

Microsoft Networking Essentials

Course Design

2001-2002

Course Information

Organization: EASTERN ARIZONA COLLEGE

Division: Business

Course Number: CMP 141

Title: Microsoft Networking Essentials

Credits: 3

Developed by: Mike Moore

Lecture/Lab Ratio: Three (3) lecture hours per week

Transfer Status: Non-transferable

Extended Registration

Class: No

CIP Code: 11.1001

Assessment Mode: Pre/Posttest (60 Questions, 60 Points)

Semester Taught: Offered upon request.

Gen. Ed. Area: None

Separate Lab: No

Awareness Course: No

Intensive Writing

Course: No

Prerequisites: 1. None

Educational Value: The major purpose of this course is to prepare students to pass Microsoft Networking Essentials exam. This course would also be helpful to all others employed or planning to be employed in a networking environment. All basic aspects of networking are covered.

Goals:

1. Analyze local area network (LAN) requirements and implementation.
2. Design a LAN including cable type, topology, and protocols.
3. Evaluate advantages and disadvantages of LAN extension technologies.
4. Troubleshoot LAN problems.

Description: Emphasis on local area networks with an overview of wide area networks. Includes terminology, hardware and software components, network architecture, packet structure, topologies, communication standards and protocols, and security issues. Preparation for Microsoft certification examination.

Textbooks: Microsoft Press. *Networking Essentials*. Second. Microsoft Press, 1998.
This textbook is required. Source: EAC Bookstore.

Supplies: Access to a computer during the course

Competencies and Performance Standards

1. Identify the elements common to every network.			
<i>Domain--Cognitive</i>	<i>Level--Application</i>	<i>Importance--Essential</i>	<i>Difficulty--Medium</i>
<p>Criteria--Criteria - Performance will be satisfactory when:</p> <ul style="list-style-type: none"> • learner participates in general class discussions and activities . • learner provides acceptable written responses to the Q & A and Chapter Checkup. • learner participates in class discussions and activities related to the Case Study, Troubleshooter, and LAN Planner. • learner participates in Lab 2 (Sharing Directories). 	<p>Conditions--Competence will be demonstrated:</p> <ul style="list-style-type: none"> • in completion of the Question and Answer sections in each lesson in the text. • in completion of the Chapter Checkup. • in choosing one of the correct solutions to the text Case Study problem. • in solving the Troubleshooter problem in the text. • in choosing a reasonable network topology in the LAN Planner section of the text. • in completion of Lab 2 (Sharing Directories). 	<p>Learning Objectives:</p> <ol style="list-style-type: none"> Identify the components of a local area network. Describe the advantages of networking. Identify a peer-to-peer network. Identify a server-based network. Identify server functions and assign servers as needed. Determine which type of network would be appropriate for your site. Identify the three standard topologies and their variations. Describe the advantages and disadvantages of each topology. Determine an appropriate topology for a given network plan. 	

2. Explain how servers, clients, and peripherals are physically connected.			
<i>Domain--Cognitive</i>	<i>Level--Evaluation</i>	<i>Importance--Essential</i>	<i>Difficulty--Medium</i>
<p>Criteria--Criteria - Performance will be satisfactory when:</p> <ul style="list-style-type: none"> • learner participates in general class discussions and activities. • learner provides acceptable written responses to the Q & A and Chapter Checkup. • learner participates in class discussions and activities related to the Case Study, Troubleshooter, and LAN Planner. 	<p>Conditions--Competence will be demonstrated:</p> <ul style="list-style-type: none"> • in completion of the Question and Answer sections in each lesson in the text. • in completion of the Chapter Checkup. • in choosing one of the correct solutions to the text Case Study problem. • in solving the Troubleshooter problem in the text. • in choosing a reasonable network topology in the LAN Planner section of the text. 	<p>Learning Objectives:</p> <ol style="list-style-type: none"> a. Define terms related to cabling including shielding, crosstalk, attenuation, and plenum. b. Identify the primary types of network cabling. c. Distinguish between baseband and broadband transmissions and identify appropriate uses for each. d. Determine which type of cabling and connection hardware would be appropriate for a particular network environment. e. Identify the three types of wireless networks and the uses of each. f. Describe the four transmission techniques used in local area networking. g. Describe the three types of signal transmission used in mobile computing. h. Describe the role of the network adapter card in a network including preparing, sending, and controlling data. i. Describe the configurable options for network adapter cards. j. List the primary considerations for selecting a network adapter card k. Describe at least two enhancements to network adapter cards that will improve network performance. 	

