GOMBE STATE UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE

COSC 319: Web Technology

By

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COURSE OUTLINE

1. A brief history of Internet.
2. Basic Definitions: Design, Web Design, World Wide Web, Browsers, Web Servers
3. Introduction to HTML.
4. Building Web Application using Dreamweaver – Window Elements, Site Definition, Text, Colour, Background, Graphics, Linking.
5. Dynamic Web Application Using PHP
6. Basic Cascading Style Sheet
7. Graphic Design using Macromedia Fireworks, Macromedia Flash, 3D Flash Animator, Photoshop etc.
8. Client Server Computing using the Web.
9. Client Site Script: JavaScript, VB Script
10. Server Site Script: PHP, ASP, JSP, etc.
11. Web Development for Mobile and Wireless Computing
12. Proofing and testing the site
13. Content Management System
14. Publishing via FTP
15. Hosting Site

What is Internet

The Internet is the global system of interconnected computer networks that uses the Internet protocol suite to communicate between networks and devices. It is a network of networks that consists of private, public, academic, business, and government networks of local to global scope, linked by a broad array of electronic, wireless, and optical networking technologies.

Evolution of Internet

The concept of Internet was originated in 1969 and has undergone several technological & Infrastructural changes as discussed below:

- The origin of Internet devised from the concept of **Advanced Research Project Agency Network (ARPANET).**
- **ARPANET** was developed by United States Department of Defense.
- Basic purpose of ARPANET was to provide communication among the various bodies of government.
- Initially, there were only four nodes, formally called **Hosts.**
- In 1972, the **ARPANET** spread over the globe with 23 nodes located at different countries and thus became known as **Internet.**
- By the time, with invention of new technologies such as TCP/IP protocols, DNS, WWW, browsers, scripting languages etc.,Internet provided a medium to publish and access information over the web.

Internet Domain Name System

When **DNS** was not into existence, one had to download a **Host file** containing host names and their corresponding IP address. But with increase in number of hosts of internet, the size of host file also increased. This resulted in increased traffic on downloading this file. To solve this problem the DNS system was introduced.

Domain Name System helps to resolve the host name to an address. It uses a hierarchical naming scheme and distributed database of IP addresses and associated names

IP Address

IP address is a unique logical address assigned to a machine over the network. An IP address exhibits the following properties:

- IP address is the unique address assigned to each host present on Internet.
- IP address is 32 bits (4 bytes) long.
- IP address consists of two components: **network component** and **host component**.
- Each of the 4 bytes is represented by a number from 0 to 255, separated with dots. For example 137.170.4.124

Uniform Resource Locator (URL)

Uniform Resource Locator (URL) refers to a web address which uniquely identifies a document over the internet.

This document can be a web page, image, audio, video or anything else present on the web.

For example, **www.gsu.edu.ng/internet_technology/index.html** is an URL to the index.html which is stored on GSU web server under internet_technology directory.

URL Types

There are two forms of URL as listed below:

- Absolute URL
- Relative URL

Absolute URL

Absolute URL is a complete address of a resource on the web. This completed address comprises of protocol used, server name, path name and file name.

For example http:// www.gsu.edu.ng / internet_technology /index.htm. where:

- **http** is the protocol.
- **gsu.edu.ng** is the server's name.
- **index.htm** is the file name.

The protocol part tells the web browser how to handle the file. Similarly we have some other protocols also that can be used to create URL are:

- FTP
- https
- Gopher
- mailto
- news

Relative URL

Relative URL is a partial address of a webpage. Unlike absolute URL, the protocol and server part are omitted from relative URL.

Relative URLs are used for internal links i.e. to create links to file that are part of same website as the WebPages on which you are placing the link.

For example, to link an image on gsu.edu.ng/internet_technology/internet_referemce_models, we can use the relative URL which can take the form like **/internet_technologies/internet-osi_model.jpg.**

Difference between Absolute and Relative URL

Absolute URL	Relative URL
Used to link web pages on different websites	Used to link web pages within the same website.
Difficult to manage.	Easy to Manage
Changes when the server name or directory name changes	Remains same even of we change the server name or directory name.
Take time to access	Comparatively faster to access.

Domain Name System Architecture

The Domain name system comprises of **Domain Names, Domain Name Space, Name Server** that have been described below:

Domain Names

Domain Name is a symbolic string associated with an IP address. There are several domain names available; some of them are generic such as **com, edu, gov, net** etc, while some country level domain names such as **au, in, za, us** etc.

