AUSTIN COMMUNITY COLLEGE
CONTINUING EDUCATION

TCP/IP

(18 hours)

ITNW 6032, 6045

COURSE SYLLABUS

Course Description: Introduces TCP/IP (Transaction Control Protocol/Internet Protocol) fundamentals. Overview of Internet communication and basic protocols such as: ARP, DNS, HTTP, FTP, email, and others. Discusses addresses, sockets, naming, networks, optimization of web sites. Should assume the need for outside reading. Prerequisites: be able to browse the web, be able to send and receive email.

Objectives: Every student will be able to:

- Explain the packet nature of TCP/IP communications
- Summarize the history of TCP/IP networking
- Describe the value of open source, in its use as an engineering process and impact on network security
- Describe briefly how IP addressing works
- Describe briefly how the Domain Name System works Describe an overview of TCP/IP network routing
- Design a TCP/IP network for a typical small business
- Describe the purposes of the protocols: IP, TCP, UDP, DNS, ARP, DHCP, FTP, TELNET, NFS
- Describe the purposes of the email protocols: SMTP, POP, IMAP
- Manually (using a telnet program) send an email message
- Describe the purposes of the HTTP protocol
- Describe the interactions required between a web browser and web server to read and render a web page
- Manually (using a telnet program) read a page from a web server
- Explain the basic security issues in TCP/IP networking
- Describe the differences between firewalls, application gateways, and other security measures

Rational: TCP/IP in the fundamental communications protocol used by web servers and web browsers and all other Internet communications. Efficient and effective use of the Internet relies on effective use and understanding of TCP/IP communications.


Type of Course: Short course delivered in online format.

Evaluation: Students will be evaluated for their understanding of TCP/IP networking issues through quizzes and exercises. These will be structured in a way so that the student has to complete the exercise correctly to be able to return the correct answer.

Course Outline:

I. Internetworking 4 hours
   A. Packet-Based Communications
   B. History of TCP/IP

II. Network Essentials 2 hours
    A. IP and Addressing
    B. TCP and Sockets
    C. DNS and Naming

III. Network Routing 3 hours
    A. TCP/IP Networks and Addressing
    B. Example Network: Acme Company
    C. A Tangle of Hardware
    D. Router Protocols

IV. Protocols 3 hours
    A. Common Protocols
    B. Networking Support: ARP, DHCP, ICMP, SNMP, etc.
    C. TCP and UDP
    D. Data Protocols: Telnet, FTP, NFS, etc.
V. Killer App #1: Email  
   A. SMTP Protocol  
   B. Remote Email Access: POP, IMAP  
   C. Email Lists, News Groups

VI. Killer App #2: World Wide Web  
   A. HTTP Server: A Web Server's Job  
   B. HTTP Client: A Web Browser's Job  
   C. Servlets, Proxies, Robots

VII. Network Security  
   A. What Is Security?  
   B. Network Security Issues  
   C. Mechanisms: Firewalls, Application Gateways, VPNs, etc.  
   D. Application Layer Exploits

Student Assessment Checklist:

At the completion of this course a student will be able to:

- Explain the packet nature of TCP/IP communications  
- Summarize the history of TCP/IP networking  
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- Describe briefly how IP addressing works  
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- Describe an overview of TCP/IP network routing  
- Design a TCP/IP network for a typical small business  
- Describe the purposes of the protocols: IP, TCP, UDP, DNS, ARP, DHCP, FTP, TELNET, NFS  
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