3. Determine how networks are implemented following standards.			
<i>Domain--Cognitive</i>	<i>Level--Application</i>	<i>Importance--Essential</i>	<i>Difficulty--High</i>
<p>Criteria--Performance will be satisfactory when:</p> <ul style="list-style-type: none"> • learner participates in general class discussions and activities. • learner provides acceptable written responses to all the Q & A and Chapter Checkup. • learner participates in class discussions and activities related to the Case Study, Troubleshooter, and LAN Planner. • learner participates in LAB 8 (Installing Network Adapter cards). 	<p>Conditions--Competence will be demonstrated:</p> <ul style="list-style-type: none"> • in completion of the Question and Answer sections in each lesson in the text. • in completion of the Chapter Checkup. • in choosing on of the correct solutions to the text Case Study problem. • in solving the Troubleshooter problem in the text. • in choosing a reasonable network topology in the LAN Planner section of the text. • in completion of LAB 8 (Installing Network Adapter Cards). 	<p>Learning Objectives:</p> <ol style="list-style-type: none"> Describe the primary function of each OSI layer. Identify the OSI layer at which a particular network activity takes place. Identify the OSI layer at which a particular network component functions. Describe the Project 802 enhancements to the OSI model. Describe the role of drivers in a network environment, including their place in the OSI model. Identify sources for different drivers. Describe how to select and implement drivers given a networking situation. Install, update and remove drivers. Define the term packet, including its function and components. Describe the contents and function of each packet component: header, data, and trailer. Describe how packets are sent across a network. Identify the function of protocols and protocols stacks. Describe the network processes which use protocols and how they use them. Map particular protocols to the appropriate OSI levels. Define access method. Describe a primary feature of each of the major access methods: CSMA/CD, CSMA/CA, Token passing, Demand priority. 	

4. Describe the four major network architectures.			
<i>Domain--Cognitive</i>	<i>Level--Analysis</i>	<i>Importance--Essential</i>	<i>Difficulty--Medium</i>
<p>Criteria--Performance will be satisfactory when:</p> <ul style="list-style-type: none"> • learner participates in general class discussions and activities. • learner provides acceptable written responses to the Q & A and Chapter Checkup. • learner participates in class discussions and activities related to the Case Study, Troubleshooter, and LAN Planner. 	<p>Conditions--Competence will be demonstrated:</p> <ul style="list-style-type: none"> • in completion of the Question and Answer sections in each lesson in the text. • in completion of the Chapter checkup. • in choosing one of the correct solutions to the text Case Study problem. • in solving the Troubleshooter problem in the text. • in choosing a reasonable network topology in the LAN Planner section of the text. 	<p>Learning Objectives:</p> <ol style="list-style-type: none"> a. Identify the standard Ethernet components. b. Describe the features of each IEEE Ethernet standard topology. c. Identify the cabling for a given IEEE Ethernet standard topology. d. Determine which Ethernet topology would be appropriate for a given site. e. Describe the features of a Token Ring network. f. Identify the major components of a Token Ring network. g. Determine the components needed to implement a Token Ring network at a given site. h. Identify the components and features of AppleTalk. i. Identify the components and features of ArcNet. 	

