

CS 312

Internet Concepts

Developing Web Content: Basic HTML

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Overview

- ◆ HTML vs. XHTML
- ◆ XHTML Basics
- ◆ Building Webpages on ODU-CS Systems
- ◆ Common HTML Tags
- ◆ Links
- ◆ Lists
- ◆ Images
- ◆ Fonts/Colors
- ◆ Common Mistakes
- ◆ Tables

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HTML

◆ HyperText Markup Language

- » language used to format webpages
- » markup language – describes formatting rather than function
- » *not a programming language!*

◆ Online references/tutorials

- » <http://www.w3.org/MarkUp/#tutorials>
- » <http://www.htmlcodetutorial.com/>
- » http://www.w3schools.com/html/html_intro.asp

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XHTML

◆ eXtensible Hypertext Markup Language

- » successor to HTML, but is a parallel and separate standard
- » a stricter and cleaner version of HTML
- » is designed to replace HTML
- » hybrid between HTML and XML

◆ Online reference/tutorial

- » http://www.w3schools.com/XHTML/xhtml_html.asp

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Why XHTML and Not HTML?

- ◆ Web browsers developed to allow sloppy HTML and forgive coding errors
 - » problem for new devices like PDAs and smart phones – not as much processing power as a PC
- ◆ Browsers (think IE) were developed to support proprietary extensions to HTML
 - » result: non-standard HTML pages
- ◆ HTML was not designed to format pages for multiple platforms
 - » again, think PDAs and smart phones

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XHTML Basics

- ◆ XHTML was designed to give a foundation for a device-independent Web
- ◆ All XHTML documents must be *well-formed*
 - » obeys syntax rules
- ◆ XHTML documents should begin with an XML declaration:

→ `<?xml version="1.0" encoding="UTF-8"?>`

- » document based on XML 1.0 standard
- » character encoding is Unicode (UTF-8) using 8 bytes per character

first line in each XHTML document you write

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XHTML Basics

Document Type Definition (DTD)

- ◆ Three types of XHTML

- » XHTML 1.0 Transitional

- ❖ least strict specification, allows CSS and traditional formatting instructions such as fonts

- » XHTML 1.0 Strict


- ❖ requires CSS, does not allow traditional formatting

- » XHTML 1.0 Frameset

- ❖ required for pages using XHTML framesets

- ◆ Version listed in the DTD (or DOCTYPE) tag

- » placed at the top of the document



```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0  
Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/  
xhtml1-transitional.dtd">
```

second line in each XHTML document you write

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XHTML Basics

XML Namespace

- ◆ Each document begins with the <html> tag

- ◆ For XHTML, we need to specify the XML namespace (xmlns)

- ◆ The standard we'll use is given at

<http://www.w3.org/1999/xhtml>



```
<html xmlns="http://www.w3.org/1999/xhtml">
```

third line in each XHTML document you write

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Basic Format of an HTML Page

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML
  1.0 Transitional//EN" "http://
  www.w3.org/TR/xhtml1/DTD/xhtml1-
  transitional.dtd">
<html xmlns="http://www.w3.org/1999/
  xhtml">
<head>
...header information goes here...
</head>
<body>
...body information goes here...
</body>
</html>
```

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Getting Started

Where to Store HTML Files @ cs.odu.edu

- ◆ Create a directory called public_html in your home directory
 - » ~/public_html/
- ◆ Make subdirectories under ~/public_html as needed
 - » mkdir ~/public_html/cs312
 - » chmod 755 ~/public_html/cs312/
- ◆ Normally, you can set subdirectories and executable files with access mode 755 and files with 644
 - » 755 - **owner** (you!) can read/write/execute; **group** and **world** (everyone else) can read/execute, but not write
 - » 644 – **owner** (you!) can read/write; **group** and **world** (everyone else) can read, but not write

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Google Analytics

- ◆ <http://www.google.com/analytics>
 - » copy and paste some code into your webpage

- ◆ Allows you to track how people find your website
 - » search engine (what keywords searched for)
 - » directly typed in URL
 - » linked from another page

- ◆ Allows you to track what people did on your website
 - » what pages visited
 - » how long pages were viewed

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First HTML Page

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0
  Transitional//EN" "http://www.w3.org/TR/
  xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<title>My First Web Page</title>
</head>
<body>
Hello world!
</body>
</html>
```

File saved at ~/public_html/cs312/html/firstPage.html
<http://www.cs.odu.edu/~mweigle/cs312/html/firstPage.html>

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Validating XHTML

- ◆ W3C Validator
 - » <http://validator.w3.org/>
- ◆ Your HTML assignments will be tested using this validator against XHTML 1.0 Transitional
 - » so, validate your pages before submitting them!
 - » plus, it helps with debugging if you run into problems