The following table shows the **Generic** Top-Level Domain names:

Domain Name	Meaning
.com	Commercial business

.edu	Education
.gov	Government Agency
.int	International entity
.mil	U.S. military
.net	Networking organization
.com	Non profit organization

The following table shows the **Country top-level** domain names:

Domain Name	Meaning
au	Australia
in	India
cl	Chile
fr	France
us	United States
za	South Africa
uk	United Kingdom
jp	Japan
es	Spain
de	Germany
ca	Canada
ee	Estonia
hk	Hong Kong
ng	Nigeria

DNS Working

DNS translates the domain name into IP address automatically. Following steps will take you through the steps included in domain resolution process:

- When we type **www.gsu.edu.ng** into the browser, it asks the local DNS Server for its IP address.

Here the local DNS is at ISP end.

- When the local DNS does not find the IP address of requested domain name, it forwards the request to the root DNS server and again enquires about IP address of it.
- The root DNS server replies with delegation that **I do not know the IP address of www. gsu.edu.ng but know the IP address of DNS Server.**
- The local DNS server then asks the com DNS Server the same question.
- The **com** DNS Server replies the same that it does not know the IP address of www.**gsu.edu.ng** but knows the address of **gsu.edu.ng**.
- Then the local DNS asks the **gsu.edu.ng** DNS server the same question.
- Then **gsu.edu.ng** DNS server replies with IP address of **www.gsu.edu.ng**
- Now, the local DNS sends the IP address of **www.gsu.edu.ng** to the computer that sends the request.

Web Design

Web design refers to the process of creating a website, from the structure of each page to the color schemes and font choices.

What is the difference between web design and Web Development?

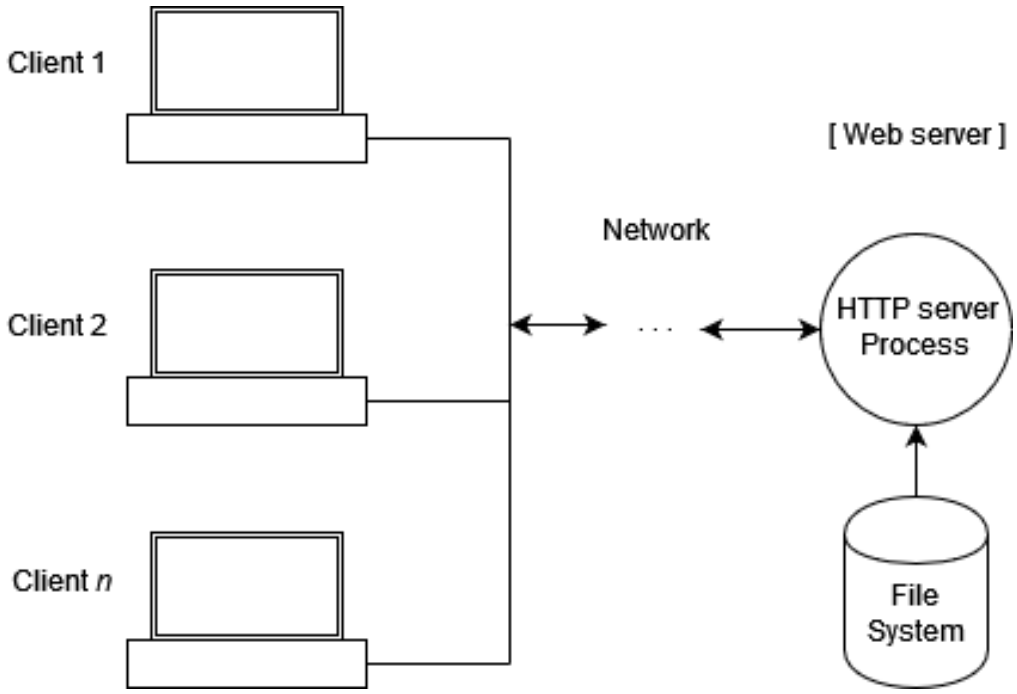
It's worth noting the distinction between web design and web development. Web development is a broader term, and it includes setting up the back-end side of your website — that is, all the behind-the-scenes coding. Web *design*, however, is limited to front-end optimization — that is, the part of your website users see.

