Concepts and Technologies for Internet and Web Programming

1. The Internet
   - Network Architecture
   - TCP/IP communication protocol: IP address, port number, socket, domain name, hostname, etc.
   - Applications on the Internet: World Wide Web (WWW, simply Web), email, instant messaging, ftp, news group, etc.

2. The Web – a platform for running applications on the Internet
   - Infrastructure for Web-based Applications
     - Web server: A Web Server is software application that uses the HyperText Transfer Protocol. A Web Server is usually run on a computer that is connected to the Internet. There are many Web Server software applications, including public domain software from Apache, and commercial applications from Microsoft, Oracle, Netscape and others. A Web Server may host or provide access to Content and responds to requests received from Web browsers. Every Web Server has an IP address and usually a domain name.
     - Application server: A software server that lets clients use applications and databases that are managed by the server. The application server handles all the application operations and connections for the clients.
     - Database server: A database installed as a back-end or server component of a client-server system, which can be accessed over a LAN by one or more client, or front-end applications through the use of query language, typically SQL. The server part of the program is responsible for updating the records, ensuring that multiple accesses are available to authorized users, protecting the data and communicating with other servers holding relevant data. The client end of the program requests records and then modifies them, while the server tracks records down for the client and adds new ones. Oracle, MS SQL Server, Sybase, and MySQL are popular RDBMS used for database server.
     - Web browser: Software that gives a user access to the World Wide Web. Web browsers provide a graphical interface that lets users click buttons, icons, and menu options to view and navigate Web pages. Microsoft Internet Explorer and Mozilla Firefox are popular Web browsers.
   - Necessary technologies:
     - HTTP (HyperText Transfer Protocol): The protocol for moving hypertext files across the Internet. Requires an HTTP client program on one end (web browser), and an HTTP server program on the other end (web server)
     - URI (Uniform Resource Identifier): A string of characters used to identify a name or a resource on the Internet.
     - HTML (HyperText Markup Language): The coding language used to create Hypertext documents for use on the World Wide Web. In HTML we can specify that a block of text, or a word, is linked to another page on the Internet. HTML files are meant to be viewed using a World Wide Web Client Program – a browser, such as IE, Firefox, Mozilla, Chrome, or others.
     - XHTML (Extensible Hypertext Markup Language): A reformulation of HTML 4.0 in XML 1.0. XHTML is a new language for building web pages that has recently been proposed as a W3C Recommendation.
HTML5: the latest standard of Hypertext Markup Language, which has added advanced interactive features, such as allowing video to be embedded on a web page. It is gaining in popularity compared to proprietary standards, like Adobe Flash, because it is an open standard and does not require third-party plugins. Using HTML5 will allow web pages to work more like desktop applications.

CSS (Cascading Style Sheets)/CSS3: a W3C standard that is attached to Web documents to describe how the document is displayed

JavaScript: a client-side script language running in web browser

Server Side Programming Languages
- CGI (Common Gateway Interface), Perl and others
- Server-side Scripting : PHP (PHP Hypertext Preprocessor), ASP (Active Server Page)
- .NET: ASP .NET with C#, and VB
- J2EE: Java Servlets, JavaServer Pages (JSP), JDBC, and others
- Ruby on Rails
- and so on

Database and XML: date storage and retrieval

Web 2.0 technologies: Ajax, syndication (RSS), web services, mashups, maps, etc.

CMS: Content Management System

3. Web Development Tools
- Web authoring tools: Microsoft Expression Web, Adobe Dreamweaver, etc.
- Graphics and animation tools: Adobe PhotoShop, Fireworks, Flash; etc.
- Microsoft Visual Studio 2010 (ASP.NET)
- IBM WebSphere, Sun’s Java Application Server, etc. (J2EE)
- Adobe ColdFusion (tag-based)
- Zope.org’s Zope (Web-based)
- CMS : content-based
- And so on

4. Web Application Development In DIFD
- DIFD 141, CSCI 241, CSCI 242, CSCI 355, and CSCI 441.