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HTML Tags

- ◆ `<tagName>`
 - » Opening tag – some type of command or formatting
- ◆ `</tagName>`
 - » Closing tag – ends the formatting
- ◆ `<html>`
 - » Indicates start of an HTML document
- ◆ `</html>`
 - » Indicates end of the HTML document
- ◆ `<head>` and `</head>`
 - » Header information (not displayed in the browser window)
- ◆ `<title>` and `</title>`
 - » The title is displayed in your browser's caption (title bar)

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HTML Tags

- ◆ The text between the `<body>` tags is the text that will be displayed in your browser
- ◆ XHTML is case sensitive. All tags must be lowercase.
- ◆ All tags must have closing tags

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Common Formatting Tags

- ◆ Headings are defined with the `<h1>` to `<h6>` tags
 - » `<h1>` defines the largest heading
 - » `<h6>` defines the smallest heading
 - » Each heading must have closing tag
- ◆ **Bold** is defined with the `` tag
 - » `` closing tag
- ◆ *Italics* is defined with the `` tag
 - » `` closing tag

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HTML Paragraphs

- ◆ Paragraphs are defined with the `<p>` tag:
`<p>This is a paragraph</p>`
`<p>This is another paragraph</p>`
 - » HTML automatically adds an extra blank line before and after a paragraph

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HTML Line Breaks

- ◆ A line break in your HTML source file does not translate to a line break on the webpage.
- ◆ `
`
 - » This tag has no closing tag (*self-contained tag*)
 - » The `
` tag forces a line break wherever you place it`<p>This
 is a para
graph with line breaks</p>`

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HTML Spacing

- ◆ More than one space between words has no effect in HTML
- ◆ ` ` creates a blank space
- ◆ Centering is done with the `<center>` tag
» and `</center>` closing tag

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HTML Comments

- ◆ Like good programs, complex webpages should contain comments.

```
<!-- This is a comment -->
```
- ◆ Like regular comments, these are not processed by the web client, but are just for the reader of the source code.

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Special Characters

- ◆ & is a control character in HTML (ex:)
 - » to display &, use &
- ◆ Likewise, < and > have special meanings in HTML
 - » to display <, use <
 - » to display >, use >
- ◆ List of special characters
 - » <http://www.coolnerds.com/HTML/htmlchar.htm>

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Tag Attributes

- ◆ Attributes provide additional information to an HTML element
 - » name/value pairs like this:
name="value"
 - » Attribute values should always be enclosed in quotes
- ◆ Examples:
 - » <h1 align="center"> This is a center heading</h1>
 - ❖ has additional information about the alignment (says the header is supposed to be centered)
 - » <body bgcolor="yellow">
 - ❖ Makes the page background yellow
- ◆ *Many HTML tag attributes will be accepted with XHTML 1.0 Transitional, but their use is deprecated*

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Example Time

◆ Formatting Example:

<http://www.cs.odu.edu/~mweigle/cs312/html/formatting.html>

- » Headings
- » Paragraphs
- » Line Breaks
- » Spacing
- » Centering
- » Special Characters (&)
- » Tag Attributes (centering, background color)

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In-Class Exercises

◆ What will the following HTML code produce?

```
<!-- ODU Football -->  
<p><strong>ODU Football Schedule</strong></p>  
<em>Oct 23</em> - Georgia State<br /><em>Oct 30</em> - Hampton
```

◆ Is the following code valid XHTML? If not, what are the errors?

```
<p><strong><Em>ODU Basketball Schedule</strong></em>  
11/19 - St. Peter's  
<br/>12/01 - Richmond
```

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Links

The “Real” Reason for Webpages

- ◆ `Text to be displayed`
 - » opens the page in the current window/tab
- ◆ `Text to be displayed in a new window`
 - » opens the page in a new window
- ◆ `Text to be displayed`
 - » title is displayed when mouse hovers over link in browser (browser-dependent)

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Absolute vs. Relative Links

- ◆ *Absolute* links will take you to a page regardless of where the source anchor is located
 - » Example: <http://www.espn.com> takes you to the same place no matter where your anchor is located
 - » Must include “http://” or it will be interpreted as relative
- ◆ *Relative* links reference something on your local site
 - » Example: `` references some page `myLink.html` that exists in the same directory as the source page

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More Relative Links

- ◆ You have a folder containing pages “basePage.html” and “refPage.html”, and a subfolder “myFolder”
 - » The subfolder contains “mySubPage.html”
- ◆ From basePage.html, you can reference refPage.html as ``
 - » And you reference mySubPage.html from basePage.html as
``
- ◆ Links Example:
 - » <http://www.cs.odu.edu/~mweigle/cs312/html/links.html>

