

WEB DEVELOPMENT AND DESIGN

Revised 11/28/2011

/training/etc

The Art of Knowledge.

This Page Intentionally Left Blank

Table of Contents

Ajax - JavaScript and XML.....	1
XML For Programmers.....	2
HTML5.....	3

This Page Intentionally Left Blank

Course Description: This course introduces Ajax and its underlying technologies. XML is introduced as the foundation for XHTML documents. The differences between an HTML and XHTML document are discussed as well as formatting XHTML documents using Cascading Style Sheets (CSS). JavaScript is covered in detail along with its interaction with the W3C DOM for XML and XHTML. Students will learn how all of these technologies come together to form the basis of an Ajax application. The XMLHttpRequestObject will then be studied as a means of communicating with server-side components.

Who Should Attend: This course is intended for developers interested in building a dynamic and interactive web based application.

Prerequisites: Basic knowledge of HTML is required for this course. Prior experience with any programming language is suggested.

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

- Understand the purpose of Ajax and its underlying application model
- Create and manipulate well-formed XML documents
- Understand the differences between an HTML and XHTML document
- Use Cascading Style Sheets to format an XHTML document
- Use JavaScript to develop dynamic web pages
- Understand the W3C DOM and interface with it through the use of JavaScript
- Understand the DOM event model and use it to allow JavaScript to interact with user input
- Use the XMLHttpRequestObject to asynchronously communicate with server-side components
- Handle the response from the XMLHttpRequestObject to dynamically update web pages without the need to refresh the entire document

Course Outline:

Introduction

Introduction to Ajax
Typical Web Application Model
Ajax Application Model
Coding Ajax Applications

Getting Started with XML

Parsing XML
XML Syntax
Elements
Attributes
Comments
Unicode and Character Sets
Character References
Entity References
CDATA Sections
Processing Instructions

HTML/XHTML

Introduction
HTML/XHTML Differences

Cascading Style Sheets

Introduction
CSS Syntax
CSS Property Names and Values
Creating CSS Style Sheets
Grouping Selectors
Pattern Matching Rules
Inheritance

The Core JavaScript Language

Introduction
A Simple XHTML and JavaScript Example
Language Structure
Variables
Numbers
Strings
Booleans
Expressions and Operators
Arithmetic Operators
Comparison and Logical Operators
Operator Precedence
The if Statement
The switch Statement
The while Statement
The for Statement
Nested Loops
The break Statement

The continue Statement
Functions
Local vs. Global Variables

JavaScript Arrays

Introduction
Creating Arrays
Processing Arrays
Array Methods
Associative Arrays

Functions

Introduction
User Defined Functions
Arguments and Parameters
The arguments Array
Core JavaScript Functions
Numerical Functions
URI Encoding and Decoding Functions

Core JavaScript Objects

Objects
The Math Object
The Date Object

The Document Object Model (DOM)

Web Browsers and Parsers
Introduction
The W3C DOM
Trees and Nodes
The Node Interface
The NodeList and NamedNodeMap Interfaces
Node Traversal Example
Node Traversal Display
Node Traversal Details
The Element Interface
The Text and Attr Interfaces
DOM Compatibility
The Document Interface

The DOM Event Model

Introduction
JavaScript Events
Event Handlers as XHTML Attributes
Event Handlers as Properties
Event Propagation
The Event Object
Event Properties and Methods
Cross-Browser Event Handling
Handling Mouse Events

The XMLHttpRequest Object

Introduction
Cross-Browser XMLHttpRequest Object
XMLHttpRequest Properties
XMLHttpRequest Methods
Communicating with the Server
Processing Text Responses
Processing XML Responses
Attributes Named id and of Type ID
Defining a Callback Handler Function
Handling Multiple XMLHttpRequest Objects

A More Complex Ajax Example

Introduction
The XHTML Component
The CSS Component
The Server-Side XML Components
The Utility Components
Building the Application - Stage 1
Building the Application - Stage 2
Building the Application - Stage 3
Building the Application - Stage 4
Building the Application - Stage 5
Building the Application - The Final Stage

Course Description: This comprehensive course teaches you the principles, benefits and components of XML, introduces some advanced principles of XML development and emerging standards such as XSL, XPath, and XML Schemas. The course includes the use of the Java programming language to inspect, modify and create XML documents using the SAX and DOM Interfaces.

Who Should Attend: This course was designed for Programmers and Web developers who want to use the Extensible Markup Language (XML) for creating, transferring and presenting data on the web or between software components.

Prerequisites: Students should have completed a course in Java Programming or have equivalent knowledge, and familiarity with HTML documents.

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

- Recognize all components of an XML document.
- Create XML-compliant markup languages.
- Write both a well-formed and valid document.
- Use namespaces to uniquely identify markup elements amongst the global creation of new documents.
- Understand the components of XML Application Programming Interfaces like DOM and SAX.

