



# Metropolitan College

## Computer Science Department

### Web Technologies and Languages (CS601)

#### Objectives

This course is a complete immersion into XHTML, CSS and JavaScript. Together, these technologies constitute what is called "DHTML" or Dynamic HTML. The older HTML specifications, such as HTML 4.01, will be discussed to only to compare elements and attributes that are now deprecated.

The course focuses on XHTML 1.1, Cascading Style Sheets (Level 1 and 2), with an emphasis on using XHTML 1.1 DTD. The course focus aims to use the latest standards with modern browsers: IE 7, Mozilla 1.7.x-based browsers (Firefox 2.0), Safari 3.0; and avoid the use of deprecated elements and attributes found in earlier browsers, such as Internet Explorer 5.0 and Netscape 4.x through 6.x.

We will explore all the elements within the XHTML 1.1, 2nd Edition specification (<http://www.w3.org/TR/xhtml11>).

We will be learning the XHTML language and how to correctly utilize it throughout the course. Following that, we will study Cascading Style Sheets, or "CSS" (<http://www.w3.org/TR/REC-CSS2>) as a way to present your markup, in both a static and dynamic manner.

Students familiar with any server-side language; such as Java, ASP.Net 3.0/3.5 or Ruby on Rails (RoR), will be allowed to use it. However, if you are strong in one language, consider trying a new one out!

*This course will present PHP 5.0 at the very onset of the course. Students will be expected to become proficient enough with the PHP language to create a fully-functional website, regardless of other server-side languages a student may already know.*

Most e-commerce sites employ the use of a Relational Database Management System as part of the system architecture. We will survey basic RDMS and ANSI/SQL concepts (using MySQL 5.0).

We will also learn one RIA technology in this class - Adobe Flex 3. We will be using the Adobe Flex Builder.

#### Course Prerequisites

The only prerequisites to this course are introductory programming classes in either C/C++ or Java.

Students should (*!really ought to..*) to bring their laptop to every class; as we will have in-class assignments and laboratories. You will be writing HTML using pen and paper if you don't have a laptop for the class. So, please - bring your laptop...and power supply. (You might think about an extension or power strip, as many classrooms only have a few in-wall plugs.)

## Course and Instructor

- **instructor:** Andrew Sheehan
- **location:** Tyngsboro Campus (See Monitors at building entrances for the room assignment)
- **course details:** Monday Nights, 6:00 PM to 9:00 PM
- **email:** asheehan@bu.edu
- **office hours:** before, during or after class.

## Course book

The required books are:

The books may be purchased at any Internet bookseller; such as [BookPool.com \(\\$24.95\)](#), [Amazon.com \(\\$26.49\)](#), [bn.com \(\\$39.99\)](#) or the University Bookstore.

- *Beginning JavaScript Development With DOM Scripting and Ajax: From Novice to Professional* APress. July, 2006. [ISBN10: 1-59059-680-3]

[Link to APress.com's website for this book](#)

- *Beginning PHP and MySQL: From Novice to Professional* APress. Mar, 2008. [ISBN10: 1-59059-862-8]

[Link to APress.com's website for this book](#)

## Course Format

The course will consist of lectures, assignments, quizzes and examinations. In addition, various online references will be used for each lecture. Powerpoint slides and in-class code laboratories will be used to solidify important topics and strengthen the students absorption of the course material.

## Grading Policies

Your final grade will be calculated by the following percentages:

Graded Homework: 20.00%

Quizzes: 10.00%

Closed-book/No Internet Access Midterm: 40.00%

Closed-book/No Internet Access Final: 30.00%

*Please be aware of the following policies:*

- *Students will be expected to hand in assignments prior to the start of class to my [asheehan@bu.edu](mailto:asheehan@bu.edu) email account. If students want to bring in their homework to class on a memory stick, that is fine.*

*Once I hand out the solutions to the homework, quiz or laboratory assignments, you will not receive a grade.*

- *Quizzes, homework and laboratories will not be made up if the student misses the class or its submission deadline.*

## Course Schedule and Lecture Topics (Subject to Change)

Class 1

## Course Schedule and Lecture Topics (*Subject to Change*)

**How to write XHTML Documents (tools you would use). We will cover non-deprecated XHTML elements.**

- Inline elements - what are they, and what should not be used.
- Block elements - how they are used and why they act as they do.
- Install and configure PHP on your laptop or computer. You may consider using [XAMPP](#) for a one-stop program to do all your required software and systems at one time.

In our first class, we will talk about the core XHTML elements; their proper useage, attributes and then have hands-on laboratories using them.