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Lists in HTML

- ◆ Unordered (bulleted) list
 - » surrounded by the ` ... ` tags
 - ❖ unordered list
 - » each element surrounded by the ` ... ` tag
 - ❖ list item
- ◆ Numbered list
 - » surrounded by the ` ... ` tags
 - ❖ ordered list
 - » each element surrounded by the ` ... ` tag

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List Examples

<code></code>	• first list item
<code>first list item</code>	• second list item
<code>second list item</code>	
<code></code>	

<code></code>	
<code>first item</code>	1. first item
<code>second item</code>	2. second item
<code></code>	

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Ordered List Attributes

- ◆ *type* attribute for ordered lists
 - » 1 – numerals (default)
 - » A – uppercase letters
 - » a – lowercase letters
 - » I – Roman numerals
 - » i – lowercase Roman numerals

<code><ol type="A"></code>	A. first item
<code>first item</code>	B. second item
<code>second item</code>	
<code></code>	

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Nested Lists

- ◆ Using ` ... ` or ` ... ` inside a list creates a level of indentation

```
<ul>
  <li>first item
    <ol>
      <li>first subitem</li>
      <li>second subitem</li>
    </ol></li>
</ul>
```

Note that the `` is part of the first list item

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Definition Lists

- ◆ Surrounded by `<dl> ... </dl>` tags
 - » “title” is surrounded by `<dt>...</dt>` tags
 - » “definition” is surrounded by `<dd>...</dd>` tags

- ◆ Example:

```
<dl>
  <dt>URL</dt>
  <dd>Uniform Resource Locator</dd>
</dl>
```

- ◆ Lists Example:

- » <http://www.cs.odu.edu/~mweigle/cs312/html/lists.html>

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In-Class Exercises

- ◆ What will the following HTML code produce?

```
<h1>ODU Football Schedule</h1>
<ul>
<li>Oct 23 - <a href="http://www.gsu.edu">Georgia State</a></li>
<li>Oct 30 - Hampton</li>
</ul>
```

- ◆ Is the following code valid XHTML? If not, what are the errors?

```
<h1>ODU Basketball Schedule</H1>
11/19 - <a href=http://www.spc.edu>St. Peter's</a>
<br/>12/01 - <a href="richmond.edu">Richmond</a>
```

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Adding Images

- ◆ Use self-contained `` tag
- ◆ *src* and *alt* are required attributes
 - » *src* – location of image file
 - » *alt* – alternate text (if image can't be displayed)
- ◆ Example:

```

```
- ◆ Setting the size:

```

```

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Adding Images

- ◆ Setting a background picture:

```
<body background="background.jpg">
```

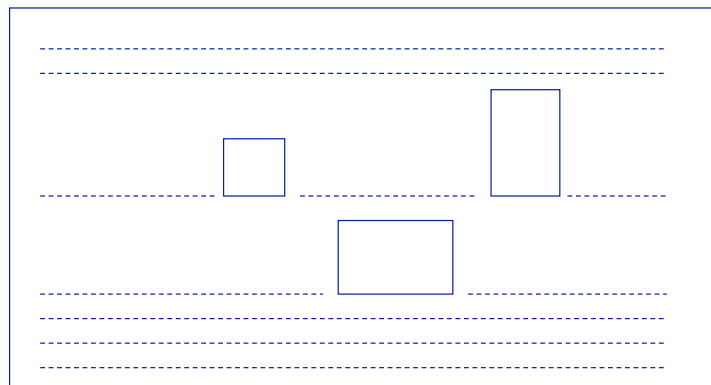
- ◆ Image as link:

```
<a href="lastpage.html">  
  
</a>
```

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More on Images

- ◆ Image location URLs can be absolute or relative, just like other URLs
- ◆ Images can be located anywhere text can



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Aligning Images

- ◆ An image can be aligned either to the left or to the right of a page margin. Text will wrap around them.

``

- ◆ Images can also be enclosed in `<center>` tags to center them on the page.

