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Course Outline for CIS 66

NETWORKING FUNDAMENTALS

Effective: Fall 2008

I. CATALOG DESCRIPTION:
CIS 66 — NETWORKING FUNDAMENTALS — 3.00 units

This course is a foundation course that explains and describes how computer networks are designed, installed, and administrated. Introduction to communications concepts, home networks (Broadband & DSL) data communications, networking, and internetworking. Review of major network components: hardware (hub, switch, router, repeater, gateway), software, protocols (TCP/IP, IPX.SPX, NETBEUI), topologies (Ethernet Token-Ring, FDDI, other LANs), and cabling. Overview of LAN administration, setup, and installation. Students will install and run HTTP, DNS, FTP servers, a secure VPN, a remote connection, and various monitoring tools. Preparation for the CompTIA Network+ certification exam. Students may receive credit for either Computer Information Systems 66 or Computer Networking Fundamentals 52, but are limited to a total of two times in any combination for credit.

3.00 Units Lecture

Strongly Recommended
CIS 50 - Intro to Computing Info Tech

Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lecture Hours:	54.00
No Unit Value Lab	18.00
Total Hours:	72.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 2

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering this course, it is strongly recommended that the student should be able to:

A. CIS50

IV. MEASURABLE OBJECTIVES:

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

A. Describe the basic components of networks;
B. Define data communication and network terminology;
C. Identify the responsibilities of a LAN system administrator;
D. List and define layers of the OSI model;
E. Identify and describe current relevant IEEE network standards;
F. Illustrate typical network topologies;
G. Describe the major functions of LAN hardware protocols such as Ethernet, token ring, FDDI.

V. CONTENT:
A. Introduction to data communication concepts and networking
   1. Birth of networking
   2. Goal of networking
   3. Types of networks: p2p, client server, LANs, MANs, WANs
B. Network standards and the OSI Model
   1. Networking Standards Organizations: EIA, TIA, IEEE, ISO
   2. OSI Model: 7 layers
   3. Applying the OSI Model
   4. IEEE network specifications
C. Transmission Basics and Networking Media
   1. Transmission basics: analog v digital
   2. Common media characteristics
   3. Cabling: coaxial, twisted pair, fiber
   4. Cable design and management

5. Installing cable
6. Wireless transmissions

D. Network Protocols
1. Define protocols
2. TCP/IP
3. IPX/SPX
4. NetBIOS and NetBEUI
5. Apple Talk
6. Binding protocols on a Windows workstation

E. Networking Hardware
1. NICs
2. Repeaters and Hubs'
3. Bridges
4. Switches
5. Routers
6. Gateways

F. Topologies and Access Methods
1. Physical Topologies: bus, ring, star
2. Hybrid physical topologies
3. Backbone networks
4. Logical topologies
5. Switching
6. Ethernet: CSMA/CD
7. Token Ring
8. FDDI
9. ATM
10. Wireless Networks: 802.11, Bluetooth, Infared

G. WANs, Internet Access, and Remote Connectivity
1. WAN essentials
2. WAN topologies: bus, ring, star, meshed, tiered
3. PSTN
4. X.25 and frame relay
5. ISDN
6. T-Carriers
7. DSL
8. Broadband cable

H. Network Operating Systems and Windows Server-based networking
1. Intro to network operating systems
2. NOS services and features
3. Intro to Windows Server
4. Installing and configuring a Windows Server
5. Internetworking with other NOS

I. TCP/IP Networking
1. Designing TCP/IP based networks
2. IP addressing, sub netting
3. TCP/IP mail services: SMPT, MIME, POP
4. TCP/IP Utilities
5. VoIP

J. Troubleshooting Network Problems
1. Troubleshooting methodology
2. Troubleshooting tools

K. Ensuring Integrity and Availability
1. Define integrity and availability
2. Viruses
3. Fault Tolerance
4. Data backup
5. Disaster Recovery
6. Troubleshooting tools

L. Network Security
1. Security audits
2. Security risks
3. Effective security policy
4. Physical security
5. NOS security
6. Encryption
7. Wireless network security

M. Implementing and Managing Networks
1. Project management
2. Network management
3. Software changes
4. Standard networking forms
5. Hardware and physical changes

N. Network + Exam
1. Exam objectives
2. Practice exam

VI. METHODS OF INSTRUCTION:
A. **Lecture** -
B. Periodic examinations and quizzes
C. **Discussion** -
D. Videos, reading assignments, tutorials
E. Overhead projector foils to introduce concepts
F. **Lab** -
G. **Demonstration** -

VII. TYPICAL ASSIGNMENTS:
A. Identify installed protocols and and/delete protocols B. Use scenarios to design appropriate networks for home, small office, or large office C. Take mock Network = test to check understanding

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Quizzes
3. Group Projects
4. Class Participation
5. Other:
    a. Method:
        1. Quizzes and final examination: Typical questions: Objective
            a. Which of the following cable types can be used in a Token Ring network? (Choose all that apply).
                1. STP
                2. Thinnet coaxial
                3. UTP
                4. Fiber-optic
            b. Passwords provide security for your network from unauthorized access. What are three policies you can set for passwords that will help protect your network?
        2. Graded assignments, such as Internet research and group projects
        3. Attendance and participation

B. **Frequency**

1. Frequency:
    a. Two to three quizzes and a final examination
    b. Weekly assignments to reinforce network concepts

IX. TYPICAL TEXTS:

1. Dean *Network+ Guide to Networks.* 4th ed., Course Technology, 2006.
2. Matthews *Computer Networking: Internet Protocols in Action.* 1st ed., Wiley, 2007.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Mobile storage device: flash drives, CD RW, diskettes
B. Computer Lab PRINT FEE CARD