**Here are the reading assignments:**

1. Chapters 1 and 2 of "*Beginning PHP and MySQL: From Novice to Professional*"
2. Chapter 1 of "*Beginning JavaScript Development with DOM Scripting and Ajax: From Novice to Professional*"
3. <http://www.isoc.org/internet/history/brief.shtml>
4. [http://www.w3schools.com/html/html\\_intro.asp](http://www.w3schools.com/html/html_intro.asp)
5. <http://www.developer.com/lang/php/article.php/900521> (Installing PHP article)

### Class 2

**We will cover all the nuances regarding tables and forms; including:**

- Multiple header rows and columns
- Embedding tables within tables
- Using the <thead>, <tfoot> and the <tbody> collection elements.
- XHTML forms and its related elements.
- Important attributes (in both tables, forms and form elements)

**We will explore the methodologies that employ the proper use of columns and rows using tables. Additionally, we will talk about the question of how not to use tables when designing or marking up XHTML Documents.**

Continuing with PHP, we will cover how to connect to a database, query for records (data) and build an XHTML table dynamically.

Please install MySQL 5.x on your laptop or workstation before or during this weeks' presentation. We will cover the basics of modern Relational Database Systems, with a focus on Sun Microsystems MySQL Community Server, version 5.0

**Here are the reading assignments:**

1. Chapters 26, 27, 28 and 30 of "*Beginning PHP and MySQL: From Novice to Professional*"
2. [http://www.w3schools.com/tags/tag\\_table.asp](http://www.w3schools.com/tags/tag_table.asp)
3. <http://davespicks.com/essays/notables.html>
4. [http://www.stopdesign.com/articles/throwing\\_tables](http://www.stopdesign.com/articles/throwing_tables)
5. <http://www.imaputz.com/cssStuff/bigFourVersion.html>
6. [http://www.w3schools.com/html/html\\_forms.asp](http://www.w3schools.com/html/html_forms.asp)
7. <http://www.mountaindragon.com/html/forms.htm>

### Class 3

## Course Schedule and Lecture Topics (*Subject to Change*)

### ***Cascading Style Sheets***

In this lecture, we will cover the incredible power CSS (Level 1 and Level 2). We will cover topics such as:

- Types: external, embedded and inline
- CSS Properties, Selectors and Rules
- Using float and display
- Pseudo elements/classes
- Creating 2-column and 3-column layouts without use of <table>'s

**Here are the reading assignments:**

1. <http://www.w3schools.com/css/default.asp>
2. <http://www.echoecho.com/css.htm>
3. <http://htmlhelp.com/reference/css>
4. <http://www.csstutorial.net>
5. <http://www.w3.org/Style/CSS/>
6. <http://reference.sitepoint.com/css>

### Class 4

### ***Introduction to JavaScript and PHP***

- Expressions
- Control Structures
- Literals and Variables
- Operators
- Basics (Comments, whitespace, use of semi colons, etc...)

**Here are the reading assignments:**

1. Chapter 3 of "*Beginning PHP and MySQL: From Novice to Professional*"
2. <http://www.w3schools.com/js/default.asp>
3. <http://www.webteacher.com/javascript>
4. <http://www.cs.brown.edu/courses/bridge/1998/res/javascript/javascript-tutorial.html>
5. [http://www.webdeveloper.com/javascript/javascript\\_js\\_tutorial.html](http://www.webdeveloper.com/javascript/javascript_js_tutorial.html)
6. <http://www.webmonkey.com/programming/javascript/tutorials/tutorial1.html>

### Class 5

### ***Javascript and PHP: Functions, Arrays and Objects***

- Built-in PHP functions (libraries) and Core Javascript functions (window, document)
- Programmer-defined functions.
- Invoking and creating functions in PHP and Javascript
- Using function parameters, returning values from functions
- Scope in Javascript and PHP
- Creating and using Arrays in PHP and Javascript
- Javascript Object Literals

**We will work through several labs declaring arrays and using functions using both Javascript and PHP in this class.**

## Course Schedule and Lecture Topics (*Subject to Change*)

Here are the reading assignments:

1. Chapters 4, 5 and 6 of "*Beginning PHP and MySQL: From Novice to Professional*"
2. <http://www.javascriptkit.com/jsref/arrays.shtml>
3. <http://www.webmonkey.com/webmonkey/98/04/index1a.html>
4. <http://www.sitepoint.com/article/oriented-programming-1>
5. [http://www.w3schools.com/js/js\\_functions.asp](http://www.w3schools.com/js/js_functions.asp)
6. [http://tinf2.vub.ac.be/~dvermeir/java/java\\_script/model.html](http://tinf2.vub.ac.be/~dvermeir/java/java_script/model.html)
7. <http://www.devarticles.com/c/a/JavaScript/JavaScript-Arrays/>
8. <http://www.tizag.com/javascriptT/javascriptfunction.php>
9. [http://www.hunlock.com/blogs/Mastering\\_Javascript\\_Arrays](http://www.hunlock.com/blogs/Mastering_Javascript_Arrays)

Class 6 *Held on Tuesday, not Monday (Columbus Day)*

### **The DOM, Events and Dynamic HTML**

- Built-in Objects (Math, String, Date..)
- Events and using Event Handlers
- Using Prototype Open Source JavaScript Library (<http://www.prototypejs.org>)

We will work through several labs declaring arrays and using functions in this class.

