

HTML, XHTML, and CSS, 6th Edition

Chapter One: Introduction to HTML, XHTML, and CSS

A Guide to this Instructor's Manual:

We have designed this Instructor's Manual to supplement and enhance your teaching experience through classroom activities and a cohesive chapter summary.

This document is organized chronologically, using the same heading in **red** that you see in the textbook. Under each heading you will find (in order): Lecture Notes that summarize the section, Figures and Boxes found in the section, if any, Teacher Tips, Classroom Activities, and Lab Activities. Pay special attention to teaching tips, and activities geared towards quizzing your students, enhancing their critical thinking skills, and encouraging experimentation within the software.

In addition to this Instructor's Manual, our Instructor's Resources CD also contains PowerPoint Presentations, Test Banks, and other supplements to aid in your teaching experience.

For your students:

Our latest online feature, CourseCasts, is a library of weekly podcasts designed to keep your students up to date with the latest in technology news. Direct your students to <http://coursecasts.course.com>, where they can download the most recent CourseCast onto their mp3 player. Ken Baldauf, host of CourseCasts, is a faculty member of the Florida State University Computer Science Department where he is responsible for teaching technology classes to thousands of FSU students each year. Ken is an expert in the latest technology and sorts through and aggregates the most pertinent news and information for CourseCasts so your students can spend their time enjoying technology, rather than trying to figure it out. Open or close your lecture with a discussion based on the latest CourseCast.

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Chapter Objectives

Students will have mastered the material in Chapter One when they can:

- Describe the Internet and its associated key terms
- Describe the World Wide Web and its associated key terms

- Describe the types and purposes of Web sites
- Discuss Web browsers and identify their purpose
- Define Hypertext Markup Language (HTML) and its associated standards used for Web development
- Discuss the use of Cascading Style Sheets (CSS) in Web development
- Define the Document Object Model (DOM) and describe its relationship to HTML
- Define Extensible Hypertext Markup Language (XHTML) and describe its relationship to HTML
- Identify tools used to create HTML documents
- Describe the five phases of the Web development life cycle
- Describe the different methods of Web site design and the purpose of each Web site structure
- Discuss the importance of testing throughout the Web development life cycle
- Explain the importance of being an observant Web user

HTML 2: Introduction

LECTURE NOTES

- Introduce the Internet as the world's largest network
- Introduce the three technologies to be covered in detail in this text: Hypertext Markup Language (HTML), Extensible Hypertext Markup Language (XHTML), and Cascading Style Sheets (CSS)

CLASSROOM ACTIVITIES

1. Group Activity: Explain that the Internet is more than just the World Wide Web; it also includes FTP (file transfer protocol), texting, VoIP, and e-mail technologies, among other things. Survey students about their use of the range of Internet technologies.

2. Quick Quiz:

- 1) How many Web pages are currently available on the World Wide Web? (Answer: billions of Web pages)

HTML 2: What Is the Internet?

LECTURE NOTES

- Define the Internet and use Figure 1-1 to illustrate the connections that support the Internet
- Define network and Internet backbone
- Define Internet service provider (ISP), and use Figure 1-2 to illustrate some of the services available via the Internet

FIGURES: 1-1, 1-2

TEACHER TIPS

Explain that the Internet, often known simply as "the Net," is a worldwide system of computer networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers). The following background may be of interest to your students: Originated in 1969 by the Advanced Research Projects Agency (ARPA) of the U.S. government, the Internet was originally called the ARPANET. At the outset, the goal of the ARPANET was to build a network that would allow users of a research computer at one

university to be able to connect to research computers at other universities. Because it permitted messages to be routed or rerouted in more than one direction, an ancillary benefit of ARPANET's design was that, because the network could continue to function even if parts of it were destroyed in the event of a military attack or other disaster. The Internet is now a public, cooperative, and self-sustaining facility accessible to hundreds of millions of people around the world, using a portion of the total resources of the currently existing public telecommunication networks.

