

JavaScript and DOM Scripting (1611-201)

Length: 4 days

Description

Today, web users expect web sites to provide advanced features, dynamic user interfaces, and fast response times. To deliver that, you need to know the JavaScript language. Beyond that, though, you need to know how to use JavaScript to script the Document Object Model (DOM).

Section 1 presents a complete subset of JavaScript that includes basic event handling and elementary DOM scripting so you can start writing significant applications right away.

Section 2 presents the rest of the JavaScript essentials, including how to use arrays, functions, regular expressions, exception handling, libraries, and your own object types. You learn advanced skills like how to use closures, recursion, and prototype-based inheritance.

In section 3, you learn how to manipulate both the XHTML and CSS for a web page as you build applications that run slide shows, use drop-down menus, rotate headlines, sort the data in tables, do image rollovers, and provide animation. In the DOM scripting section, you'll learn how to create event-handling libraries that ensure browser compatibility by handling the differences between Internet Explorer and DOM-compliant browsers.

Section 4 shows you how to use the objects, methods, and properties of a web browser.

Audience

This course is for professional web developers who want to use JavaScript effectively, including web developers who know XHTML and CSS and are ready to master JavaScript, web developers who program in ASP.NET, JSP, or PHP on the server side and now want to master client-side coding, web developers who have already read 3 or 4 JavaScript or DOM scripting books but still don't know how to do the type of DOM scripting that's required in real-world applications.

Prerequisites

Knowledge of HTML and CSS, programming experience is helpful, but not required.

Topics

SECTION 1: INTRODUCTION TO JAVASCRIPT PROGRAMMING

INTRODUCTION TO WEB DEVELOPMENT AND JAVASCRIPT

This chapter introduces you to the concepts and terms needed to work with JavaScript.

The architecture of a web application

- How a client-server architecture works
- How static web pages are processed
- How dynamic web pages are processed
- A survey of browsers, servers, and server-side scripting languages
- How JavaScript fits into this architecture

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The core web technologies

- An introduction to XHTML
- An introduction to CSS
- An introduction to the DOM
- An introduction to JavaScript
- The XHTML, CSS, DOM, and JavaScript standards

DOM scripting and AJAX

- How DOM scripting works
- How AJAX works

Two critical web development issues

- Cross-browser compatibility
- User accessibility
- How to access a web page
- How to view the source code for a web page

HOW TO CODE A JAVASCRIPT APPLICATION

In this chapter, you'll learn how to code your first JavaScript applications that get input, do calculations, and display output.

How to edit and test your web pages

- How to edit a web page with Notepad++
- How to test a web page
- How to display error messages in Firefox

Basic JavaScript skills

- How to include JavaScript with the script tag
- How to code JavaScript statements
- How to create identifiers
- The primitive data types of JavaScript
- How to code numeric and string expressions
- How to declare variables and assign values to them

How to use objects in JavaScript

- An introduction to objects, properties and methods
- How to use the window and document objects
- How to use the Number, String, and Date objects
- How to get and display data with a Textbox object

How to code control statements

- How to code conditional expressions
- How to code if statements
- How to code while and for statements

How to create and use functions

- How to create and call a function
- How to code an event handler
- Using HTML to structure a web page

HOW TO TEST AND DEBUG A JAVASCRIPT APPLICATION

This chapter shows you how to test and debug your JavaScript applications using the debugging tools that are provided with a browser.

An introduction to testing and debugging

- Typical test phases for a JavaScript application
- The three types of errors that can occur
- Common JavaScript errors
- How to get error messages with Firefox
- A simple way to trace the execution of your JavaScript code

How to debug with the Firebug extension of Firefox

- How to install and enable the



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- Firebug extension
- How to get information in the Console tab
- How to review your code in the Script tab
- How to use breakpoints and step through code

How to use the Firebug console object

- The methods of the console object
- How to trace an application with Firebug's console.log method

How to test and debug with other browsers

- How to get error messages with Internet Explorer
- How to get error messages with Safari
- How to get error messages with Opera
- How to get error messages with Chrome

SECTION 2: JAVASCRIPT ESSENTIALS

HOW TO GET INPUT AND DISPLAY OUTPUT

This chapter builds on the base skills of getting data and displaying information and shows you more sophisticated techniques for an application to interact with a user.

