

Networking Fundamentals



Courseware 8366-1

Exam 98-366

Technology Associate

Course Description

Networking Fundamentals provides students with fundamental network administration concepts. Students who complete this course will have reviewed all the exam objectives and be on their way to preparing for Microsoft Technology Associate Exam #98-366. It can also serve as a stepping stone to the Microsoft Certified Technology Specialist exams.

Suggested Timings					
20-Hours		12-Week		16-Week	
Instruction	Lab	Instruction	Lab	Instruction	Lab
15	5	27	5	35	5
20		32		40	

Course Series

This *Networking Fundamentals* courseware is one of seven courses in the Microsoft Technology Associate Series. Other courses available in the series include:

- Software Development Fundamentals
- Windows Development Fundamentals
- Web Development Fundamentals
- Database Administration Fundamentals
- Security Fundamentals
- Windows Server Administration Fundamentals

The Microsoft Technology Associate Series contains exercises that students can use to learn each of the features discussed. Additional resources to practice and apply the skill sets are available from the CCI Technology Associate Microsite. Students are encouraged to register at <http://mta.ccilearning.com> in order access these additional activities both during and after completing the course.

Instructor Resources are available and are produced specifically to help and assist an instructor in preparing to deliver the course using the CCI materials. Contact your coordinator or administrator, or call your CCI Account Manager for information on how to access these resources.

Course Prerequisites

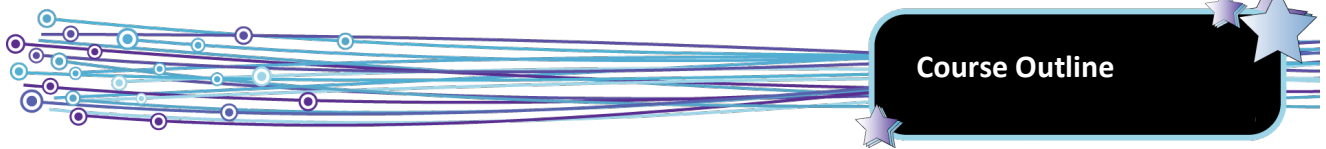
Prior to taking this course, students must possess the following basic computer literacy and Windows skills.

- Start and run Windows
- Use Minimize, Restore Down/Maximize, or Close
- Use the left and right mouse buttons appropriately
- Understand file management techniques
- Navigate between files, folders, or drives

Course Objectives

After completing this course, you will be able to:

- ✦ Define the function of networks.
- ✦ Differentiate between server-based and peer-to-peer networks.
- ✦ Identify the function and characteristics of local area networks (LANs).
- ✦ Understand addresses used on a network, including MAC addresses and IP addresses.
- ✦ Identify reserved IP addresses.
- ✦ Identify the function and characteristics of wide area networks (WANs).
- ✦ Describe various WAN technologies, including dial-up, ISDN, leased lines, DSL and cable.
- ✦ Describe the history and structure of the Internet.
- ✦ Differentiate between the Internet, an intranet and an extranet.
- ✦ Describe the functions of VPN, firewalls and security zones.
- ✦ Understand wireless networking technologies, and WLAN standards and security methods.
- ✦ Compare network topologies and media access methods.
- ✦ Identify the seven layers of the Open Systems Interconnection (OSI) reference model.
- ✦ Explain the process of data encapsulation and packet creation.
- ✦ Identify the four layers of the TCP model, and describe how they correspond to layers of the OSI model.
- ✦ Review concepts and terms related to network traffic.
- ✦ Understand the function and characteristics of network switches.
- ✦ Understand the function and benefits of virtual LANs (VLANs).
- ✦ Understand the function and characteristics of routers.
- ✦ Describe the routing function.
- ✦ Understand network address translation (NAT).
- ✦ Identify various transmission types, such as synchronous, asynchronous, baseband and broadband.
- ✦ Identify the characteristics of different types of transmission media such as twisted-pair, coaxial, and fiber-optic cable, including transmission speeds and susceptibility to interference and interception.
- ✦ Understand twisted-pair Ethernet wiring.
- ✦ Describe technologies for free-space transmission.
- ✦ Identify proper cabling procedures.
- ✦ Identify at which layer of the OSI and TCP models various protocols and applications operate.
- ✦ Describe the structure of IP packets and Ethernet frames, including the structure of the IP and Ethernet headers.
- ✦ Differentiate between connection-oriented and connectionless protocols.
- ✦ Describe the function and characteristics of TCP, including the structure of the TCP header and the steps of the TCP handshake.
- ✦ Describe the function and characteristics of UDP, including the structure of the UDP header.
- ✦ Explain the significance of port numbers, describe port number ranges, and list the well-known port numbers for the most common Internet protocols.
- ✦ Describe the functions of Internet addressing and address types.
- ✦ Describe the characteristics of IPv4 addresses, including bit counts, address classes, default subnet masks, the use of the Boolean AND function, classful subnetting, and classless addressing (CIDR).
- ✦ Differentiate between static and dynamic IP addressing.
- ✦ Identify reserved address ranges in IPv4.
- ✦ Identify the limitations of IPv4.
- ✦ Describe the characteristics of IPv6 addresses, including the hexadecimal numbering system, address abbreviation techniques, and address types.
- ✦ Identify reserved address ranges in IPv6.
- ✦ Describe IPv6 subnet masks, compare IPv4 and IPv6 headers, and identify the advantages of using IPv6.
- ✦ Differentiate between NetBIOS and host names.
- ✦ Describe the structure and function of the Domain Name System including domains, the domain name space, DNS server types, and DNS records.
- ✦ Describe the function of Windows Internet Name Service (WINS).
- ✦ Identify the steps in the name resolution process.
- ✦ Describe the function of Dynamic Host Configuration Protocol (DHCP).
- ✦ Describe remote access tools.
- ✦ Describe the function of IP Security (IPsec).
- ✦ Describe the characteristics and use of TCP diagnostic tools, including ping, tracert, pathping, telnet, ipconfig and netstat.



Course Outline

About This Courseware

Courseware Description
Course Design
Course Objectives
Conventions and Graphics

Lesson 1: Introduction to Networking

Lesson Objectives
What Is a Network?
Local Area Networks (LANs)
Wide Area Networks (WANs)
A Brief Overview of the Internet
Internet, Intranet and Extranet
Wireless Technologies
Network Topologies
Lesson Summary
Review Questions

Lesson 2: Understanding Network Hardware

Lesson Objectives
Networking Models
Traffic-related Concepts
Networking Devices
Switches
Virtual LANs (VLANs)
Routers
Transmission Types
Transmission Media
Signal Interception
Transmission Media and Ethernet Standards
Proper Cabling Procedures
Lesson Summary
Review Questions

Lesson 3: Understanding Protocols and Services

Lesson Objectives
Networking Models Revisited
Structure of Packets and Frames
Connection-Oriented vs.
 Connectionless Protocols
Port Numbers
Internet Addressing
Internet Protocol Version 4 (IPv4)
 Addresses
Internet Address Classes
Internet Protocol Version 6 (IPv6)
Names Resolution
Networking Services
Remote Access
TCP Tools
Lesson Summary
Review Questions

Appendices

Appendix A: Courseware Mapping
Appendix B: Glossary of Terms
Appendix C: Index