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Course Outline for CIS 9102

NETWORK TECHNOLOGY FOUNDATIONS

Effective: Fall 2011

I. CATALOG DESCRIPTION:
CIS 9102 — NETWORK TECHNOLOGY FOUNDATIONS — 1.50 units

Network Technology Foundations is an accelerated networking course designed to teach essential networking concepts, skills, and practices. Identify various network components and protocols that enable users to share data. Explore different types of transmission media, and how network architecture and topologies provide for efficient and secure communication. Review the OSI reference model and its relationship to packet creation, and compare and contrast the OSI model with the Internet architecture model. Study the functions and features of internetworking server types, and the benefits of implementing a Content Management System (CMS). Learn about the importance of routing, and explore IP addressing, IP address classes and subnet masks. Review essential network security concepts, Internet-based challenges facing today's users, and methods you can use to secure networks and network transmissions, including authentication, encryption and firewalls. NOTE: This course is one of a series in the Certified Internet Web Professional (CIW: www.ciwcertified.com) program.

1.00 Units Lecture 0.50 Units Lab

Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lecture Hours:	18.00
Lab Hours:	27.00
Total Hours:	45.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 4

III. PREREQUISITE AND/OR ADVISORY SKILLS:

IV. MEASURABLE OBJECTIVES:

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

A. Demonstrate knowledge of basic data communications components, and demonstrate technical knowledge of the Internet
B. Identify the role of networking hardware, and configure common hardware for operation
C. Identify the relationship between IP addresses and domain names, including assignment of IP addresses within a subnet
D. Identify the functions and components of servers commonly used on the Internet
E. Identify common Internet security and availability issues, including user-level and enterprise-level concerns
F. Identify common performance issues affecting Internet clients, including analysis, diagnosis
G. Demonstrate understanding of virtualization
H. Explain concepts involving personal privacy protection on the Internet

V. CONTENT:
A. Introduction to Networking
1. Overview of Networks and Protocols
2. Telephony and Convergence Networking
3. Networking Evolution
4. Client/Server Model
5. Network Operations Center (NOC)
6. Networking Categories
7. Network Topologies
8. Network Operating System
9. Microsoft Windows Servers
10. UNIX/Linux
11. The Need for Protocols
12. OSI Reference Model
13. Data Encapsulation
14. Packets
15. OSI/RM Protocol Examples
16. TCP/IP
17. IPX/SPX
18. Binding Protocols
19. Local Area Network (LAN)

20. Wide Area Network (WAN)
21. Internet Exchange Point (IXP)
22. Common Network Components
23. Transmission Media
24. Wireless Network Technologies
25. Transmission Types
26. IEEE LAN Standards
27. T-Carrier System, E-Carrier System, SONET/SDH
28. Downloading Files with BitTorrent
29. Virtualization

B. TCP/IP Suite and Internet Addressing
1. Introduction to TCP/IP
2. Internet Architecture
3. Requests for Comments (RFCs)
4. Internet Protocols
5. Demultiplexing
6. Introduction to Routing
7. Routing Protocols
8. Port Numbers
9. Internet Addressing, Subnet Mask, Internet Address Classes
10. Internet Protocol Version 6 (IPv6)
11. System Configuration and IP Addresses
12. Diagnostic Tools for Internet Troubleshooting

C. Internetworking Servers
1. Overview of Internetworking Servers
2. File and Print Servers
3. HTTP Server Essentials
4. Servers : Database Servers, Proxy Servers, Mail Servers
5. Instant Messaging (IM)
6. Mailing List Servers
7. Media Servers, DNS Servers, FTP Servers
8. News Server
9. Certificate Server
10. Directory Server
11. Catalog Server
12. Fax Server
13. Transaction Server
14. Choosing Web Server Products
15. Content Management Systems (CMS)

D. Hardware and Operating System Maintenance
1. Basic Hardware and System
2. Maintenance
3. Motherboard
4. IRQs, I/O Addresses and DMA
5. Mass Storage Device Interfaces
6. Network Interface Card
7. Common Peripheral Ports
8. Power Requirements
9. Optical Discs
10. TV Tuner Card
11. HDMI Connections
12. Mobile Computing
13. Netbooks
14. Client Operating System
15. Management
16. Software Licensing
17. Partitions and Logical Drives
18. File System Types
19. File System Management Tools
20. Troubleshooting Software Remote Management and

E. Network Security and Personal Privacy Protection
1. Importance of Network Security
2. Viruses and Worms
3. Overview of Network Attack Types
4. Defeating Attacks
5. Authentication
6. Encryption
7. Firewalls, Firewall Topologies
8. Security Zones
9. Virtual Private Network (VPN)
10. Security Audit
11. Uninterruptible Power Supply (UPS)
12. Personal Privacy and the Internet
13. Personal Protection and the Internet

VI. METHODS OF INSTRUCTION:
A. Lecture and classroom discussion
B. Computer demonstrations with overhead display panel
C. Read text and other supplemental sources (example, Internet sites)
D. Discussion boards
E. PowerPoint presentations
F. Chat rooms
G. Lab experience: hands-on lab assignments

VII. TYPICAL ASSIGNMENTS:
A. Lecture 1. Interests, Aptitudes, and Career Exploration 2. Major Networking Protocols: TCP/IP, IPX/SPX, NetBeui, AppleTalk B. Reading 1. Read the chapter on TCP/IP Suite and Internet Addressing 2. Read the U.S. Department of Labor Bureau of Labor Statistics Occupational Outlook Handbook network security jobs C. Hands-on lab assignment; use a P2P network to search for and download files

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Quizzes
3. Class Participation
4. Lab Activities
5. Other:
    a. Methods
        1. Quizzes and final examination
        2. Graded hands-on lab assignments
        3. Relevant active participation

B. **Frequency**

1. Frequency
    a. Chapter quizzes, examinations (mid-term, final)
    b. Weekly hands-on lab assignments to reinforce and demonstrate mastery of the various tools

IX. TYPICAL TEXTS:

1. Amstuz, Irina, and Ken Kozakis *Network Technology Foundations v2.0.*, ComputerPrep, 2009.
2. Tomsho, Greg *Guide to Networking Essentials*., Course Technology, 2009.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Mobile storage device: web storage, flash drives, CD RW
B. Access to the World Wide Web with any major Web browser