL JavaScript items from previous Goals, implement regular expressions, basic logic and critical thinking   + create regular expressions in various ways   + implement feedback to the user in an online form (HTML assets provided)   + refactor the the code in DRY from   + demonstrate your understanding of the code - implement detailed comments    * + - **5 Minute Reflection Video - Form Validation**: * What was the most positive experience you learned from this assignment? * What was the most difficult item to understand? * Demonstrate your understand of the code for “Duel III” and “Guessing Game” * **Optional Items:**    + - * Reading       * Website Reviews         + No websites are recommended at this time |

**Week 3 - “Advanced JavaScript”**

* + - **Week 3 Learning Objectives:**
      * **Goal 6:**

1. Reflection - Build something
2. Assess comprehension and ability to apply new skills learned over the last 2 weeks with a Mid-Term Practical
   * + - **Goal 7:**
   1. Adv. objects using THIS, NEW, prototype and constructors (w/ programming activities)
   2. Assess comprehension and ability to apply new skills with a development assignment
      * + **Goal 8:**
   3. Basic libraries (w/ programming activities)
   4. Assess comprehension and ability to apply new skills with a development assignment

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| **Goal 6** |
| * + - **Discussion review of Goal 5**     - **Goal 6 Course Material:** * Reflection - Build Something (programming activity)   + - **Goal 6: “Mid-Term Practical”** * **Skills Used**: array of objects, loops, output data using console.log and innerHTML, work with arrays (output the data of an array, pushing items into an array, Math & Date methods, functions, basic logic and critical thinking.   + create a JavaScript solution from scratch   + create an array of objects   + utilize events and handlers   + utilize a date method   + utilize a math method   + output data via console.log   + write to the browser using innerHTML (HTML assets provided)   + demonstrate your understanding of the code - implement detailed comments    * + - **MONDAY - GoToMeeting (optional for On-Campus Students)**       * Review of Week 2’s materials, assignments and activities       * This weeks learning objectives - open discussion       * Review items for this week |

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| **Goal 7** |
| * + - **Discussion review of last week**     - **Course Overview:** * Review this weeks learning objectives (above)   + - **Goal 7 Course Material:** * Adv Objects   + Review the ideas and concepts of THIS   + Review instantiation of an object using NEW   + Review prototypes & constructors     - **Goal 7: “Objects”** * **Skills Used**: ALL JavaScript items up to this point, THIS, instantiation of an object, creating and using prototypes and constructors, basic logic and critical thinking   + Randomly select data from an array and display the information a few times per sec, using a timer. Write to the browser using innerHTML (HTML assets provided).   + using THIS, in a constructor   + breaking apart a constructor to create a prototype   + demonstrate your understanding of the code - implement detailed comments    * + - **Optional Items:**        * Reading       * Website Reviews         + No websites are recommended at this time |

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| **Goal 8** |
| * + - **Discussion review of Goal 7**     - **Goal 8 Course Material:** * Custom Libraries   + Review the ideas and concepts of the RYU library (from SFW1)   + Highlight how constructors and prototypes are being used in terms of a custom library     - **Goal 8: “Custom Library”** * **Skills Used**: ALL the JavaScript items before this Goal, self-executing functions, prototypes & constructors used for library, basic logic and critical thinking   + prep javascript files for a library   + learn about building a JavaScript library by integrating the previous code developed in previous assignment    * + - **5 Minute Reflection Video - Custom Library**: * What was the most positive experience you learned from this assignment? * What was the most difficult item to understand? * Demonstrate your understand of the code for “Objects” and “Libraries” * **Optional Items:**    + - * Reading       * Website Reviews         + No websites are recommended at this time |

**Week 4 - “Sneak Peak & Finals”**

* + - **Week 4 Learning Objectives:**
      * **Goal 9:**

1. JSON
2. Advanced Arrays (more.Scope)
3. Structural pattern (Modular Pattern, Factory Pattern)
4. Assess comprehension and ability to apply new skills learned over the last week
   * + - **Goal 10:**
   1. Data Visualization using Canvas (w/ programming activities)
   2. Assess comprehension and ability to apply new skills with a development assignment
      * + **Goal 11:**
   3. Assess comprehension and ability to apply ALL new JavaScript skills using a Final Practical

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| **Goal 9** |
| * + - **Discussion review of Goal 8**     - **Goal 9 Course Material:** * JSON * Advanced Arrays (more.Scope) * Structural pattern (Modular Pattern, Factory Pattern)   + - **Goal 9: “Advanced JavaScript”** * **Skills Used**: ALL the JavaScript items before this Goal   + WE ARE DETERMINING WHAT WILL STAY IN THIS SECTION.    * + - **MONDAY - GoToMeeting (optional for On-Campus Students)**       * Review of Week 3’s materials, assignments and activities       * This weeks learning objectives - open discussion       * Review items for this week * **Optional Items:**    + - * Reading       * Website Reviews         + No websites are recommended at this time |

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| **Goal 10** |
| * + - **Discussion review of Week 3**     - **Course Overview:** * Review this weeks learning objectives (above)   + - **Goal 10 Course Material:** * Data Visualization using Canvas ((w/ programming activities)   + - **Goal 10: “Data Visualization”** * **Skills Used**: ALL the JavaScript items before this Goal, HTML5’s Canvas, basic logic and critical thinking   + IN DEVELOPMENT    * + - **Optional Items:**        * Reading       * Website Reviews         + No websites are recommended at this time |

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| **Goal 11** |
| * + - **Discussion review of Goal 10**     - **Goal 11 Course Material:** * Final Practical   + - **Goal 11: “Final Practical:** * **Skills Used**: ALL the JavaScript items before this Goal, basic logic and critical thinking.   + refactor the Mid-Term assignment   - replace the hardcoded object with a call to a constructor to create an object  - push the object into an array of objects   * + create a constructor   + add a GPA KEY in an object   + create a prototype to calculate the average GPA   + refactor any other code to reduce duplication, using functions   + output data via console.log   + write to the browser using innerHTML (HTML assets provided)   + demonstrate your understanding of the code - implement detailed comments    * + - **5 Minute Reflection Video - Data Visualization**: * What was the most positive experience you learned from this course? * What was the most difficult item to understand in this course? * Demonstrate your understand of the code for “Data Visualization” |