As you explain networks, discuss that in information technology, a network is defined as a series of nodes interconnected by communication paths. Networks can interconnect with other networks and also can contain subnetworks. On the Internet (or other wide area network), a backbone is a set of paths that local or regional networks connect to for long-distance interconnection; the connection points are known as telecommunication data switching exchanges (DSEs) or network nodes.

As you define what an ISP is, explain that an ISP provides individuals and other companies access to the Internet and other related services such as Web site building and virtual hosting. An ISP has the equipment and the telecommunication line access required to have a point-of-presence on the Internet for the geographic area served. Larger ISPs have their own high-speed leased lines so that they are less dependent on the telecommunication providers and can provide better service to their customers. Online service providers (OSPs) such as America Online are another avenue of providing access to Internet users.

CLASSROOM ACTIVITIES

1. Class Discussion: Ask students about their experience using networks, perhaps as part of a computer class. Do they have a user account assigned to them on their school network? Explore students' experience with ISPs. Do they have accounts with ISPs? Which ISPs?
2. Assign a Project: Ask students to research three different major ISPs on the Web, and to compare and contrast the services they provide, their pricing, etc.
3. Quick Quiz:
 - 1) What is the Internet backbone? (Answer: A collection of high-speed data lines that connect major computer systems located around the world)

HTML 3: What Is the World Wide Web?

LECTURE NOTES

- Define the World Wide Web (or Web)
- Define Hypertext Transfer Protocol (HTTP)
- Define the following terms: Web pages, Web site, and home page, and use Figure 1-3 to review the features of a Web site for a university
- Define Web server (host), and publishing
- Use Table 1-1 to list the characteristics of three general types of Web sites: Internet, intranet, and extranet
- Define Internet site (Web site)
- Define intranet and extranet
- Define electronic commerce (e-commerce), and use Figure 1-4 to show an e-commerce Web site

- Use Figure 1-5 to discuss the features of a Web page from a university Web site, and use Figure 1-6 as an example of a personal Web site
- Explain the purpose of a Web browser (browser)
- Define Uniform Resource Locator (URL), and hyperlink (or link), and show the links in Figure 1-7

FIGURES and TABLES: Figures — 1-3, 1-4, 1-5, 1-6, 1-7; Table — 1-1

BOXES

1. BTW: *Internet and WWW History*. Refer students to the W3C Web site for historical information about the Web.
2. BTW: *Intranets and Extranets*. Encourage students to investigate the CIO Intranet/Extranet Research Center as a source for more information and best practice techniques for these technologies.
3. BTW: *E-Commerce*. Encourage students to look in more depth at e-commerce as a means of doing business.

TEACHER TIPS

Provide the following technical definition of the World Wide Web, as all the resources and users on the Internet that are using the Hypertext Transfer Protocol, as well as this more expansive definition from Tim Berners-Lee: "The World Wide Web is the universe of network-accessible information, an embodiment of human knowledge."

Explain that HTTP is the set of rules for transferring text, sound, video, graphic images, and other multimedia files on the Web. When Web users open their Web browsers, the users are indirectly making use of HTTP, which is an application protocol that runs on top of the TCP/IP suite of protocols — the foundation protocols for the Internet.

Define a Web site as a related collection of files on the Web that includes a beginning file called a home page. A company, for example, tells you how to get to its Web site by giving you the address of its home page. From the home page, you can get to all the other pages on their site. For example, the Web site for IBM has the home page address of <http://www.ibm.com>.

Explain that because the term "site" implies a geographic place, the term Web site can sometimes be mistakenly used in place of the term "Web server." A server is a computer that holds the files for one or more sites. A very large Web site may be spread over a number of servers in different geographic locations. IBM is a good example; its Web site consists of thousands of files spread out over many servers in world-wide locations.

