South Central College

COMP 1130  Programming Fundamentals

Course Outcome Summary

Course Information

Description
Programming Fundamentals is designed to be a person’s first exposure to the world of computer programming. This course covers how to design and implement a computer program, writing a program that will make different types of decisions, how to solve problems using computer programs that remember things, make decisions, and perform repetitive tasks. The course uses JavaScript to help the student meet these objectives. JavaScript, is a popular language used for by web browsers to get input from the user. JavaScript teaches client-side scripting. This course is part of the Web Programming Certificate and the AAS Information Systems programming degree at South Central College.

Total Credits 4
Total Hours 16

Types of Instruction

Instruction Type Credits/Hours
Online/lecture

Institutional Core Competencies

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. **Install and Use the Classes and objects**
   Learning Objectives
   Establish the steps in designing and implementing a program.
   Use the built-in Alice functions to control objects.
   Set and modify the properties of an object
   Create new objects from pre-defined classes
   Explore composite objects (objects made up of other objects)

2. **Use methods to handle data**
   Learning Objectives
   Write methods to add potential behaviors to objects
   Declare and set variables (Alice’s short-term memory)
Use variables to calculate new results
Create random numbers within a certain range
Write methods to accept parameters

3. **Make decisions and use loops**

   **Learning Objectives**
   Make decisions in your program using an if/else statement
   Have your program make decisions based on the contents of a variable
   Describe the difference between equality operator, relational operators, and Boolean functions
   Run repeating statements using while (indefinite looping)
   Run repeating statements using loop with a counter (definite looping)
   Nest if/else statements and loops

4. **Use Events to control the program**

   **Learning Objectives**
   Explore the different types of events that Alice will process.
   Describe the difference between loop processing and event processing.
   Create events that respond immediately to the keyboard or mouse.
   Use events to monitor conditions and change the the values of variables

5. **Make a list and check it twice (using arrays)**

   **Learning Objectives**
   Explore data structures by building a list of things.
   Explore data structures by building an array of things.
   Describe the difference between a list and an array.
   Use the For all together and For all in order statements in a program.
   Change the contents of a list dynamically using built-in list methods
   Randomly choose an object in a list or array.

6. **Create a web page and view the file in a browser**

   **Learning Objectives**
   Create an HTML document using the essential HTML commands common to every web page.
   Display the web page file using a browser without going out on the Internet.
   Incorporate effective commenting in a web page.
   Demonstrate the value of a header comment block for each web page.
   Create a useful skeleton (or HTML template) to speed web page development.
   Utilize at least three different heading tags in a web page.
   Establish a working system for developing HTML code working between the HTML code editing window and viewing the page (the browser).

7. **Use variables to remember things for the browser**

   **Learning Objectives**
   Write a paragraph describing the three different data types.
   Declare and initialize different types of variables

8. **Use debugging techniques and tools to watch variables change and program flow.**

   **Learning Objectives**
   Write special print statements to help track contents of variables.
   Use selective commenting to determine where bugs are located in code.
   Use a debugging tool to step through a program and view the variables as they change.

9. **Write functions that the browser can use to do things.**

   **Learning Objectives**
   Declare a function in the head element of the web page.
   Call the function from the body element of the web page.
   Write a function that is expecting parameters.
   Call a function passing parameters to it.
   Call a function that returns information and display it on the web page.
10. **Utilize operators and expressions.**

   Learning Objectives
   Use the mathematical operators in a function.
   Use the assignment operator "=" to store information in a variable.
   Use the comparison operators to help make decisions.
   Use logical operators to help make decisions.

11. **Demonstrate the use of control statements.**

   Learning Objectives
   Demonstrate the use of the if/else statement.
   Demonstrate the difference between if/else and switch statements in a program.
   Demonstrate use of the for statement in a JavaScript.
   Demonstrate use of the while statement in a JavaScript.
   Demonstrate the scope of variables.

12. **Incorporate events and event handling for user participation.**

   Learning Objectives
   Use the click event: onClick
   Use the mouseover event: onMouseOver
   Use the load event: onLoad
   Use the focus event: onFocus

13. **Demonstrate the Class/object model used in JavaScript.**

   Learning Objectives
   Demonstrate how to create a JavaScript object using the keyword "new".
   Demonstrate the use of String objects in a program.
   Demonstrate the use of Math objects in a program.
   Demonstrate the use of Date/Time objects in a program.
   Demonstrate the use of the Array objects in a program.
   Explain the difference between a primitive, an object, a property, and a method giving examples of each.

14. **Demonstrate creating interactive forms using JavaScript.**

   Learning Objectives
   Create a web page that uses all the HTML form elements using a JavaScript program.
   Demonstrate the onmouseup and onmousedown button events.
   Demonstrate validating data from a form.
   Demonstrate at least five string methods to parse data input by the user.

15. **Demonstrate access to the web document using the DOM.**

   Learning Objectives
   Describe what a node is.
   Describe the difference between a text node and an attribute node.
   Use the DOM to find elements by their ID.
   Use the DOM to find elements by their tag name.
   Find elements that have the same class name.
   Change the style of an element using the DOM.

16. **Utilize a JavaScript library to save time and money.**

   Learning Objectives
   Compare at least three JavaScript libraries for ease of use, power, documentation.
   Use a JavaScript library to streamline your programming.

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