Course Home Page:

http://www.rit.edu/~meseec/eecc200-fall2000

- Importance of computer networks and applications.
- A brief history overview of the Internet.
- Introduction to the language of the Web: HTML
  - Basic document structure.
  - Important HTML tags.
  - Examples.
- How to put your home page files on Grace.
- Assignment: Create your own WWW home page, due 11/1.
Computer Networks

• A computer network is an interconnected collection of computers able to exchange information.

• A computer network usually require users to:
  – Explicitly login onto one machine,
  – Explicitly submit information requests to remote computers,
  – Explicitly move files/data around the network.
Motivation for Computer Network Applications

• Motivation for business network applications:
  – Resource sharing: Data, programs, equipment are available to users regardless of their physical location.
  – High reliability: Files and databases could be duplicated on multiple machines. Multiple CPUs prevent total system loss.
  – Economically sound: Networked micro computers using the client-server model offer better price/performance ratio than mainframes.

• Motivation for personal network applications:
  – Access to remote information: Financial information, database access, the Web, newsgroups.
  – Person to person communication: Email, voice, videoconferencing.
  – Interactive entertainment: Video on demand, interactive TV, and networked games.
The Client-Server Model

Fig. 1-1. The client-server model.
The Internet

- Evolved from the ARPANET (the Advanced Research Projects Agency Network), a project funded by The U.S. Department of Defense (DOD) in 1969.
- ARPANET's purpose was to provide the U.S. Defense Network (DDN) with redundant links between its sites and the Pentagon, relying on intelligent data packets that could automatically route themselves around failed network routers and links.
- During the 1970s, the ARPANET gradually transformed and expanded into the current Internet as new protocols and technologies became available, and as additional defense, research, scientific, commercial and development organizations were added to the network.
- At the network layer level:
  The Internet is a global collection of networks held together by a common main network layer protocol: IP (Internet Protocol).
Origin of the Internet: Growth of ARPANET

Dec. 1969

July 1970

March 1971

April 1972

Sept. 1972
The Interconnection Structure of The Internet

Leased lines to Asia

US backbone

Leased transatlantic line

European backbone

Regional network

IP token bus LAN

IP token ring LAN

SNA network

Tunnel

IP Router

National network

Host

IP Ethernet LAN
Network Applications & Application Layer Protocols

• The development of numerous network applications and the associated application-layer protocols has been a major driving force for computer network advancements over the past 30 years.

• The range of such diverse applications include:
  – Text-based applications such as telnet, electronic mail, file transfer, newsgroups, most popular in the 70’s-80’s.
  – More recent graphics- and multimedia-based applications such as the World Wide Web, WWW (the Internet’s killer-app), Internet telephony, video conferencing, and streaming audio/video on demand, and interactive games.
The World Wide Web (WWW): HyperText Transfer Protocol (HTTP)

- The WWW was practically invented at CERN by Tim Berners-Lee and associates in 1989-1991 when initial versions of HTML, HTTP, a Web server and a crude text-based browser (Web client) were developed.

- Marc Andreeseen, who helped to develop the popular GUI browser Mosaic for X at The National Center for Supercomputing Applications (NCSA), released an alpha version of his browser in 1993, and in 1994 formed Mosaic Communications which later became Netscape.

- The Hypertext Transfer Protocol (HTTP) the Web's main application-layer protocol although current browsers can access other types of servers.

- As are most application-layer protocols, HTTP is implemented in two programs: a client program: Web browser and server program: Web server that talk to each other by exchanging HTTP messages.
Components of The Web Model

Web Servers

Web Clients

Sample Web URLs:
- jasmine.isc.rit.edu:8000 (Web server running on non-standard port)

Non-Standard Port Example:
- abc.com
- xyz.com
Uniform Resource Locators (URLs)

• Web browsers may utilize several high level protocols to request data from a variety of servers in addition to HTTP servers.

• A uniform source locator (URL) specifies the following:
  – Protocol used.
  – Host name, alias, or IP address.
  – Port number (if different from the default protocol port).
  – Path to data requested.
  – Resource requested (usually a file name).

• A few types of URLs:

  http http://hostname:port/path/resource
  e.g.  http://jasmine.isc.rit.edu:8000/eecc694-spring99/694-4-5-99.ppt

  FTP ftp://hostname:port/path/file  e.g.  ftp://beast.isc.rit.edu:25

  Local file file:///path/file  e.g.  file:///my_files/file1.txt

  Telnet telnet://hostname:port  e.g.  telnet://jasmine.isc.rit.edu

  gopher gopher://hostname/path/

  news news://hostname:port
The World Wide Web (WWW) Language: HyperText Markup Language (HTML)

• HTML is a collection of instructions (markup tags) that define the various components (elements) and format of a WWW document.