Explain that e-commerce (electronic commerce or EC) is the buying and selling of goods and services on the Internet, especially the World Wide Web. In practice, this term and a newer term, e-business, are often used interchangeably. For online retail selling, the term e-tailing is sometimes used. E-commerce can be divided into:

- 1) B2B buying and selling
- 2) The gathering and use of demographic data through Web contacts
- 3) Electronic Data Interchange (EDI), the business-to-business exchange of data

- 4) E-mail and its use as media for reaching prospects and established customers (e.g., e-mail newsletters)
- 5) E-tailing or "virtual storefronts" on Web sites with online catalogs, sometimes gathered into a "virtual mall"
- 6) The security of business transactions

Explain that an intranet, which is a private network contained within an enterprise, may consist of many interlinked local area networks and also use leased lines in the wide area network. Typically, an intranet includes connections through one or more gateway computers to the outside Internet. Its main purpose is to share company information and computing resources among employees, although it can also be used to facilitate working in groups and for teleconferences. Extranets are private networks that use the Internet protocol and the public telecommunication system to securely share part of a business's information or operations with suppliers, vendors, partners, customers, or other businesses, an extranet can be viewed as part of a company's intranet that has been extended to users outside the company. It is particularly useful as a way to do business with other companies and to sell products to customers.

Explain that a browser is an application program that provides a way to look at and interact with all the information on the World Wide Web. The word "browser" seems to have originated prior to the Web as a generic term for user interfaces that let you navigate through and read text files online. By the time the first Web browser with a graphical user interface was generally available (Mosaic, in 1993), the term seemed to apply to Web content, too. Technically, a Web browser is a client program that uses the Hypertext Transfer Protocol (HTTP) to make requests of Web servers throughout the Internet on behalf of the browser user. Many of the user interface features in Mosaic, the original Web browser, however, went into the first widely used browser, Netscape Navigator, which Microsoft followed with Internet Explorer. Today, Mozilla Firefox and Internet Explorer are the two browsers that the vast majority of Internet users are aware of. Although the online services, such as America Online, originally had their own browsers, virtually all now offer other browsers. Lynx is a text-only browser for UNIX shell and VMS users, and Opera is another well-regarded browser.

Explain to students that a URL (Uniform Resource Locator, previously Universal Resource Locator) is usually pronounced by sounding out each letter but, in some places, is pronounced "Earl." A URL is the unique address for a file accessible on the Internet. A common way to get to a Web site is to enter the URL of its home page file in your Web browser's address line. However, any file within that Web site can also be specified with a URL. Such a file might be any Web (HTML) page other than the home page, an image file, or a program such as a common gateway interface application or Java applet. The URL contains the name of the protocol to be used to access the file resource, a domain name that identifies a specific computer on the Internet, and a pathname, a hierarchical description that specifies the location of a file in that computer. The protocol used to transfer Web resources is `http://`, which stands for Hypertext Transfer Protocol. Alternative protocols include `ftp://` and `telnet://`.

Mention to students that it is conjectured that the term "hyperlink" originated because "link" was not felt to be specific enough and because it is shorter than "hypertext link."

CLASSROOM ACTIVITIES

1. Assign a Project: Ask students to compare and contrast the features and content of the home pages of three of their favorite sites. Alternately, assign three sites to students for this comparative analysis.

2. Assign a Project: Ask students to use a Web search engine to locate lists of guidelines (“how-to” guides) for Web publishing.
3. Assign a Project: Ask students to compare and contrast the features and content of the three e-commerce sites. Alternately, assign three sites to students for this comparative analysis.
4. Assign a Project: Assign students the task of locating examples of text, graphic, and menu bar links on other Web sites, examples of which are provided in Figure 1-7 on page HTML 8.
5. Group Activity: If possible, show students examples of Web pages within each of the three categories of sites. Survey students about their experience visiting personal Web pages (or perhaps creating simple ones with tools provided by the ISPs). Also, survey students about their experience visiting and using e-commerce Web sites.