5. Summarize the major aspects of network operations.		
<i>Domain--Cognitive</i>	<i>Level--Comprehension</i>	<i>Importance--Essential</i> <i>Difficulty--Medium</i>
<p>Criteria--Performance will be satisfactory when:</p> <ul style="list-style-type: none"> • learner participates in general class discussions and activities. • learner provides acceptable written responses to the Q & A and Chapter Checkup. • learner participates in class discussions and activities related to the Case Study, Troubleshooter, and LAN Planner. • learner participates in Lab 15 (Installing a Network Operating System). 	<p>Conditions--Competence will be demonstrated:</p> <ul style="list-style-type: none"> • in completion of the Question and Answer sections in each less in the text. • in completion of the Chapter Checkup. • in choosing one of the correct solutions to the text Case Study problem. • in solving the Troubleshooter problem in the text. • in choosing a reasonable network topology in the LAN Planner section of the text. • in completion of Lab 15 (Installing a Network Operating System). 	<p>Learning Objectives:</p> <ol style="list-style-type: none"> a. Identify essential network OS components. b. Define preemptive & non preemptive multitasking. c. Describe the elements of client and server software. d. Define network services. e. Identify the major considerations in a network OS installation. f. Install Windows NT Server. g. Identify the steps for installing, using, and managing a shared printer. h. Identify the features and uses of e-mail and scheduling. i. Describe the purpose of each of the four primary e-mail and messages standards. j. Describe the considerations and steps needed to share applications on a network. k. Determine policies & procedures for implementing & managing an e-mail system. l. Define a client solution and a server solution for interoperability. m. Identify methods vendors use to integrate their products with those from other vendors. n. Determine which network OS's and redirectors would be appropriate for a given site. o. Describe the differences between client/server and centralized computing. p. List the six steps of the client/server process. q. Identify client & server functions. r. Determine if a client/server approach is appropriate for a given networking environment.

6. Distinguish the essential areas of network administration.		
<i>Domain--Cognitive</i>	<i>Level--Analysis</i>	<i>Importance--Important Difficulty--Medium</i>
<p>Criteria--Performance will be satisfactory when:</p> <ul style="list-style-type: none"> • learner participates in general class discussions and activities • learner provides acceptable written responses to the Q & A and Chapter Checkup. • learner participates in class discussions and activities related to the Case Study, Troubleshooter, and LAN Planner. • learner participates in Lab 20A (Creating and Deleting User Accounts). 	<p>Conditions--Competence will be demonstrated:</p> <ul style="list-style-type: none"> • in completion of the Question and Answer sections in each lesson in the text. • in completion of the Chapter checkup. • in choosing one of the correct solutions to the text Case Study problem. • in solving the Troubleshooter problem in the text. • in choosing a reasonable network topology in the LAN Planner section of the text. • in completion of Lab 20A (Creating and Deleting User Accounts). 	<p>Learning Objectives:</p> <ol style="list-style-type: none"> a. Describe the process for creating a user account. b. List and define the four types of group accounts. c. Determine the appropriate account types for a network. d. Create a user and a group account. e. Identify major sources of network problems. f. List potential bottlenecks in network performance. g. Describe SNMP. h. Develop a network performance monitoring plan. i. Describe the functions of the network monitor utility. j. Create appropriate network documentation. k. List the basic security requirements for any network. l. Describe the primary components to be considered for physical security. m. Describe the features of password-protected shares. n. Describe the features of access permissions. o. List the considerations for implementing a backup system. p. Determine an appropriate backup method and schedule. q. List the considerations for implementing a UPS. r. Describe the four main types of fault tolerance systems.

7. Explain the devices and technologies that expand a network.			
<i>Domain--Cognitive</i>	<i>Level--Evaluation</i>	<i>Importance--Important</i>	<i>Difficulty--Medium</i>
<p>Criteria--Performance will be satisfactory when:</p> <ul style="list-style-type: none"> • learner participates in general class discussions and activities. • learner provides acceptable written responses to the Q & A and Chapter Checkup. • learner participates in class discussions and activities related to the Case Study, Troubleshooter, and LAN Planner. 	<p>Conditions--Competence will be demonstrated:</p> <ul style="list-style-type: none"> • in completion of the Question and Answer sections in each lesson in the text. • in completion of the Chapter Checkup. • in choosing one of the correct solutions to the text case study problem. • in solving the Troubleshooter problem in the text. • in choosing a reasonable network topology in the LAN Planner section of the text. 	<p>Learning Objectives:</p> <ol style="list-style-type: none"> a. Define asynchronous and synchronous communications. b. Identify modem standards. c. Describe the two types of carriers for modem communications. d. Determine which type of modem would be appropriate for a given site. e. Describe the function of each of the following: Repeaters, Bridges, Routers, Brouters, Gateways. f. Determine when to expand a LAN. g. Determine which components would be appropriate in a given network expansion situation. h. Identify the features of analog and digital connectivity. i. Identify the features of packet-switching networks. j. Identify the major transmission components needed for a simple, single protocol WAN. k. Distinguish between the major carriers (common carriers) and determine which would be most appropriate in a given WAN. l. Identify the primary features of: ATM, ISDN, FDDI, SONET, SMDS. m. Determine which of the technologies in item (L) would be appropriate for a given network. 	

