CSIT 3355 - NETWORK ADMINISTRATION

CREDIT HOURS: 3
PREREQUISITES: CSIT 3353
GRADE REMINDER: Must have a grade of C or better in each prerequisite course.

CATALOG DESCRIPTION

Network Administration principles, tools and techniques, including network installation, configuration, operation and maintenance. Exploration of current issues, topics and trends in network development. May not be used to satisfy computer science requirements for a major or minor in computer science or computer information systems.

PURPOSE OF COURSE

The purpose of this course is to enable the student to develop an understanding of the principles of networks and the skills required to install, configure, and manage those networks. The concepts, terminology, techniques, and tools of computer networking will be presented. Responsibilities and legal, ethical, and professional issues will be addressed. Current practices and platforms will be explored.

EDUCATIONAL OBJECTIVES

Upon successful completion of the course, students should be able to:

1. Demonstrate an understanding of the computer networking field through identification of models, concepts, and technologies.

2. Demonstrate a thorough understanding of the procedures required to install, configure, and maintain computer networks.

3. Identify user requirements and activities.

4. Identify the tools and techniques of computer networking.

5. Describe relevant current practices, procedures and policies in the computer networking field.

COURSE CALENDAR

This course meets for a minimum of 37.5 lecture contact hours during the semester. Students have significant weekly extracurricular assignments which involve readings, operating system configuration, virtual machine creation, programming, or engaging in other forms of preparation. Students are expected to complete 4-5 major homework assignments related to the above topics as well as multiple in-class laboratory assignments involving configuring and testing a raspberry pi, analyzing packet captures in Wireshark, programming assignments, and 2-3 periodic exams in addition to the final exam.. Students are expected to prepare for any class assignments or quizzes over the material covered in class or the extracurricular assignments. Successful completion of these activities requires at a minimum six additional hours of outside of classroom work each week.

CONTENT   HOURS

Overview: network to internetwork 3
    Goals, Services, Terminology
    Designing and Planning

Network Technology Β Systems, Components, Media
Environment Β Corporate, Personnel, Responsibility Issues

Models & Protocols 3
    OSI stack: the model
    Ethernet & TCP/IP: the actuality

Ethernet: the link...10
    History
    Current practice
    Framing
    Hubs, bridges, switches

IP: network to network..6
    Interface: ARP/RARP
    ICMP, ping
    IP addressing, subnetting
    Routing, packet header: TTL, addresses

TCP: host to host..6
    Connectionless/connection-oriented, datagram/streams
    Error correction, flow control
    Interface: Ports

Application: message to packet 7
    Packetizing, headers
    DNS, DHCP, FTP, Telnet/SSH, Mail
    SNMP

Wireless LANs..3

Security 2
    Packet sniffers/Protocol analyzers

Process and Policies..2
    Administration and User Responsibilities
    Applications Β Installation and Configuration
    Training
    Analysis and Tuning

Exams (plus final)...3

                                                      TOTAL   45

REFERENCES

Barnes, D., and Sakandar, B., Cisco LAN Switching Fundamentals, 2nd Ed., Cisco Press, 2004.

Burns, K., TCP/IP Analysis and Troubleshooting Toolkit, Wiley, 2003.

Halsall, F., Computer Networking and the Internet, 5th Ed., Addison-Wesley, 2005
      http://www.aw-bc.com/catalog/academic/EZPrint_Product/0,2989,0321263588,00.html

Forouzan, B., Local Area Networks, McGraw-Hill, 2002.

Forouzan, B., TCP/IP Protocol Suite, 2nd Ed., McGraw-Hill, 2002.

Hall, E., Internet Application Protocols: the Definite Guide, O'Reilly & Associates, 2003.

Hall, E., Internet Core Protocols: the Definitive Guide, O'Reilly & Associates, 2000.

Held, G., Ethernet Networks: Design, Implementation, Operation, Management, 3rd Ed., Wiley & Sons, 1998.

Held, G., Managing TCP/IP Networks: Techniques, Tools, and Security, Wiley & Sons, 2000.

Hunt, C., and Bragg, R., Windows Server 2003 Network Administration, O'Reilly & Associates, 2005.

Liebeherr, j., and El Zarki, M., Mastering Networks: An Internet Lab Manual, Addison-Wesley, 2004
      http://www.aw-bc.com/catalog/academic/EZPrint_Product/0,2989,0201781344,00.html