• An element is a component of the structure of a text document. e.g. heads, paragraphs, links, images, tables, lists etc.

• HTML documents are ASCII files that conform to HTML specifications (with the extension *.htm or *.html).

• Usual start HTML document naming: index.html

• In UNIX, HTML documents must have read permission by all to be accessed by a Web server (e.g chmod 644 file.html).

• Directories containing HTML documents accessed by a Web server must readable and executable by all (e.g in UNIX chmod 755 www)

• HTML is interpreted by Web browsers to view the formatted document.
HTML Tags and Elements

- An HTML tag denotes or marks an element of the document.
- HTML tags are not case-sensitive.
- HTML tags take the form:

  `<TAG_NAME>`

- Most tags apply to a block of text in the document and must have a start tag and an end tag:

  `<TAG_NAME> .... block of text ... </TAG_NAME>`
HTML Document Structure and Required Tags

- Every HTML document usually has the following structure:

```html
<HTML>
    <HEAD>
        <TITLE>
            Document Title Goes Here
        </TITLE>
    </HEAD>
    <BODY>
        .......
        The content of the document goes here
        .........
    </BODY>
</HTML>
```
Required HTML Structure Tags

<HTML> .... </HTML>
Tells the browser that the file is HTML-coded

<HEAD> ..... </HEAD>
Identifies the part of the document that contains the title.

<TITLE> .... </TITLE>
Contains the document title usually displayed at the top of
the browser window

<BODY> .... </BODY>
Contains the content of the document
The Hyper-link or Anchor Tag

\(<A>\) .... \(</A>\)

- Indicates the start/destination of a hyper-link
- Indicates that the text between \(<A>\) and \(</A>\) is HyperText
- The tag takes the form:

  \(<A \text{ HREF="URL"}>\text{HyperText}\</A>\)

- Example:

  \(<A \text{ HREF="http://dumbo.isc.rit.edu/"}>\text{Computer Engineering Home Page}\</A>\)

  – Clicking on the HyperText:
  
  Computer Engineering Home Page

  takes the user to the URL:

  http://dumbo.isc.rit.edu/
Character & Block Formatting Tags

• Headings:
  
  • `<H1>  <H2>  <H3>  <H4>  <H5>  <H6>`
  
  Larger

  • `<H1> ... Heading Text ... </H1>`

  H1 Heading

  H2 Heading

  H3 Heading

  H4 Heading

  H5 Heading

  H6 Heading
Character & Block Formatting Tags

• Center:
  
  \[<\text{CENTER}> \ldots \text{Centered Text} \ldots <\text{/CENTER}>\]

• Paragraph: (line break and blank line)
  
  \[<\text{P}> \ldots \text{Paragraph Text} \ldots <\text{/P}>\]

• Forced Line Break:
  
  \[<\text{BR}>\]

• Bold Face:
  
  \[<\text{B}> \ldots \text{Bold Face Text} \ldots <\text{/B}>\]

• Italic:
  
  \[<\text{I}> \ldots \text{Italic Text} \ldots <\text{/I}>\]

• Typewriter:
  
  \[<\text{TT}> \ldots \text{Fixed-Width Font} \ldots <\text{/TT}>\]

• Pre-formatted text:
  
  \[<\text{PRE}> \ldots \text{Text to appear exactly as typed} \ldots <\text{/PRE}>\]
Character & Block Formatting Tags

• List Tags:

• Ordered List:

  <OL>
  <LI> First Item
  <LI> Second Item
  ....
  <LI> Last Item

  </OL>

• Unordered List:

  <UL>
  <LI> First Item
  <LI> Second Item
  ....

  </UL>

  • First Item
  • Second Item
  ....
Horizontal Ruler Tag <HR>

• Horizontal rulers of varying lengths and widths create visual and logical breaks in a page. They are made with the <HG>

Examples:
• <HR> thin line that goes across the page
• <HR size=5> line across the page with width size 5
• <HR size=5 width=75%> line 75% across the page with width size 5
• <HR size=15 width=65% align=center> line 65% across the page, centered with width size 15
• <HR noshade> solid black line across the page
Text and Background Colors

- Text and background colors are specified in HTML documents using `<BODY>` tag attributes:

  ```html
  <BODY BGCOLOR="#rrggb" TEXT="#rrggb" LINK="#rrggb" VLINK="#rrggb" ALINK="#rrggb">
    ... Content of the document
  </BODY>
  ```