8. Troubleshoot and prevent common network problems.		
<i>Domain--Cognitive</i>	<i>Level--Analysis</i>	<i>Importance--Essential Difficulty--High</i>
<p>Criteria--Performance will be satisfactory when:</p> <ul style="list-style-type: none"> • learner participates in general class discussions and activities. • learner learner provides acceptable written responses to the Q & A and Chapter Checkup. • learner participates in class discussion and activities related to the Case Study, Troubleshooter, and LAN Planner. 	<p>Conditions--Competence will be demonstrated:</p> <ul style="list-style-type: none"> • in completion of the Question and Answer sections in each lesson of the text. • in completion of the Chapter Checkup. • in choosing one of the correct solutions to the text Case Study problem. • in solving the Troubleshooter problem in the text. • in choosing a reasonable network topology in the LAN Planner section of the text. 	<p>Learning Objectives:</p> <ol style="list-style-type: none"> a. List the five strategies that are part of a network management plan for avoiding problems. b. Describe how establishing a baselin aids in preventing problems. c. Describe how documentation aids in troubleshooting. d. Incorporate a preemptive troubleshooting approach into a network plan. e. List the five steps that comprise a structured troubleshooting approach. f. Describe how a terminator is used in troubleshooting. g. Identify the capabilities of a protocol analyzer. h. Identify sources of up-to-date networking and troubleshooting information. i. Install Microsoft Technical Information Network (TechNet). j. Access the Microsoft Download Library (MSDL). k. Determine how to approach a given network problem in order to isolate and identify the cause. l. Identify any special equipment which would make it easier to solve a given network problem. m. Identify Internet services. n. Access the Microsoft Network (MSN). o. Access the Microsoft FTP site.

Types of Instruction

Classroom Presentation

Grading Policy

Evaluation Methods: Assignments = 50%
Tests = 40%
Posttest = 10%

Grading Scale:

Grade	Requirement
A	90%-100%
B	80%-89%
C	70%-79%
D	60%-69%
F	Below 60%

Learning Plans

Learning Plan 1-- Learning Plan 1

Overview:

In this Learning Plan, You will be introduced to the essential components common to every network and see how these components work together to deliver the benefits that have made networks an essential business tool. You will also learn about the two primary types of networks, peer-to-peer and server based, and the three basic ways to lay out a network.

Competency:

1. **Identify the elements common to every network.**

Learning Activities:

- _____ 1. COMPLETE Pretest activity.
- _____ 2. READ Chapter 1, pp. 1-70.
- _____ 3. PARTICIPATE in class discussion on Network Orientation.
- _____ 4. COMPLETE Q & A's (pp. 7,11, 19, 27, 40, 47, and 51)
- _____ 5. COMPLETE Chapter Checkup (pp. 54-55).
- _____ 6. PARTICIPATE in class discussion on the Case Study(pp. 57-58), Troubleshooter(pp. 59-61), and the LAN Planner(pp. 64-70)
- _____ 7. WRITE possible solutions to items in Learning Activity 6 (above).
- _____ 8. COMPLETE Lab 2 (Sharing Directories) pp.30-32.

Performance

Assessment Activities:

- _____ 1. Check answers to Q & A's
- _____ 2. Check answers to Chapter Checkup.
- _____ 3. Submit answers to Case Study, Troubleshooter, and LAN Planner for evaluation.
- _____ 4. Verify results of Lab 2.

Learning Plan 2-- Learning Plan 2

Overview:

In this Learning Plan, you will be introduced to physical media, which connect computers. You will learn about the major cable types including their construction, features, and operation. You will also learn the differentiation between the various wireless transmission and receiving components. Also, basic features and functions of adapter cards, different cable media connector type, as well as configuration options for the network adapter cards.