Web browser

A web browser is an application for accessing websites. When a user requests a web page from a particular website, the browser retrieves its files from a web server and then displays the page on the user's screen. Browsers are used on a range of devices, including desktops, laptops, tablets, and smartphones

Web server

A web server is computer software and underlying hardware that accepts requests via HTTP or its secure variant HTTPS. A user agent, commonly a web browser or web crawler, initiates communication by making a request for a web page or other resource using HTTP, and the server responds with the content of that resource or an error message



Apache Web Server

Apache web server is one of the most popular web servers developed by the Apache Software Foundation. Open source software, Apache supports almost all operating systems such as Linux, Windows, Unix FreeBSD, Mac OS and more. Approximately, 6o% of the machines run on Apache Web Server.

- WAMP (Windows, Apache, MySQL, and PHP)
- MAMP (Mac, Apache, MySQL, and PHP)
- LAMP (Linux, Apache, MySQL, and PHP)
- XAMPP (Cross Platform, Apache, MySQL, and PHP or Perl)

Introduction to HTML

HTML stands for Hypertext Markup Language. It is the most basic language, and simple to learn and modify. It is a combination of both hypertext and markup language. It contains the elements that can change/develop a web page's look and the displayed contents. Or we can say that HTML creates or defines the structure of web pages. We can create websites using HTML which can be viewed on internet-connected devices like laptops, android mobile phones, etc. It was created by Tim Berners-Lee in 1991. The first version of HTML is HTML 2.0 which was published in 1999, and the latest version is HTML 5. We can save HTML files with an extension .html.

What is Hypertext?

Text that is not restricted to a sequential format and that includes links to other text is called Hypertext. The links can connect online pages inside a single or different website.

What is Markup Language?

Markup Language is a language that is interpreted by the browser and it defines the elements within a document using "tags". It is human-readable, which means that markup files use common words rather than the complicated syntax of programming languages.

What are Tags and Elements in HTML?

HTML Tags: HTML tags are special keywords that specify how the data will be displayed or how to format the data by the web browsers. With tags, the web browser can make out in the document that: what is HTML content and what is the normal plain content (as tags are always written in angular brackets <>). Usually, the start of the tags is given by angular brackets <> and the end by angular brackets, and / that is </>.

Example:

<head></head>

HTML Element: The collection of start and end tags with the content inserted in between them is known as an HTML element.

Example:

<head> I am HTML element </head>

Important HTML Tags:

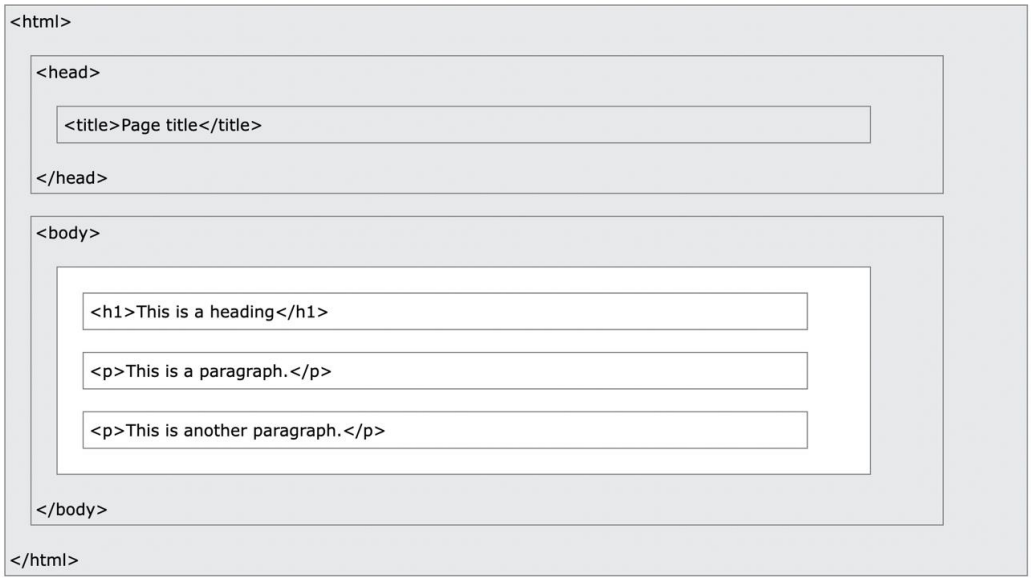
- **<!DOCTYPE html>:** Defines the type of document. Here it defines that the document type is HTML.
- **<html> </html>:** It is the root element and all the other tags are contained in it. It determines the start and the end of the HTML document.
- **<head> </head>:** It contains metadata of the HTML document & is actually not displayed on the webpage. The heading starts with <head> and end with </head>.
- **<title> </title>:** It is used to create a title of the document and the title appears in the title bar at the top. At least one title appears in every document. The title

portion of the document starts with <title> and ends with </title>, and in between, enter the text that you want as the title.