<http://www.cs.odu.edu/~mweigle/cs312/html/images.html>

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Miscellaneous Tags

- ◆ In the `<head>` section
 - » Meta data for search engines
 - » `<meta name="keywords" content="database, computer science, internet">`
 - » `<meta content="Dr. Michele Weigle" name="author">`

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Common Mistakes

- ◆ Missing an opening tag or closing tag
- ◆ Crossing pairs of opening and closing tags
- ◆ Typing < as >, or vice versa
- ◆ Missing a closing double quote for some parameter value
- ◆ Forgetting to set permissions on newly created files and directories
 - » `chmod 644 filename`
 - » `chmod 755 directory_name`

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HTML Tables

- ◆ Allow neat information organization in columns and rows, presented in cells
- ◆ Border and divider lines are optional and in choices of width in pixels
- ◆ May have colored background
 - » for cells or whole table
- ◆ If size is based on pixel count, then a table's shape is unchanged no matter how the browser is resized.

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Table Cells

- ◆ Each item in a table is placed into a *cell*
- ◆ A cell's width specified by either
 - » number of pixels
 - » percentage of the table width
- ◆ If not specified, a cell's dimension is dynamically determined based on the content in the cell
 - » all items in the same column are of the same width
 - » the widest item determines the column width
 - » an item is as narrow as it is allowed to be
- ◆ A cell's height is determined in the same way as width

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Table Cells

- ◆ When improperly specified, different browsers may treat the table in different ways
 - » to interpret and display in their respective best possible ways
- ◆ When either or both of the width and height are specified, resizing the font by user may cause display problems
- ◆ Unless specified, final cell dimensions are generally based on the data in the entire table

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Features of Table Cells

- ◆ Individual colored background
- ◆ Individual content alignment
- ◆ Allow better controlled image display in a page
 - » Example: row of pictures with captions in row below

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Specifying Tables in HTML

- ◆ Tables are defined with the `<table>` tag
- ◆ Rows are defined with `<tr>`
- ◆ Cells are defined with `<td>`
- ◆ Headings are defined with `<th>`

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Table Example

```
<table border="1">
<tr>
<td>row 1, cell 1</td>
<td>row 1, cell 2</td> </tr>
<tr>
<td>row 2, cell 1</td>
<td>row 2, cell 2</td> </tr>
</table>
```

<http://www.cs.odu.edu/~mweigle/cs312/html/table.html>

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Example with Headings

```
<table border="1">
<tr>
<th>Heading</th>
<th>Another Heading</th> </tr>
<tr>
<td>row 1, cell 1</td>
<td>row 1, cell 2</td> </tr>
<tr>
<td>row 2, cell 1</td>
<td>row 2, cell 2</td> </tr>
</table>
```

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Blank Cell

```
<table border="1">
<tr>
<td>row 1, cell 1</td>
<td>row 1, cell 2</td> </tr>
<tr>
<td>row 2, cell 1</td>
<td></td> </tr>
</table>
```

Note: Some browsers will display the empty cell differently if it contains rather than nothing (or just spaces).

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Table Attributes

- ◆ border
 - » default is no border (or border = "0")
- ◆ cellpadding
 - » amount of space between the contents of the cell and the cell wall, default is 1
- ◆ cellspacing
 - » defines the space between cells, default is usually 2
- ◆ width
 - » width of table defined in pixels (width="300") or percentage of the browser window (width="75%")
 - » if defined in percentage, resizing window resizes the table

<http://www.cs.odu.edu/~mweigle/cs312/html/table-attr.html>

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Multiple Rows/Columns

- ◆ colspan
 - » defines a cell to be a certain number of columns across
- ◆ rowspan
 - » defines a cell to be a certain number of rows high
- ◆ Both are defined as attributes of the cell
 - » either in <td> or <th>

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Color, Captions, and Cell Width

- ◆ bgcolor
 - » can be used as attribute for <table> or <td>
- ◆ caption
 - » specified by <caption> ... </caption> tags inside the table
 - » must right after <table> in XHTML
 - » can use align attribute (bottom, top, left, right)
- ◆ cell width / height
 - » attribute of <td> and <th>
 - » either in pixels or percentage of table width

<http://www.cs.odu.edu/~mweigle/cs312/html/table-fancy.html>

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Nested Tables

- ◆ Tables within tables
- ◆ Any cell can be another table

```
<table border="1">
<tr><td>cell 1</td>
<td>cell 2</td></tr>
<tr>
<td><table><tr>
    <td>subcell 1</td>
    <td>subcell 2</td></tr>
<tr><td>subcell 3</td>
    <td>subcell 4</td></tr>
</table></td>
<td>cell 3</td></tr>
</table>
```

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In-Class Exercise

- ◆ Write the HTML needed to create the following table:

Date	Opponent	Time
Oct 23	Georgia State	3:30pm
Oct 30	at Hampton	1pm

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Overview

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- ◆ Lists
- ◆ Adding Images
- ◆ Fonts/Colors
- ◆ Common Mistakes
- ◆ Tables

Next: Images, Colors, and Image Maps