Competency:

2. **Explain how servers, clients, and peripherals are physically connected.**

Learning Activities:

- _____ 1. READ Chapter 2, pp. 71-162.
- _____ 2. PARTICIPATE in class discussion of How a Network Functions.
- _____ 3. COMPLETE Q & A's (pp. 84, 91, 94, 97, 113, 116, 123,129, and 135).
- _____ 4. COMPLETE Chapter Checkup (pp. 144-147).
- _____ 5. PARTICIPATE in class discussion on the Case Study(148-150), Troubleshooter(151-156), and the LAN Planner(157-162).
- _____ 6. WRITE possible solutions for the above Learning Activity 5.

Performance**Assessment Activities:**

- _____ 1. Check answers to Q & A's.
- _____ 2. Check answers to Chapter Checkup.
- _____ 3. Submit answers to Case Study, Troubleshooter, and LAN planner.
- _____ 4. Complete Test#1 on Chapters 1 & 2.

Learning Plan 3-- Learning Plan 3**Overview:**

In this Learning plan you will learn about the essential model upon which network communication is based, how software utilities enable hardware function. You will also learn how a network breaks data down into manageable chunks before transmitting it and the special languages computers use in communicating with each other. Finally you will discover the different ways computers can put data on the cable during transmission.

Competency:

3. **Determine how networks are implemented following standards.**

Learning Activities:

- _____ 1. READ Chapter 3, pp. 163-247
- _____ 2. PARTICIPATE in class discussion on How a Network Functions.
- _____ 3. COMPLETE Q & A's (pp. 174, 178, 186, 198, 207, 215, 220, 227, and 231).
- _____ 4. COMPLETE Chapter Checkup (pp. 233-236).
- _____ 5. PARTICIPATE in class discussions on the Case Study (pp.237-239), Troubleshooting (pp.240-242), and the LAN Planner (pp.244-247).
- _____ 6. WRITE possible solutions for items in above Learning Activity 5.
- _____ 7. COMPLETE Lab 8 (Installing Network Adapter Cards) pp.187-190.

**Performance
Assessment Activities:**

- _____ 1. Check answers to Q & A's.
- _____ 2. Check answers to Chapter Checkup.
- _____ 3. Submit answers to Case Study, Troubleshooter, and LAN Planner.
- _____ 4. Verify results of Lab 8

Learning Plan 4-- Learning Plan 4

Overview:

In this Learning Plan, you will learn the functional descriptions for the four major network architectures. For each of the network architectures, you will discover the primary design features, the performance parameters, the hardware and software considerations, and designs for implementation.

Competency:

4. Describe the four major network architectures.

Learning Activities:

- _____ 1. READ Chapter 4, pp.249-311
- _____ 2. PARTICIPATE in class discussion on Network Architectures.
- _____ 3. COMPLETE Q & A's (pp.255, 264, 269, 276, 279, 295, 292, and 196).
- _____ 4. COMPLETE Chapter Checkup (pp.300-301)
- _____ 5. PARTICIPATE in class discussion on the Case Study(pp.302-303), Troubleshooter(pp.304-305), and the LAN Planner(pp.306-311).
- _____ 6. WRITE possible solutions for items in above Learning

Activity 5.

Performance**Assessment Activities:**

- _____ 1. Check answers to Q & A's
- _____ 2. Check answers to Chapter Checkup.
- _____ 3. Submit answers to Case Study, Troubleshooter, and LAN Planner.
- _____ 4. Complete Test#2 which covers chapters 3 & 4.

Learning Plan 5-- Learning Plan 5**Overview:**

In this Learning Plan, you will learn how Network Operations encompasses several different aspects of networking including the kinds of applications and services networks provide to users, as well as the administrators role in installing and managing applications and services.

Competency:

5. **Summarize the major aspects of network operations.**

Learning Activities:

- _____ 1. READ Chapter 5, pp. 313-427
- _____ 2. PARTICIPATE in class discussion on Network Operations.
- _____ 3. COMPLETE Q & A's(pp.322, 333, 337, 350, 354, 369, 381, 393, and 403).
- _____ 4. COMPLETE Chapter Checkup (pp.409-411).
- _____ 5. PARTICIPATE in class discussion on the Case Study (pp.412-415), Troubleshooter (417-422), and the LAN Planner (pp.423-427).
- _____ 6. WRITE possible solutions for items in above Learning Activity 5.
- _____ 7. COMPLETE Lab 15 (Installing a Network Operating System). pp.338-344.