Here are the reading assignments:

1. <http://www.devx.com/projectcool/Article/19993>
2. [http://www.webreference.com/javascript/reference/core\\_ref/contents.html](http://www.webreference.com/javascript/reference/core_ref/contents.html)
3. [http://developer.mozilla.org/en/docs/Core\\_JavaScript\\_1.5\\_Reference](http://developer.mozilla.org/en/docs/Core_JavaScript_1.5_Reference)
4. <http://msdn2.microsoft.com/en-us/library/ms533050%28vs.85%29.aspx>
5. <http://www.w3.org/TR/html4/interact/scripts.html>

### Class 7 - MIDTERM EXAMINATION

Class 8

### **Introduction to Ajax - Dynamic HTML with CSS**

- The history of Ajax and related technologies
- Using Prototype's Ajax API with Dynamic CSS (with Prototype)
- Home-grown Ajax - the basics

Here are the reading assignments:

1. Chapter 8 of "*Beginning JavaScript Development with DOM Scripting and Ajax: From Novice to Professional*"
2. [http://msdn2.microsoft.com/en-us/library/ms533051\(VS.85\).aspx](http://msdn2.microsoft.com/en-us/library/ms533051(VS.85).aspx)
3. [http://www.w3schools.com/jsref/jsref\\_events.asp](http://www.w3schools.com/jsref/jsref_events.asp)
4. <http://www.quirksmode.org/js/introevents.html>
5. <http://www.comptechdoc.org/independent/web/cgi/javamanual/javaevents.html>
6. <http://www.ibm.com/developerworks/web/library/wa-ajaxintro1.html>
7. <http://www.peachpit.com/articles/article.aspx?p=425820&rl=1>
8. [http://blog.joshuaeichorn.com/slides/Introduction-To-HTML\\_AJAX/](http://blog.joshuaeichorn.com/slides/Introduction-To-HTML_AJAX/)
9. <http://www.prototypejs.org/learn>

## Course Schedule and Lecture Topics (*Subject to Change*)

### Class 9

#### ***Open Source Libraries: jQuery, Mootools, Prototype and OpenRico***

Several open source libraries exist for today's web developer. Aside from the one mentioned above, there are several more to explore and use. In essence, these components raise the overall experience for your Internet clients. In this class, we will explore each of these and work through several assignments in-class.

1. Animation Effects
2. DOM manipulation made easy
3. Custom controls (Trees, Sliders, Grids...)
4. Web 2.0 Pop-up windows and tooltips

#### **Here are the reading assignments:**

1. Chapters 6, 7, 9 and 10 of "*Beginning JavaScript Development with DOM Scripting and Ajax: From Novice to Professional*"
2. <http://jquery.com>
3. <http://mootools.net>
4. <http://openrico.org>
5. <http://www.prototypejs.org>

### Class 10

#### ***Introduction to Rich Internet Applications with Flex 3***

- What are Rich Internet Applications
- Comparing other RIA technologies and abilities (OO Javascript - OpenRico, jQuery, mootools, etc)
- Differences between traditional web applications and Flex applications
- Creating a simple Flex Application
- The Box Model
- Understanding MXML syntax and structure

With Web users expecting richer and more complex interfaces, Rich Internet Applications (RIAs) are seeing a huge increase in popularity. Adobe Flex is the tool of choice for many web developers when it comes to building RIAs. [sitepoint]

We will work through several labs focused on the fundamentals of Flex 3.

#### **Here are the reading assignments:**

1. <http://www.sitepoint.com/article/beginners-tutorial-flex-3>

### Class 11

#### ***Handling Events and Layouts in Flex 3***

- Understanding Events
- Using and Creating Event Handlers with ActionScript 3.0
- Using `addEventListener()` and `removeEventListener()`
- Absolute and Constraint-based positioning

#### **Here are the reading assignments:**

1. <http://www.adobe.com/devnet/flex/>

## Course Schedule and Lecture Topics (*Subject to Change*)

2. <http://www.adobe.com>

### Class 12

#### ***Using view states, ViewStacks and Data Binding (with WebServices) in your application***

- Understanding States and ViewStacks
- When not to use States
- Controlling each State
- Adding and Removing components
- Using Forms and FormItems
- Working with Data Communication in Flex 3
- Validating data
- Data Binding

We will work through several laboratories with Flex Builder 3.0 when working with States and ViewStacks

#### **Here are the reading assignments:**

1. <http://www.nodans.com/index.cfm/2008/1/14/So-you-wanna-build-a-Flex-application--Part-5--States--ViewStacks-and-Getters>
2. <http://livedocs.adobe.com/flex/3/langref/mx/containers/ViewStack.html>

### Class 13

#### ***Review for the Final Examination and have our Project Presentations***

We will wrap up, do our project presentations and have our review.

### Class 14 - FINAL EXAMINATION