



Core AJAX Fundamentals (3 days)

Core Ajax Fundamentals is an in-depth Ajax training course geared for software developers who need to understand what Ajax is and how to use it with today's systems and architectures. This comprehensive course provides a balanced mixture of theory and practical labs designed to take students from the fundamentals of AJAX and its underlying technologies through to the use of tools and libraries to ease the development of AJAX applications. Graduates will hit the ground running, applying AJAX to projects at both an architectural as well as a line by line coding level. Students who attend this course will leave this course armed with the required skills to design, implement, and deploy robust, flexible, and safe AJAX-based applications.

Asynchronous JavaScript and XML (AJAX) is an approach to developing web applications that is enabling significant changes in the way users interact with web applications. AJAX uses a combination of technologies to deliver more responsive and usable content to browsers. Depending on the configuration, potential technologies used include HTML/XHTML, CSS, JavaScript, DOM, XML, XPath, XSLT, and the XMLHttpRequest object. Ajax is a loosely coupled group of technologies and techniques. As such, there are a wide variety of options, tools, and approaches that can be used in conjunction with the basic Ajax approach. The Dojo toolkit and JSON are two of the more commonly used options and are covered in this course as well.

► Course Objectives: What You'll Learn

This course provides indoctrination in the practical use of the umbrella of technologies that support Ajax as well as some of the tools, toolkits, and frameworks that can be used in conjunction with Ajax development and deployment. The course begins with an initial look at Ajax and how it is used within the context of web applications. The students walk through the different technologies that are the foundation for Ajax. Once the foundations of Ajax have been established, the course looks at the fundamental aspects of Ajax in terms of web applications, security, tools, and frameworks. The transport and processing of data is a significant part of the Ajax picture. The course presents the various options for data interchange and processing.

Working within in a dynamic, hands-on learning environment, guided by our expert team, attendees will learn to:

- Understand what Ajax is and how it is used within the context of web applications

- Work with the different technologies that are the foundation for Ajax.
- Understand and work with the fundamental aspects of Ajax in terms of web applications, security, tools, and frameworks
- Design and implement the transport and processing of data using the various options for data interchange and processing.
- Understand the wide variety of options, tools, and approaches that can be used in conjunction with the basic Ajax approach
- Work with the Dojo toolkit and JSON
- Examine application security, ranging from web and XML application issues to the vulnerabilities and threats that are specific to AJAX

Throughout the course, students will be led through a series of progressively advanced topics, where each topic consists of lecture, group discussion, comprehensive hands-on lab exercises, and lab review. If your team requires more or less advanced materials or custom topics, this course may be easily adjusted to accommodate. We offer many additional advanced classes which may be blended with this course for a track that best suits your development objectives.

► Audience & Pre-requisites: Who Should Attend

This is a **basic level** AJAX training course, designed for those needing an introduction to concepts and technologies associated with AJAX and its related recommendations. Previous experience or working knowledge of HTML and JavaScript is helpful but not essential.

Workshop Topics Covered

Session: Introduction to Ajax

Lesson: Ajax Overview

- Ajax Basics
- The Purpose of Ajax
- Traditional Web Application
- Ajax Web Application

Session: Ajax Foundation

Lesson: XMLHttpRequest Object (XHR) Mechanics

- XMLHttpRequest Object
- Creating an XMLHttpRequest Object
- Creating an XMLHttpRequest Object Mozilla Method
- Creating an XMLHttpRequest Object Internet Explorer Method
- Cross-browser XMLHttpRequest Creation
- Using an XMLHttpRequest Object

- XMLHttpRequest open() Method Arguments
- Request Types
- Request Types: HEAD
- Request Types: GET
- Request Types: POST
- Asynchronous -vs- Synchronous Requests
- Handling the Response
- Values of the readyState Property
- Handling thereadystatechange event

- XMLHttpRequest Object Properties
- XMLHttpRequest Object Methods

Lesson: JavaScript Mechanics

- JavaScript Defined
- Embedding Scripts in HTML
- Identifiers and literals
- Non Standard Operators
- Strings
- JavaScript Object
- JavaScript Literals
- Associative array
- Object Universal Properties
- JavaScript Array
- Arrays
- Array Methods
- Defining JavaScript Functions
- Function
- Functions in JavaScript
- Invoking Functions
- Functions as Data
- Functions as Methods
- Function Constructor
- Function Scope and Closures
- Loop Structures
- Iteration
- Conditional Structures
- Logical
- Return
- Throw
- String Objects
- Working with Arrays
- With
- The with Statement
- Defining Classes
- Function Constructors
- Prototype Property
- Extending Classes
- Extending Classes With Prototype
- JavaScript and JSPs
- JavaScript Event Handling
- Event Models
- Basic Event Handling
- HTML Events
- Handling HTML Events
- Event Handling With Dom Level 2
- DOM 2 Event Propagation: Three Phases
- Event Handler Registration
- InnerHTML
- JavaScript Security Limits Capability
- Same Origin Policy
- Timers Within Browser Windows
- Window and Screen Information
- Opening And Manipulating Windows
- JavaScript Execution: Global Object
- JavaScript Execution: Call Object
- JavaScript Execution Context

- Scope Chain
- JavaScript in Browser Environment
- Window Object – Global Context
- Executing Scripts
- The onload Event Handler
- Window Object As Execution Context
- Threading
- Manipulating Document During Loading