How to get input

- How to get data from the prompt method
- How to get a response from the confirm method
- How to get the state of a radio button
- How to get the state of a check box
- How to get the selected option in a select list
- How to get data from a text area

- How to use the methods and events for controls

How to display output

- How to display data in a span tag
- How to set the state of a radio button
- How to set the state of a check box
- How to display data in a text area

HOW TO WORK WITH NUMBERS, STRINGS AND DATES

In this chapter covers essentials skills for working with data.

How to work with numbers

- How represent special numerical values
- The methods of the Number object
- How to use the conditional operator

How to use the Math object

- How to use the methods of the Math object
- How to use a random number generator

How to work with strings

- How to use escape sequences in strings
- How to use the methods of the String object

How to work with dates and times

- How to create Date objects
- The methods of the Date object

HOW TO CODE STATEMENTS

This chapter expands on conditional expressions and if, while, and for statements and learn how to use switch, do-while, break, and continue statements.

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How to code conditional expressions

- How to use the equality and identity operators
- How to use the relational operators
- How to use the logical operators

How to code the selection structures

- How to code if statements with else clauses
- How to code if statements with else if clauses
- How to code switch statements
- How to use a flag to simplify your selection structures

How to code the iteration structures

- How to code while loops
- How to code do-while loops
- How to code for loops
- How to use the break and continue statements

HOW TO CREATE AND USE ARRAYS

An array is a standard programming feature that's analogous to a list or table. By using arrays, you can keep related elements together and then process them using iterative structures like for loops.

How to create and use an array

- How to create an array
- How to add and delete array elements
- How to use for loops to work with arrays
- How to use for-in loops to work with arrays
- The methods of an Array object
- How to use the Array methods

Other skills for working with arrays

- How to use a String method to

create an array

- How to create and use an associative array
- How to create and use an array of arrays

HOW TO CREATE AND USE FUNCTIONS

This chapter reviews the basic function writing skills learned previously and presents advanced skills to work effectively.

Basic skills for working with functions

- How to create and call a function
- How values are passed to functions
- How lexical scope works

Object-oriented skills for working with functions

- How to use the arguments property of a function
- How to use the call and apply methods of a function

Advanced skills for working with functions

- How closures work with functions
- How to write recursive functions

HOW TO CREATE AND USE OBJECTS

This chapter shows you how to create and use your own objects and object types.

Basic skills for working with objects

- How to create and use the native object types
- How to create objects of the Object type
- How to extend, modify, or delete an object
- How to create and use your own object types

Advanced skills for working with objects

- How to inherit properties and

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- methods from another object type
- How to add methods to the JavaScript object types
- How to create cascading methods
- How to use the for-in statement with objects
- How to use the in, instanceof, and typeof operators

HOW TO USE REGULAR EXPRESSIONS, HANDLE EXCEPTIONS, AND VALIDATE DATA

This chapter shows you how to use regular expressions and handle any exceptions that might be thrown by an application. Then, it presents a Register application that uses regular expressions and exception handling to do a thorough job of form validation... a real-world example!

How to use regular expressions

- How to create and use regular expressions
- How to create regular expression patterns
- How to use the global and multiline flags
- String methods that use regular expressions
- Regular expressions for data validation

How to handle exceptions

- How to create and throw Error objects
- How to use the try-catch statement to handle exceptions

SECTION 3: DOM SCRIPTING

BASIC DOM SCRIPTING

This chapter builds on the elementary DOM scripting skills taught earlier so you can

develop more complex applications. You work with the common DOM objects, use cross-browser techniques for working with the event object, and use timers in your applications.

How to work with DOM nodes

- An introduction to DOM nodes
- Types of DOM nodes
- The Node interface
- The Document interface
- The Element interface
- The Attr interface

How to work with DOM HTML nodes

- Types of HTML element nodes
- The HTML element interface
- The HTMLAnchorElement interface
- The HTMLImageElement interface
- The HTMLButtonElement interface
- The HTMLInputElement interface

Other DOM scripting skills

- How to cancel the default action of an event
- How to create image rollovers
- How to preload images

How to use timers

- How to call a function once
- How to call a function repeatedly

ADVANCED EVENT HANDLING

Throughout this course, you have been using basic techniques to handle simple events like the click event of a button. In this chapter, you'll learn how to handle a wide range of mouse and keyboard events.