- BGCOLOR  background color
- TEXT      color of regular text
- LINK      color of unvisited links
- VLINK     color of visited links
- ALINK     color of active links

- #rrggb red-green-blue hexadecimal color triplet
- A GIF or JPEG file can also be used as a document background using the `<BODY>` attribute BACKGROUND

  ```html
  <BODY BACKGROUND="file.GIF">
  ```
Text Font/Size/Color:  `<FONT>  Tag

• The color and size of regular text in the document is specified by using the size and color attributes of the `<FONT>` tag:

  e.g.  `<FONT size=+2 color=#ff0000>
        This is red text and is two sizes larger than default size
   </FONT>`

• Where the default size is usually 3
Example 1

The course meets every Wednesday during the fall quarters for one lecture hour. In addition, some lab hours are scheduled for the digital simulation of logic circuits using Mentor Graphics, computer usage, web page building. Faculty members are involved in the planning and implementing the new course content.
EECC 200 Introduction to Computer Engineering

Course Outline
Fall Quarter, 1999

Department of Computer Engineering
Rochester Institute of Technology
Voice: (716) 475-2987
FAX: (716) 475-5041

Dr. Kenneth W. Hsu
E-mail: kwhec@rit.edu

8/4/99, 8/6/99, 8/10/99 (v3)

The course meets every Wednesday during the fall quarters for one lecture hour. In addition, some lab hours are scheduled for the digital simulation of logic circuits using Mentor Graphics, computer usage, web page building. Faculty members are involved in the planning and implementing the new
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http://meseec.ce.rit.edu/eecc200-fall2000/ce1.html
Images in HTML Documents:  <IMG> Tag

- The <IMG> tag can take the following attributes:
  - **SRC**
    - Specifies the image file to be displayed
    - e.g.  <IMG SRC="file_name.jpg">
  - **ALT**
    - Specifies text used instead of the image
    - e.g.  <IMG SRC="file_name.jpg" ALT="Image Name">
  - **BORDER**
    - Specifies the image border
  - **HSCAPE**
    - Space to the left and right of the image
  - **VSPACE**
    - Vertical space above and below the image
Image Alignment:  <IMG ALIGN=..>

align text to top of image

Tag:<img align=top src="construction.gif" alt="Page Under Construction">align text to top of image

align text to middle of image

Tag:<img align=middle src="construction.gif" alt="Page Under Construction">align text to middle of image

align text to bottom of image

Tag:<img align=bottom src="construction.gif" alt="Page Under Construction">align text to bottom of image
Example 2: Adding Images

<html>
<head>
<title>EECC 200 Introduction to Computer Engineering Home Page</title>
</head>
<body background="whitepaper.gif" bgcolor="#FFFFFF" link="#0000FF" vlink="#FF0000" text="#000000">
<center>
<h2>EECC 200 Introduction to Computer Engineering</h2>
Course Outline Fall Quarter, 1999
</h2>
<h3>
<a href="http://dumbo.isc.rit.edu/"> <img src="rit_ce.jpg" border=0><br>
Department of Computer Engineering</a>
<a href="http://www.rit.edu/" name="RIT"> Rochester Institute of Technology </a><br>
Voice: (716) 475-2987 FAX: (716) 475-5041<br>
<hr size=6 width=30%><br>
<a href="http://dumbo.isc.rit.edu/faculty/hsu.html"> Dr. Kenneth W. Hsu </a>
<img src="hsu.jpg" align=middle border=0><br>
E-mail: <a href="mailto:kwheec@rit.edu"> kwheec@rit.edu </a>
</h3>
<h4>
8/4/99, 8/6/99, 8/10/99 (v3)
</h4>
</center>
The course meets every Wednesday during the fall quarters for one lecture hour. In addition, some lab hours are scheduled for the digital simulation of logic circuits using Mentor Graphics, computer usage, web page building. Faculty members are involved in the planning and implementing the new course content.
</body>
</html>
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8/4/99, 8/6/99, 8/10/99 (v3)

The course meets every Wednesday during the fall quarters for one lecture hour. In addition,
Example 3: Unordered List

The objectives of this course are to introduce the Computer Engineering students to:

- Build a personal web page for personal electronic communications;
- Do time management and use a time planner effectively;
- Study engineering Ethics;
- Study logic circuits and their simulation;
- Learn Power Point, Excel, and MS Words (Students get helps: CBT, and Mentors)
- Build team work through fun Red Barn experience;
- Tour of Computer Engineering labs: Computer Architecture lab, Real time lab, DCO lab, and VLSI lab;
- Seek help from Mentors in studying CS1 and Calculus;
- Understand the computer engineering and the curriculum;
- Learn about career opportunities through the presentation by a distinguished alumnus.