HTML 8: What Is Hypertext Markup Language?

LECTURE NOTES

- Define Hypertext Markup Language (HTML)
- Define tags or markup and attributes, and use Figure 1-8a in conjunction with Figure 1-8b to review the HTML tags used to create a particular Web page
- Define platform independent
- Discuss the three components of most HTML elements: the start tag, the content, and the end tag, and use Table 1-2 to review some sample HTML elements
- Review the coding practices designed to simplify the process of creating and editing HTML, and use Figure 1-9 to show the easily read HTML code separated by spaces
- Discuss the expansion of HTML's capabilities with each successive version, and explain what deprecated tags are
- Define style and Cascading Style Sheets (CSS), and discuss the utility of CSS, particularly with regard to the ease with which large Web sites can be maintained using CSS
- Define style sheet and refer students to Appendices A and D for more information about HTML tags and attributes, and CSS elements, properties, and values, respectively
- Define Document Object Model (DOM)
- Define Extensible Markup Language (XML) and Extensible Hypertext Markup Language (XHTML), and use Table 1-3 to review XHTML coding practices.

FIGURES and TABLES: Figures — 1-8a, 1-8b, 1-9; Tables — 1-2, 1-3

BOXES

1. BTW: *HTML Elements*. Refer students to the W3C Web site to view its comprehensive list of tags and attributes.
2. BTW: *CSS, DHTML, and XHTML*. Encourage students to visit the W3C Web site to get more information about these three technologies.

TEACHER TIPS

Provide simple examples of the use of the Document Object Model, as on pages that feature (1) changes to the color of a text heading when a user passes a mouse over it or (2) the capability of a user to "drag

and drop" an image to another place on a Web page. The use of the DOM can allow Web documents to look and act like desktop applications or multimedia productions.

Explain that XML is a structured set of rules for how one might define any kind of data to be shared on the Web. XML is called an "extensible" markup language because anyone can invent a particular set of markup for a particular purpose and as long as everyone uses it (the writer and an application program at the receiver's end), it can be adapted and used for many purposes (e.g., describing the appearance of a Web page).

XHTML is the result of reframing HTML in terms of XML; it is a particular application of XML for "expressing" Web pages. Extensibility means that as new ideas for Web communication and presentation emerge, they can be implemented without having to wait for the next major version of HTML and browser support. New tags or attributes can be defined to express the new possibilities and, assuming some program at the receiving end can understand and act on them, new things may happen on your Web page that never happened before.

Specific sets of extensions for XHTML are designed for mathematical expressions, vector graphics, and multimedia applications. If extensibility is likely to lead to more complicated pages and larger programs, the portability advantage means that Web pages can now be made simpler than they were before so that small devices can handle them. This is important for mobile devices and household devices that contain microprocessors with embedded programming and smaller memories. XHTML defines several levels of possible markup complexity and each document states its level of complexity at the beginning. Programs in microdevices might expect XHTML-coded files that state the simplest level of complexity so that they could be handled by a small program and memory.

CLASSROOM ACTIVITIES

1. Group Activity: If possible, display the HTML code for the types of elements shown in Table 1-2 and corresponding Web page elements as they display in a browser.
2. Group Activity: If possible, show how one change to a style sheet can be propagated across one or more Web pages, perhaps using a personal Web site linked to an external style sheet.
3. Assign a Project: Ask students to research the different HTML versions on the Web and read about new features that have been introduced with each subsequent version.
4. Assign a Project: Ask students to research DHTML on the Web to learn more about it.
5. Quick Quiz:
 - 1) With ____ you write code that allows you to control an element within a single Web page or throughout an entire Web site. (Answer: CSS, or Cascading Style Sheets)
 - 2) Which of the following is a markup language that uses tags to describe the structure and content of a document, not the format? a) CSS b) XML c) DHTML d) HTML (Answer: b)
 - 3) By incorporating HTML and XML, XHTML combines the display features of HTML and the stricter coding standards required by XML. True or false? (Answer: True)

LAB ACTIVITIES

1. Ask students to use a search engine to research five or six tags and/or attributes and examples of their use from the W3C Web site.