Course Outline:

Introduction

History
What is a Markup Language?
SGML - Standard Generalized Markup Language
HTML - Hypertext Markup Language
Sample HTML document
XML - Extensible Markup Language
XML Vocabularies
Creating Semantic Tags

Getting Started With XML

XML Syntax
Elements
Attributes
Comments
Unicode and Character Sets
Character References
Entity References
Character Data Sections (CDATA)
Processing Instructions
Parsing XML

Document Type Definitions

Introduction to DTDs
Element Type Declarations
Cardinality Summary
Attribute Type Declarations
String Attribute Type Declarations
Attribute Default Specifications
Enumerated Attribute Type Declarations
ID Attribute Type Declarations
IDREF and IDREFS Attribute Type Declarations
NMTOKEN Attribute Type Declarations
Entity Type Declarations
Entity Declarations
ENTITY Attribute Type Declarations
NOTATION Attribute Type Declarations

Cascading Style Sheets Level 2 (CSS2)

What is a CSS?
Creating CSS2 Stylesheets
Selecting Elements
Pattern Matching
STYLE Attributes
Inheritance
Cascades
Multiple Stylesheets
Comments
Property Names and Values

XML Stylesheet Language (XSL)

What is XSL?
What is XSLT?
Using XSLT
XSL Syntax
Namespaces

Trees and Nodes
Associating Documents With Stylesheets
XSL Stylesheet Element
XSL Template Elements
Accessing Node Values
XSL Apply-Templates Element
XSLT Match Patterns
Expressions as Tests in Patterns
Matching by ID
XSL If Element
XSL Choose Element
XSL For-Each Element
XSL Sort Element
XSL Comment Element
Miscellaneous

XLink
Xpointer

XML Schema

Introduction to XML Schemas
XML Schema Syntax
Simple Types
Built-in Primitive Simple Types
Built-in Derived Simple Types
Datatype Hierarchy
Using Built-In Datatypes
Defining Your Own Simple Types
Facets
List Types
Union Types
Complex Types
Global vs. Local Elements and Attributes
Complex Types with Simple Content
Complex Types with Mixed Content
Complex Types with No Content and Any Content
Annotations

Document Object Model (DOM)

What are Parsers?
JAXP - A Plugability Layer
Parsing with DOM
Trees and Nodes
DOM Node Types
Processing Child Nodes
Error Handling
Building the Node Tree

SAX API

Parsing with SAX
Event Handling in SAX
ContentHandler Interface
Attributes Interface
DTDHandler Interface
EntityResolver Interface
ErrorHandler Interface
SAXParseException Class

Future XML Capabilities

Course Description: Students will learn about HTML5 and how to incorporate its features in web pages and applications. They will learn the basics as well as advanced topics like layouts, forms, offline support, geolocation, audio and video, graphics, communication APIs, storage, and new JavaScript web-workers.

Who Should Attend: This course is intended for experienced HTML developers with some JavaScript experience.

Prerequisites: Students must be experienced with HTML and have experience with CSS and JavaScript. Prior knowledge of JSON, DOM, and Ajax is helpful, but not required.

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

- Build HTML5 pages
- Understand the major benefits of HTML5
- Understand the difference between HTML5 and HTML 4
- Use the new elements and attributes of HTML5
- Work with audio and video in HTML5
- Work with new Canvas element to create code-based drawings in HTML5
- Use Web Storage for offline applications
- Use all of the new HTML5 form elements
- Understand the current state of browser support for HTML5 and how to make your HTML5 sites degrade gracefully

Course Outline:

Introduction

Laying out a Page with HTML5

Page Structure
New HTML5 Structural Tags
Page Simplification

HTML5 - How We Got Here

The Problems HTML 4 Addresses
The Problems XHTML Addresses
The New More Flexible Approach of HTML5 - Paving the Cowpaths
New Features of HTML5
The HTML5 Spec(s)
Current State of Browser Support

Sections and Articles

The section Tag
The article Tag
Outlining
Accessibility

HTML5 Audio and Video

Supported Media Types
The audio Element
The video Element
Accessibility
Scripting Media Elements
Dealing with Non-Supporting Browsers

HTML5 Forms

Modernizr
New Input Types

HTML5 New Form Attributes

autocomplete
novalidate

HTML5 New Form Field Attributes

required
placeholder
autofocus
autocomplete
form
pattern

New Form Elements

datalist
progress and meter

HTML5 Web Storage

Overview of HTML5 Web Storage
Web Storage
Other Storage Methods

HTML5 Canvas

Getting Started with Canvas
Drawing Lines
Color and Transparency
Rectangles

Circles and Arcs
Quadratic and Bezier Curves
Images
Text

Integrated APIs

Offline Application API
Drag and Drop API