Lesson: Cascading Style Sheets

- Introduction to Cascading Style Sheets
- Applying CSS
- Connecting CSS to Documents
- Style Rules Summary
- Defining Style Rules
- CSS Selectors
- (Simple) Selectors
- Class Selectors
- ID Selectors
- Contextual Selectors
- CSS Properties
- CSS Declarations and Rules
- Grouping / Inheritance
- Comments
- Types of Formatting Elements
- Pseudo-classes and -elements
- Pseudo-elements
- Importing a Style Sheet
- Cascading Order

Lesson: HTML DOM Mechanics

- The HTML Document Object Model (DOM)
- Introduction to Scripting Documents
- DOM Structure
- Structure of a Page in Browser Memory
- Dynamic Document Content
- The HTML DOM
- Accessing Nodes
- Accessing Element Nodes
- getElementByTagName() Code Sample
- getElementByTagName() Code Explanation
- getElementById()
- getElementById() Code Explanation
- Properties for Accessing Element Nodes
- The this Object
- Attaching Events
- Code Explanation
- Attaching Events
- Accessing Attribute Nodes
- Accessing Nodes by Type, Name or Value
- Node Type Constants
- nodeName
- nodeValue
- Accessing Nodes by Class Name
- Prototype's getElementsByClassName()

- Method
- Prototype's getElementsByClassName() Method
- removeChild() Method
- DOM Differences: The Whitespace Problem
- Equalizing the Browser DOMs
- Creating New Nodes
- Methods for Inserting Nodes
- Code Explanation
- Using Node Manipulations
- setAttribute() Method
- Introduction to Forms
- Form Object
- Scripting Form Elements

Lesson: XML DOM Mechanics

- Creating a DOM Document with JavaScript
- W3C Standard Method for Creating a DOM Document
- Populating a DOM with XML
- Properties for Accessing Element Nodes
- Methods for Inserting Nodes
- XML to HTML
- Code Explanation
- Creating an AddChild() Function
- Loading XML Data into an HTML Page
- Receiving XML Responses
- HTML to Process XML
- JavaScript to Process XML
- XML Response Processing
- Handling responseXML

Lesson: JavaScript Applied

- JavaScript
- Ajax-based Quiz as Example
- HTML for Quiz
- JavaScript for Quiz
- Server-side Code for Quiz
- Problem Scenario
- Solution to Latency Problem
- Creating New Objects in JavaScript
- JavaScript Classes
- Creating Multiple Objects
- Prototypes
- Prototyping
- Extending Built-in Objects
- OO Approach to XMLHttpRequest calls
- Reusable, Flexible Classes
- Working With Objects
- Fixing the Ajax Quiz

Session: Ajax Fundamentals

Lesson: Ajax Applications

- Login Form

- HTML for Login Form
- JavaScript for Login Form
- Quick Lookup Form
- HTML for Lookup Form
- JavaScript for Lookup Form
- Server-Side Support for Lookup Form
- Creating a Simple Lookup Form
- Ajax Slideshow
- HTML for Slideshow
- JavaScript for Slideshow
- Improving the Slideshow
- Code Explanation
- Change the HTML to Handle Response
- Changing the JavaScript as Well
- Navigable Tables
- Create Navigable Table Rows

Lesson: Ajax Tools and Frameworks

- JavaScript Frameworks
- Selecting a Framework
- Dojo
- Using Dojo for Ajax
- Request Object Properties
- Using Dojo
- Using Dojo for XMLHttpRequests
- Prototype
- Using Prototype for Ajax
- Ajax.Request() 2nd Parameter Properties
- Syntax of the Ajax.Request() Constructor
- Using Prototype

- Using Prototype for XMLHttpRequests
- Direct Web Remoting (DWR)
- AjaxAnywhere
- Simple Ajax (SAJAX)
- Sarissa

Session: JavaScript Object Notation (JSON)

Lesson: JSON Objects

- JSON Overview
- Arrays
- Objects
- Arrays in Objects
- Objects in Arrays

Lesson: JSON Syntax and Processing

- JSON Syntax
- JSON Parsers
- Sending Data
- HTML: Using JSON
- Server: Using JSON
- JSON vs. XML
- Advantages
- Disadvantages
- Using JSON

Session: XSLT and Ajax

Lesson: XSLT Fundamentals

- XSL Standards Have Evolved

- XPath Describes Locations Within XML
- XSLT is a Rule-Based Transformation Language
- XSL is Oriented Towards Formatting
- XSL Family Working Together
- XSLT Transformation to HTML
- Stylesheets Can Be Linked to an XML Instance
- Processing XSLT
- XPath is Used for Matching and Selecting
- XSLT Templates Specify Output
- XSLT Can Output HTML
- XSLT Uses XPath Expressions Within Templates
- XSLT Walk Through
- XSL Stylesheet is an XML Document

Lesson: XSLT Applied

- XSLT Transformations
- XSLT in the Browser: The XML
- XSLT in the Browser: The XSLT
- XSLT in the Browser: The Output
- XSLT in Internet Explorer
- XSLT in Mozilla FireFox
- Overview of Sarissa
- Code Sample
- Advantages/Disadvantages of XSLT in Ajax
- XSLT Transformations with Sarissa

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