HTML 13: Tools for Creating HTML Documents

LECTURE NOTES

- Define text editor, and use Figure 1-10 to show the use of a text editor (Notepad) to type HTML tags directly into the document
- Define HTML text editor, HTML object editor, and WYSIWYG editor

FIGURES and TABLES: Figures — 1-10a, 1-10b

BOXES

1. BTW: *Free HTML WYSIWYG Editors*. Encourage students to learn more about free HTML editors available on the Web.

CLASSROOM ACTIVITIES

1. Quick Quiz:

- 1) What is a text editor? (Answer: A program that allows a user to enter, change, save, and print text, such as HTML)
- 2) What is an HTML text editor? (Answer: A program that provides basic text-editing functions as well as more advanced features for entering HTML code)
- 3) What is an HTML object editor? (Answer: An HTML editor that provides the additional functionality of an outline editor that allows you to expand and collapse HTML objects and properties, edit parameters, and view graphics attached to the expanded objects)
- 4) What is a WYSIWYG editor? (Answer: A program that provides a graphical user interface that allows a developer to preview the Web page during its development)

LAB ACTIVITIES

1. Ask students to use a search engine to identify a free WYSIWYG HTML editor and, if possible, to download and install it and experiment with its use.

HTML 14: Web Development Life Cycle

LECTURE NOTES

- Discuss the Systems Development Life Cycle, and explain how the Web development life cycle is a similar resource
- Use Table 1-4 to review the phases of Web development and the questions to answer at each point in the cycle
- Review the questions to answer at the first step in the Web development life cycle
- Review the decisions to be made at the second stage in the Web development life cycle
- Review the considerations of the third stage in the Web development life cycle, and use Table 1-5 to discuss some of the organizational standards for creating a Web page that is easy to read and navigate
- Explain what a linear Web site structure is and use Figures 1-11 and 1-12 to show examples
- Explain what a hierarchical Web site structure is and use Figure 1-13 to show an example
- Explain what a webbed Web site structure is and use Figure 1-14 to show an example
- Define broad Web site and deep Web site and use Figures 1-15 and 1-16 to show examples of each

- Discuss accessibility issues and internationalization as key considerations when developing Web sites for the broadest possible audience
- Define usability and usability testing, compatibility testing, and stress testing, and use Figure 1-17 to review the features of a sample usability testing questionnaire
- Discuss the publishing of Web pages to a Web server, and mention the use of FTP software as a means of publishing Web pages
- Emphasize the importance of developing effective processes for Web site maintenance, with the priorities of keeping the content up to date and of maintaining a consistent look across the pages of the Web site
- Define log

FIGURES and TABLES: Figures — 1-11, 1-12, 1-13, 1-14, 1-15, 1-16, 1-17; Tables — 1-4, 1-5

BOXES

1. BTW: *Accessibility Standards*. Encourage students to read Appendix C for more information about accessibility guidelines.
2. BTW: *User Interface Design*. Emphasize the importance of effective user interface design for Web sites.
3. BTW: *Web Page Structure*. Encourage students to use a search engine to find some of the design sources referred to in the text.
4. BTW: *Web Site Testing*. Stress the significant role that testing plays in Web site development.

