Computer Information Systems Department

CET 1600 – Networking Fundamentals

Course Description – This is the first course of the four-course Cisco curriculum that will lead the student toward the goal of achieving professional certification as a Cisco Certified Network Associate (CCNA). Instruction includes networking, network terminology and protocols, network standards, LANs, WANs, the OSI reference model, cabling, cabling tools, routers, router programming, LAN/WAN topologies, IP addressing and network standards. Students will install, configure and operate simple-routed LAN, routed WAN and switched LAN networks. Prerequisites: CGS 1060 and CGS 1560 or a working knowledge of the Microsoft operating system and Microsoft Office applications suite. Operational understanding of the following microcomputer topics: operating systems, memory, hard disks, types of central processing units (CPUs), communications ports, printer ports, display adapters, and pointing devices. Laboratory fee. (3hr. lecture; 2hr lab)

Course Competencies

Competency 1: The student will demonstrate an understanding of the OSI reference model by:

a. Identifying the seven layers of the OSI reference model
b. Describing the functions of each layer of the OSI reference model

Competency 2: The student will demonstrate an understanding of the essentials of network communication by:

a. Describing data packets
b. Describing source and destination addresses

Competency 3: The student will demonstrate an understanding of the data link and network addresses by:

a. Describing data link and network addresses
b. Identifying key differences between them

Competency 4: The student will demonstrate an understanding of internetworking by:

CET 1600 – Networking Fundamentals

a. Naming and identifying internetworking devices
b. Defining and describing network segments
c. Describing the differences between repeaters and bridges
d. Evaluating the advantages and disadvantages of using repeaters
e. Evaluating the advantages and disadvantages of using bridges
f. Identifying and describing collisions

Competency 5: The student will demonstrate an understanding of layered models by:

a. Describing a layered model
b. Evaluating the purpose of layered model use
c. Identifying key reasons why the industry uses a layered model

Competency 6: The student will demonstrate an understanding of encapsulating data by:

a. Describing data encapsulation
b. Evaluating the purpose of data encapsulation
c. Identifying the five conversion steps of data encapsulation

Competency 7: The student will demonstrate an understanding of TCP/IP by:

a. Describing Transmission Control Protocol (TCP)
b. Describing Internet Protocol (IP)
c. Evaluating the differences between the two protocols
d. Describing the different classes of IP addresses
e. Designing and implementing subnetting
f. Describing the use of Address Resolution Protocol (ARP)
g. Comparing and applying previously learned content to ARP including encapsulation, frames, packets, the OSI model, and broadcasts

Competency 8: The student will demonstrate an understanding of the problems and solutions associated with various types of network media by:

a. Describing the various types of network media
b. Discussing the advantages and disadvantages of each type of media

CET 1600 – Networking Fundamentals

c. Describing problems associated with crosstalk, electromagnetic interference, and radio frequency interference
d. Selecting the appropriate media based on the advantages and disadvantages applicable to the scenario being evaluated
e. Assembling networking cables using common standards

Competency 9: The student will demonstrate an understanding of various local area network (LAN) topologies by:

a. Describing the various LAN topologies
b. Describing the appropriate cabling standards for each topology
c. Designing and implementing a LAN based on a proposed system including; describing the appropriate topology, selecting an appropriate wiring design, and defending the design

Competency 10: The student will demonstrate an understanding of Ethernet frames by:

a. Describing a preamble
b. Identifying and locating the source and destination addresses
c. Describing the criteria used to judge the contents of a frame

Competency 11: The student will demonstrate an understanding of Ethernet reliability by:

a. Identifying network standards applicable to reliability
b. Defining and describing the concept of reliability
c. Describing CSMA/CD applicability to reliability