An introduction to event handling

- An overview of event handling
- An overview of XHTML event types
- An overview of mouse event types

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- An overview of keyboard event types

How to use our JavaScript libraries

- How to attach and remove event handlers
- How to use the standardized Event object

The core event models

- How to access the Event object
- The properties and methods of the Event object
- The methods for attaching and detaching event handlers
- Browser-compatible code for attaching and detaching event handlers
- The jslib_event.js file

The mouse event models

- The properties of the Event object
- The sequence of events for a mouse click
- The jslib_event_mouse.js file

The keyboard event models

- The DOM Level 3 properties and methods for the Event object
- The properties of the Event object that are implemented by the major browsers
- The key codes for keyboard events
- The jslib_event_keyboard.js file

ADVANCED DOM MANIPULATION

Many JavaScript applications need to manipulate the DOM tree. This chapter shows you how to detect when the DOM is ready, how to search the DOM, and how to modify it.

How to detect when the DOM is ready

- A problem with the load event
- The code that illustrates this problem
- How to use a ready method to detect when the DOM is ready
- The JavaScript library that contains the ready method

How to search the DOM

- How to use a walk method to walk the DOM tree
- How to use a `getElementsByTagName` method to search the DOM
- A JavaScript library for walking and searching the DOM

How to modify the DOM

- How to create new DOM nodes
- How to add and remove DOM nodes
- How to use a document fragment

HOW TO SCRIPT CSS

In this chapter, you'll learn how to use JavaScript to work with entire style sheets as well as with the styles for a specific element.

How to work with style sheets

- Three types of external style sheets
- How to enable and disable style sheets
- How to add and remove style sheets

How to modify the style of an element

- How to set the style of an element
- How to get the computed style of an element
- How to change the appearance of an element
- How to change the position of an element

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- How to get the current position of an element
- A JavaScript library for working with styles

HOW TO SCRIPT TABLES AND FORMS

This chapter starts off by showing you how to use DOM scripting to add and remove rows and cells in a table and how to sort a table by any of its columns. Then, you'll learn some advanced skills for scripting forms that build on the skills that you learned previously.

How to script tables

- How to add rows and cells
- How to remove rows and cells
- How to reorder rows

How to script forms

- How to handle form events
- How to script radio buttons
- How to script select lists
- A JavaScript library for working with text selections
- How to use the JavaScript library to work with text selections

HOW TO CONTROL THE WEB BROWSER

This chapter shows you how to use DOM scripting to animate elements on a web page, including 2-dimensional and 3-dimensional animations.

How to animate elements

- A review of the math used in animation
- How to change the position of an element over time
- How to detect boundaries
- How to simulate depth

ANIMATION WITH DOM SCRIPTING

This chapter shows you how to use the browser objects to manipulate and print browser windows and to get information about the browser. It also shows you how to use JavaScript to put cookies on a user's web browser and how to read and use those cookies.

How to script browser windows

- How to open and close windows
- How to move and resize windows
- How to scroll a window
- How to print a window
- How to use window events

How to script browser objects

- How to use the navigator object
- How to use the location object
- How to use the history object
- How to use the screen object

How to use cookies

- An introduction to cookies
- How to create cookies
- How to read cookies
- How to delete cookies

HOW TO USE JAVASCRIPT LIBRARIES (OPTIONAL)

In prior chapters, you've learned how to create and use your own libraries. This chapter shows you how to use JavaScript libraries, like jQuery, Dojo, and the Dojo extension, Dijits, that are available from other sources. They're full of browser-compatible, debugged, reusable code that can help you develop complex applications more efficiently.

How to use jQuery

- How to get started with jQuery
- How to select elements with jQuery

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- How to use jQuery effects
- How to handle events with jQuery
- How to use jQuery to work with XHTML elements
- How to use jQuery to work with the DOM

How to use Dojo

- How to get started with Dojo
- How to select elements with Dojo
- How to handle events with Dojo
- How to use Dojo effects

How to use Dijits

- How to get started with Dijits
- How to use the Form Dijit
- How to use the Button Dijit
- How to use the CheckBox Dijit
- How to use the RadioButton Dijit
- How to use the ValidationTextBox Dijit
- How to validate a credit card with ValidationTextBox Dijits
- How to use the FilteringSelect Dijit