TEACHER TIP

Review the sample steps for testing content and functionality. Usability is the measure of a product's potential to accomplish the goals of the user. Although the term can be used in relation to any product that is employed to accomplish a task (e.g., a wristwatch, a phone), the term is often used in IT in relation to software applications and Web sites. Factors used to assess product usability include visual consistency, ease-of-use, and a clear, defined process for evolution. Usability testing is a method by which users of a product are asked to perform certain tasks in an effort to measure the product's ease-of-use, task time, and the user's perception of the experience. It can be done formally, in a usability lab with video cameras, or informally, with paper mock-ups of an application or Web site. Based on the findings of the usability tests, changes are made to the application or site. Whether the test is formal or informal, usability test participants are encouraged to think aloud and voice their every opinion. Usability testing is best used in conjunction with user-centered design, a method by which a product is designed according to the needs and specifications of users.

CLASSROOM ACTIVITIES

1. Assign a Project: Assign students the task of researching usability testing on the Web to learn more about it.

LAB ACTIVITIES

1. Encourage students to either design a questionnaire like the one in Figure 1-17 or to use the one in that figure to rate a Web site of their choosing.

HTML 24: Be an Observant Web User

LECTURE NOTES

- Encourage students to be conscious of their role as observers of Web design at the same time that they are users of the Web

BOXES

1. BTW: *Quick Reference*. Encourage students to refer to Appendix A for a list of HTML tags and their associated attributes.

LAB ACTIVITIES

1. Encourage students to find two or three Web sites that are in the vanguard of Web site design; good places to look are Web sites belonging to major international corporations (Coca-Cola, Nike) and Web site design firms.

End of Chapter Material

- **Chapter Summary** provides a general survey of the material in the chapter. Students can use these pages to reinforce their achievement of the chapter objectives.
- **Learn It Online** exercises ask students to visit the Online Companion that offers additional information, resources, and activities related to the topics presented in the chapter.
- The **Apply Your Knowledge** section includes short exercises and review questions that reinforce concepts and provide opportunities to practice skills.
- **Extend Your Knowledge** exercises allow students to expand their knowledge by solving practical problems and experimenting with new skills, using Help.
- In the **Make It Right** exercises, students take the necessary steps to correct all the errors in a document and/or improve its design.
- The **In the Lab** activities solidify the concepts presented in the chapter with practical application.
- Thought-provoking **Cases and Places** exercises in each chapter exercise students' minds and challenge them to construct creative solutions. These exercises are constructed to allow students to work independently and collaboratively.

Glossary of Key Terms

- attributes (HTML 8)
- broad Web site (HTML 19)
- Cascading Style Sheets (CSS) (HTML 11)
- compatibility testing (HTML 22)
- deep Web site (HTML 20)
- deprecated (HTML 11)
- Document Object Model (DOM) (HTML 11)
- electronic commerce (e-commerce) (HTML 5)
- Extensible Hypertext Markup Language (XHTML) (HTML 12)
- Extensible Markup Language (XML) (HTML 12)
- extranet (HTML 5)
- hierarchical (HTML 18)
- home page (HTML 4)
- HTML text editor (HTML 14)
- HTML object editor (HTML 14)
- hyperlink (link) (HTML 7)
- Hypertext Markup Language (HTML) (HTML 8)
- Hypertext Transfer Protocol (HTTP) (HTML 3)
- Internet (HTML 2)
- Internet backbone (HTML 3)
- Internet service provider (ISP) (HTML 3)
- Internet site (HTML 5)
- intranet (HTML 5)
- linear (HTML 17)
- log (HTML 24)
- network (HTML 3)
- platform independent (HTML 9)
- publishing (HTML 4)
- stress testing (HTML 23)
- style (HTML 11)
- style sheet (HTML 11)
- tags (markup) (HTML 8)
- text editor (HTML 13)
- Uniform Resource Locator (URL) (HTML 7)
- usability (HTML 22)
- usability testing (HTML 22)
- Web browser (browser) (HTML 7)
- Web development life cycle (HTML 14)
- Web pages (HTML 3)
- Web server (host) (HTML 4)
- Web site (HTML 4 and HTML 5)
- webbed (HTML 18)
- World Wide Web (Web) (HTML 3)
- WYSIWYG editor (HTML 14)

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