who will inspire the freshmen to see their future career, as well as coop experience;
- Write an essay about a famous person in the computing history.

http://meseec.ce.rit.edu/eecc200-fall2000/ce3.html
<ul>
  <li>Build a personal web page for personal electronic communications;</li>
  <li>Do time management and use a time planner effectively;</li>
  <li>Study engineering Ethics;</li>
  <li>Study logic circuits and their simulation;</li>
  <li>Learn Power Point, Excel, and MS Words (Students get helps: CBT, and Mentors)</li>
  <li>Build team work through fun Red Barn experience;</li>
  <li>Tour of Computer Engineering labs: Computer Architecture lab, Real time lab, DCO lab, and VLSI lab;</li>
  <li>Seek help from Mentors in studying CS1 and Calculus;</li>
  <li>Understand the computer engineering and the curriculum;</li>
  <li>Learn about career opportunities through the presentation by a distinguished alumnus. who will inspire the freshmen to see their future career, as well as coop experience;</li>
  <li>Write an essay about a famous person in the computing history.</li>
</ul>

http://mesecf.ce.rit.edu/eecc200-fall2000/ce3.html
Example 4: Ordered List

<?
<H3> Textbook: None</H3>
<H3> Reference Books: </H3>

The following books are placed in the two-hour reserve in the RIT Wallace Memorial Library for your use.

<OL>
  <LI> Paul E. Ceruzzi, A History of Modern Computing, the MIT Press, 1998
  <LI> Alan W. Biermann, Great Ideas in Computer Science, (2nd ed.), the MIT Press, 1997
  <LI> Edward Yourdon, Decline & Fall of the American Programmer, Yourdon Press, 1992
</OL>
The following books are placed in the two-hour reserve in the RIT Wallace Memorial Library for your use.

8. Edward Yourdon, Decline & Fall of the American Programmer, Yourdon Press, 1992

http://meseec.ce.rit.edu/eecc200-fall2000/ce4.html
Basic Table Tags

- `<TABLE> ... </TABLE>`  Start and end of table
- `<TR> ... </TR>`  Table Row includes a number of TD cell tags that are in the same row
- `<TD> ... </TD>`  Table Data cell creates a data cell or table entry.

Example: A basic 2x2 table

```
<TABLE BORDER>
 <TR>
  <TD>A</TD>
  <TD>B</TD>
 </TR>
 <TR>
  <TD>C</TD>
  <TD>D</TD>
 </TR>
</TABLE>
```

Note: The BORDER attribute in `<TABLE>` makes the table visible. Without it the table borders are invisible.
Putting Your Web Page Online Using The RIT DCE (grace) Account

Step 1: Setting permissions to make files world readable:

1. Run Telnet (Open connection Host: grace.rit.edu) or on a terminal at the Local>c grace, or connect to the VAX as usual and telnet grace.rit.edu from the $.
2. Login with your DCE username and password to grace. Note: ofw will only work on grace. On other UNIX machines you must set UNIX protections.
3. If this is the first time into your grace account, type mkdir www at the %
4. Type ofw at the % prompt to get a prompt:
5. This will open your account for WEB access
   Is this what you want to do? [y,n] Type the letter y
6. If you do not get the open for web prompt: type /usr/local/bin/ofw at the %.

Step 2: Moving files (HTML, images etc.) to your account in the directory www using FTP if needed.

(consult RIT Start Page: http://wally.rit.edu/pubs/starts/isc/personal-home-page.html for more information and detailed instructions on using FTP)
Assignment:
Create Your Own Home Page
Due November 1st.

• Include the following in your home page on grace:
  – Your photo.
  – Information about yourself.
  – The current courses you are currently taking with details of each course.
  – Some of your favorite web links.
  – An initial short version of your resume.
  • Sample Computer Engineering Resume:
    http://www.rit.edu/~964www/Student/jobsearchinfo/pdf_resumes/Compeng.PDF
    – Use a standard file name for your main page (i.e. index.html).
    – This page must be completed and accessible at:
      http://www.rit.edu/~your_user_name/
Useful Links

• Department of Computer Engineering Home Page:
  http://dumbo.isc.rit.edu/

• NCSA’s Beginner's Guide to HTML:
  http://www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimerAll.html

• RIT Web developer's page
  http://wally.rit.edu/instruction/web/

• Learning HTML by the Tags Tutorial:
  http://wally.rit.edu/instruction/web/htmltags/tutorial.html

• RIT Start Page: Personal Home Page:
  http://wally.rit.edu/pubs/starts/isc/personal-home-page.html