Performance**Assessment Activities:**

- _____ 1. Check answers to Q & A's
- _____ 2. Check answers to Chapter Checkup.
- _____ 3. Submit answers to Case Study, Troubleshooter, and LAN Planner.
- _____ 4. Verify results of Lab 15.

Learning Plan 6-- Learning Plan 6

Overview:

In this Learning Plan, you will learn how to keep and network going after it has been started. You will discover how to provide users with access to the network and how to maintain a user's appropriate network status. You will also learn how to monitor a networks performance, discover some of the common methods for ensuring network data security, and protect data.

Competency:**6. Distinguish the essential areas of network administration.****Learning Activities:**

- _____ 1. READ Chapter 6 (pp.429-529)
- _____ 2. PARTICIPATE in class discussions on Network Administration and Support.
- _____ 3. COMPLETE Q & A's (pp. 440, 450, 463, 480, 484, 492, and 502).
- _____ 4. COMPLETE Chapter Checkup (pp.505-507).
- _____ 5. PARTICIPATE in class discussion on the Case Study (pp.508-514), Troubleshooter (pp. 517-521), and the LAN Planner (pp.522-528).
- _____ 6. WRITE possible solutions for items in above Learning Activity 5.
- _____ 7. COMPLETE Lab 20A (Creating and Deleting User Accounts) pp. 451-454.

Performance**Assessment Activities:**

- _____ 1. Check answers to Q & A's
- _____ 2. Check answers to Chapter Checkup.
- _____ 3. Submit answers to Case study, Troubleshooter, and LAN Planner.
- _____ 4. Verify results of Lab 20A
- _____ 5. Complete Test#3 on Chapters 5 & 6.

Learning Plan 7-- Learning Plan 7**Overview:**

In this Learning Plan, you will learn about the devices and technologies that enable you to expand a network across the street or around the world. You will learn about the basic communication building blocks - the modem and see how modems operate, what different types of modems can do, and what different modem standards mean. You will also learn how to expand a LAN/WAN using bridges, routers, brouters, gateways, and more. You will discover the newest WAN transmission methods including ATM.

Competency:**7. Explain the devices and technologies that expand a network.**

Learning Activities:

- _____ 1. READ Chapter 7, pp.531-633).
- _____ 2. PARTICIPATE in class discussion on Larger Networks.
- _____ 3. COMPLETE Q & A's (pp.539, 544, 548, 555, 563, 573, 578, 585, 589, 592, 598, 603, and 610).
- _____ 4. COMPLETE Chapter Checkup (pp. 615-618).
- _____ 5. PARTICIPATE in class discussion on the Case Study (pp. 619-620), Troubleshooter (pp.622-625), and the LAN Planner (pp.625-633).
- _____ 6. WRITE possible solutions for items in above Learning Activity 5.

Performance Assessment Activities:

- _____ 1. Check answers to Q & A's.
- _____ 2. Check answers to Chapter Checkup.
- _____ 3. Submit answers to Case Study, Troubleshooter, and LAN Planner.

Learning Plan 8-- Learning Plan 8**Overview:**

In this Learning Plan, you will learn about maintaining a network once it is installed. You will learn how to avoid problems through planning and management and how to monitor network behavior to develop a baseline of activity. You will also learn several troubleshooting tools and resources for troubleshooting help including network support products and online services.

Competency:**8. Troubleshoot and prevent common network problems.****Learning Activities:**

- _____ 1. READ Chapter 8, pp.635-705.
- _____ 2. PARTICIPATE in class discussion on Solving Network Problems.
- _____ 3. COMPLETE Q & A's (643, 649, 656, 662, and 670).
- _____ 4. COMPLETE Chapter Checkup (pp.687-689).
- _____ 5. PARTICIPATE in class discussion on the Case Study (pp. 691-692), Troubleshooter (pp.693-699), and the LAN Planner (pp.700-705).
- _____ 6. WRITE possible solutions for items in above Learning Activity 5.

Performance Assessment Activities:

- _____ 1. Check answers to Q & A's
- _____ 2. Check answers to Chapter Checkup.

- _____3. Submit answers to Case Study, Troubleshooter, and LAN Planner.
- _____4. Complete Test#4 which covers Chapters 7 & 8.
- _____5. Complete Posttest activity.