- **<body> </body>:** It contains the contents of the document to be displayed on the web page. The content may be an image, some text, some links, etc. This part represents the body of the web document, which often includes headings, text, and paragraphs.
- **<p>:** It is used for defining a paragraph.
- **
:** It is used for a single-line break.
- **<img>:** It is used for defining an image with a given source.
- **<sup>:** It is used for defining superscripted data.
- **<b>:** It is used for defining bold text.
- **<sub>:** It is used for defining subscripted data, etc.

HTML Page Structure

Below is a visualization of an HTML page structure:



Cascading Style Sheet

Cascading Style Sheets is a style sheet language used for describing the presentation of a document written in a markup language such as HTML or XML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript. CSS is designed to enable the separation of content and presentation, including layout, colors, and fonts

<Practical>

Macromedia Fireworks

Adobe Fireworks (formerly Macromedia Fireworks) was a bitmap and vector graphics editor, which Adobe acquired in 2005. Fireworks was made for web designers for rapidly creating website prototypes and application interfaces. Its features included slices, which are segments of an image that are converted to HTML elements, and the ability to add hotspots, which are segments of an image that are converted to hyperlinks.

<Practical>

Macromedia Dreamweaver

Dreamweaver is an application that lets you design, code, and manage websites. What is interesting about the software is that it offers both the possibility to write code as well as make a website using a visual interface.

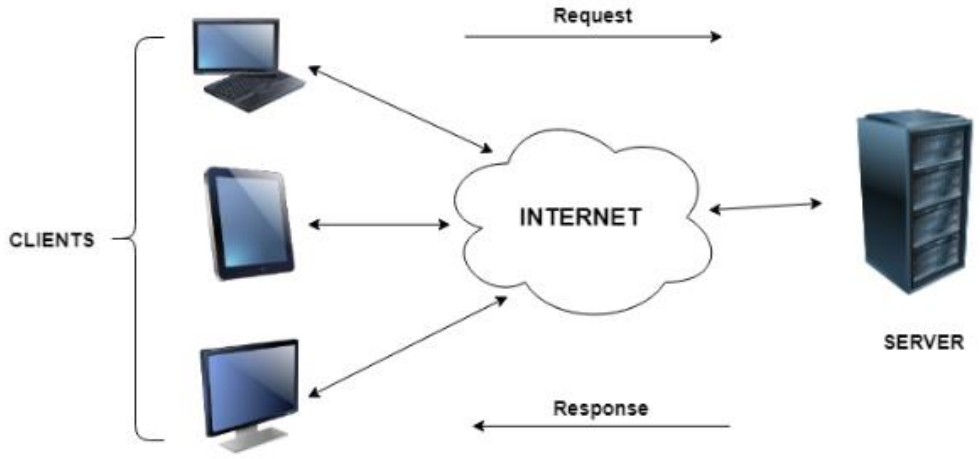
<Practical>

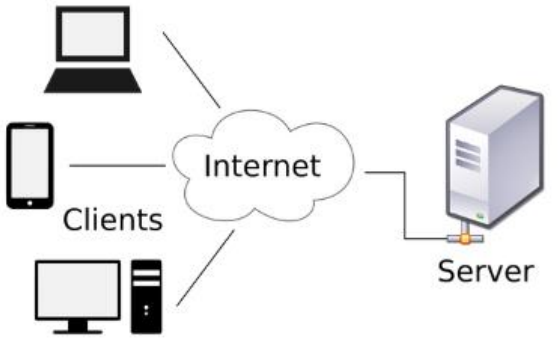
Client-Server Computing

In client-server computing, the clients request a resource and the server provides that resource. A server may serve multiple clients at the same time while a client is in contact with only one server. Both the client and server usually communicate via a computer network but sometimes they may reside in the same system.

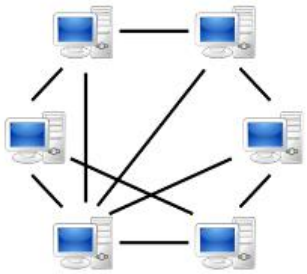
<Practical>

An illustration of the client-server system is given as follows −





Client-Server



Peer-to-Peer

Dynamic Web Application Using PHP

1. Preparing the Database
2. Database Connection
3. Capturing User Input
4. Adding Records to the Database
5. Retrieving Records from the Database
6. Searching a Particular Records

7. Deleting Records