COURSE OUTLINE

CMSY-151
Principles of Internet II (Professional)
3 Semester Hours

HOWARD COMMUNITY COLLEGE

Description

This course covers skills and knowledge required for entry-level careers working with the Internet. Students who successfully complete the class will gain a knowledge of internet client applications, Web programming and development, computer networking infrastructure of the internet, internet security and e-commerce technology and business concepts. This knowledge is tested in the CompTIA i-Net+ certification exam. Prerequisite: CMSY-129. (3 hours weekly)

Overall Course Objectives

Upon completion of this course, the student will be able to:

1. Have the knowledge and skills to use and update internet client software.
2. Have knowledge of the differences between popular client and server programming languages, including those for wireless devices.
3. Understand the networking infrastructure of the internet, including networking hardware and protocols, application and other servers, and the domain name system.
4. Understand common tools for connecting a database to a web site.
5. Understand various security threats and methods of protection, including Denial of Service attacks, firewalls, encryption and authentication methods and common protocols that use them.
6. Identify e-business models, protocols and programming languages used in e-business, networking and security issues in different e-business models.
7. Understand the basics of the major legal/regulatory issues of e-commerce.

Major Topics

I. Internet Basics and Clients
   - A. Elements of the infrastructure needed to support Internet clients
   - B. Caching: Implications for performance and content, client side vs. server side, proxy caching
   - C. Search indexes: static, keyword, and full-text
   - D. Internet client infrastructure: Internet application software configuration, TCP/IP configuration, network connection, modem and NIC configuration, DHCP
   - E. Installing client software with patches and updates

II. Web Site Development – Understand and be able to describe:
   - A. Programming-related terms: API, CGI script, SQL, server-side includes, client-side scripting
   - B. Server-side dynamic programs: Java, JSP Java Servlets, ASP, PHP, CGI script, Perl, XML, XSL, DTD, JavaScript, VBScript
   - C. How to create HTML pages: cross-browser coding, CSS, XHTML, DHTML, use of Meta Tags, coding tables, headings, and forms
   - D. Plug-ins for playing multimedia
   - E. Characteristics of image formats and implications for use: GIF, JPEG, PNG, PDF, AVI, BMP and others
   - F. Database connectivity to web servers and the 3 tier model

III. Networking
- A. Hardware components from the client to server: NIC, Modems, CSU/DSU, Repeater, Firewall, Hub, Switch, Proxy Server, NAT Server, Router
- B. Network topologies and implications for media and transmission methods
- C. Functions of Internet servers: E-mail, Web, FTP, News, Proxy, Caching, Media, DNS, Certificate, Directory Server
- D. Protocols used by Internet Servers
- E. Remote access protocols
- F. Protocols and their functions within the TCP/IP stack
- G. TCP/IP troubleshooting utilities

IV. Security
- A. Encryption – symmetric vs. asymmetric public key encryption
- B. Access control and strong password characteristics
- C. Authentication and digital certificates
- D. Secure Socket Layers (SSL)
- E. S/MIME
- F. Secure Electronic Transactions (SET)
- G. Denial of Service attacks, including Ping floods, Mail flooding, Syn floods, IP Spoofing
- H. Firewalls, including Port filtering, packet filtering, application filtering
- I. Firewall configuration, including DMZ, bastion host, three-homed firewalls
- J. Viruses, Worms, Trojan Horses, and the use of anti-virus software
- K. Physical security and procedures

V. Business Concepts
- A. Business models on the Internet, including DotCom vs. Click and Mortar, business-to-consumer, business-to-business, business-to-government, consumer-to-consumer
- B. Network configuration options, including private network, intranet, extranet, and Internet
- C. Payment processing methods, EFT, credit card and SET, and online Wallet
- D. B2B protocols, including EBT, EDI, OBI, and OTP
- E. Portals
- F. Auctions
- G. Legal issues including copyright, trademark, and taxation

Course Requirements

Specific assignments and procedures for evaluating student performance in the class will be described in the individual class syllabus, but will include the following:

1. Written tests on definitions and procedures.
2. Computer tests to demonstrate skills in using troubleshooting software and configuring clients.
3. Creating diagrams of network configuration.

Other Course Information

This course is a business elective.