

## JavaScript

**4 days**

**50% lecture, 50% labs**

**Basic Level**

**Overview:** JavaScript programming is useful for creating dynamic Web pages. It is used to detect and react to user initiated events, such as when the user moves his mouse over a link or image, or presses on a button or key. JavaScript can also improve a Web site with navigational aids, scrolling messages, rollovers, dialog boxes, dynamic images, shopping carts, etc. It has built-in objects that can be used to perform arithmetic calculations, string operations, manipulate the date and time, and validate form input such as e-mail addresses, zip codes, credit cards, etc.

### **Benefits:**

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

- read, write, customize, and debug JavaScript programs.
- understand JavaScript's role and responsibilities; e.g. making Web pages dynamic, using dialog boxes, handling events, forms, images, and links, manipulating windows and frames, form validation, etc.
- learn how to use JavaScript core objects to create arrays, manipulate the time and date, perform mathematical functions, work with strings, etc.
- use the navigator and document object models to manipulate, navigate and program windows, frames, forms, images, etc.
- use JavaScript event handlers to respond to user initiated events
- use regular expressions to validate form data
- debug scripts

**Intended Audience:** *JavaScript Programming* is an introductory course recommended for people developing Web pages for either personal, business, or commercial use.

**Prerequisites:** Students need to be familiar with basic programming constructs and how to use a browser such as Internet Explorer or Netscape.

**Training Approach:** This is an intensive, interactive course, which is approximately 50% lecture and 50% lab. Questions are highly encouraged. On the final day, students are given access to a zipped file containing all of the solutions to the labs and the examples used throughout the notebook.

## Course Outline

### Day 1

#### Module 1 -- Introduction to JavaScript

- What is JavaScript Is?
- What JavaScript is Not
- What JavaScript is Used For
- JavaScript and Events
- What Versions? What Browsers?
- Where to Put JavaScript
- JavaScript and External Files

#### Lab Exercise 1

#### Module 2 -- Script Setup

- The HTML Document and JavaScript
- Syntactical Details
  - Case Sensitivity
  - Free Form and Reserved Words
  - Statements and Semicolons
  - Comments
  - The <script> Tag
- Generating HTML and Printing Output
  - Strings and String Concatenation
  - The *write()* and *writeln()* methods
- About Debugging
  - Types of Errors
  - Debugging Tools

#### Lab Exercise 2

#### Module 3 -- The Building Blocks: Data Types, Literals, and Variables

- Data Types
  - Primitive Data Types
  - Composite Data Types
- Variables
  - Valid Names
  - Declaring and Initializing Variables
  - Dynamically and Loosely

- Typed Language
- Scope of Variables
- Concatenation and Variables

#### Lab Exercise 3

#### Module 4 -- Dialog Boxes

- Interacting with the User
  - The alert Box
  - The prompt Box
  - The confirm Box

#### Lab Exercise 4

### Day 2

#### Module 5 -- Operators

- About JavaScript Operators and Expressions
  - Assignment
  - Precedence and Associativity
- Types of Operators
- Number, String or Boolean? Datatype Conversion
  - The parseInt() method
  - The parseFloat() method
  - The eval() method
- Special Operators

#### Lab Exercise 5

#### Module 6 -- Conditional Statements and Loops

- Control Structures, Blocks, and Compound Statements
- Conditionals
  - If/else
  - If/else if
  - Switch
- Loops
  - The while Loop
  - The do/while Loop
  - The for Loop
  - The for/in Loop

- Loop control
- Nested loops and labels

### Lab Exercise 6

### Module 7 -- Functions

- What is a Function?
  - Function Declaration and Invocation
  - Return Values
  - Functions as Objects

### Lab Exercise 7

### Module 8 -- Objects

- What are Objects?
  - Object Modules and the Dot Syntax
  - Creating an Object with a Constructor
  - Properties of the Object
  - Methods of the Object
- User-Defined Objects
  - The *new* Operator
  - The *Object()* Constructor
  - Creating the Object with a User-Defined Function
  - Defining Methods for an Object
  - Object Literals
- Manipulating Objects
  - The *with* Keyword
  - The *for/in* Loop

### Lab Exercise 8

### Day 3

### Module 9 -- JavaScript Core Objects

- What are Core Objects?
- Array Objects
  - Declaring Arrays

- Properties and Methods
- The Date Object
  - Using Date Object Methods
  - Manipulating Date and Time
- The Math Object
  - Rounding Up and Rounding Down
  - Generating Random Numbers

### Lab Exercise 9

### Module 10 -- The Browser Objects: Navigator, Windows, and Frames

- The Browser Object Model
  - The *navigator* Object
  - The *window* Object
  - Frames
  - The *location* Object
  - The *history* Object
  - The *screen* Object

### Lab Exercise 10

### Module 11 -- The Document Objects: Forms, Images, and Links

- The Document Object Model
  - The JavaScript Hierarchy
  - The Document Itself
- Introduction to Forms
  - HTML Forms Review
  - Input Types
  - The *forms* Object
  - Naming forms and buttons
  - Submitting Fillout Forms
  - Programming Input Devices
  - Simple Form Validation
- Introduction to Images
  - HTML Review of

- Images
  - The *image* Object
- Introduction to Links
  - JavaScript URLs
  - The *links* Object

### Exercise 11

<b>Day 4</b>
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### Module 12 -- Handling Events

- Introduction to Event Handlers
  - Creating an Event Handler
  - Handling a Window or Frame Event
  - Handling a Mouse Event
  - Handling Link Events
  - Handling Form Events
  - Handling Key Events
  - Handling Error Events

### Lab Exercise 12

### Module 13 -- Regular Expressions and Pattern Matching

- What is a Regular Expression?
- Creating a Regular Expression
  - The Literal Way
  - The Constructor Method

### For more information, contact:

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- Properties of the RegExp Object
- String Methods Using Regular Expressions
- The Metacharacters
  - The Dot Metacharacter
  - The Character Class
  - Metasymbols
  - Repeating Patterns
  - Anchors
  - Alternation
- Form Validation with Regular Expressions
  - Checking for Empty Fields
  - Checking for Numeric Zip Codes
  - Checking for Alphabetic Data
  - Removing Extraneous Characters
  - Checking for Valid Social Security Numbers
  - Checking for Valid Phone Numbers
  - Checking for Valid E-Mail Addresses
  - Credit Card Validation

### Lab Exercise 13