

Wallenpaupack Area School District

COURSE: Networking Essentials

GRADE LEVEL: 11-12

LENGTH OF COURSE: 1 semester

TEXT: Network+ Guide to Networks

PUBLISHER: Course Technology

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COURSE DESCRIPTION:

This course covers an introduction to the basics of computer networking. Students will install, configure, customize, administer and troubleshoot peer-to-peer and server based networks. This course also covers network components, LANs, WANs, network communication media, standards, protocols, architecture and network support tools. This course follows Microsoft certification curriculum to help students prepare for certification exam. A student may opt to take the certification exam off-site and at the student's expense.

CURRICULUM WRITING TEAM:

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DATE OF REVISION:

June 2005

Wallenpaupack Area School District

Course: Networking Essentials

Grade Level: 11 & 12

Unit: Overview of Course,
Introduction to curriculum,
Introduction to Networking

PA Standards: 3.7.10.A
3.7.10.C
3.7.10.E

Topics: Lab Safety Class Conduct in a Lab Environment Definition of Network Simple Network Topology Basic Software Packages Network Architecture Common Elements to all Networks Fundamental application and management of Networks Certifications available to networking professionals	Skills: Identify the characteristics of networked computers relative to standalone systems Identify the elements of a network Describe several specific uses for a network Identify certifications available to networking professionals
Activities: Class Discussion Multimedia Curricula Handouts	Performance Assessments: Question and Answer Dialog Written Examination

Wallenpaupack Area School District

Course: Networking Essentials

Grade Level: 11-12

Unit: Networking Standards and the OSI Model

PA Standards: 3.7.10.E
3.7.12.E
3.7.10.E

Topics:	Skills:
Network Standards Organizations The OSI Model Applying the OSI Model Standards Organizations Network Specifications	Identify the organizations that set standards for networking Explain the Layers of the OSI Model Describe specific networking services within each layer of the OSI Model Explain how two systems communicate through the OSI Model Discuss the structure and purpose of Data Frames
Activities:	Performance Assessments:
Teacher Lead Demonstration Class discussion Interactive Multimedia Curricula	Class Session Questioning Instructor Designed Examination

Wallenpaupack Area School District

Course: Networking Essentials

Grade Level: 11 & 12

Unit: Networking Protocols

PA Standards: 3.7.10.A
3.7.10.C
3.7.12.B

Topics:	Skills:
Introduction to Network Protocols The TCP/IP Suite of protocols The IPX/SPX Protocol The NetBIOS and NetBEUI Protocols The AppleTalk Protocol Installing Protocols	Identify the characteristics of various Network Protocols Understand the position of network protocols in the OSI Model Identify the core protocols of several protocol suites and their function Understand various protocol's addressing schemes Install network protocols on Windows Based workstations
Activities:	Performance Assessments:
Instructor Led Demonstration Class Discussion Hands On Lab Exercises	Written Examination Lab Exercise Reports

Wallenpaupack Area School District

Course: Networking Essentials

Grade Level: 11 & 12

Unit: Networking Media

PA Standards: 3.7.10.A
3.7.10.B
3.7.10.C
3.7.12.A

Topics:	Skills:
Data Transmission Media Characteristics Network Cabling Atmospheric Transmission Media Selection of Transmission Media Application of Transmission Media	Explain concepts related to data transmission and noise Describe the physical characteristics of various network transfer media Explain operating characteristics of different networking media Identify various methods of transmitting data
Activities:	Performance Assessments:
Teacher Led Demonstration Exhibition of Products and Application Practice Lab Exercise	Class Discussion Written Examination Lab Exercise Report

Wallenpaupack Area School District

Course: Networking Essentials

Grade Level: 11 & 12

Unit: Network Architecture

PA Standards: 3.7.10.A
3.7.10.E
3.7.12.A

Topics: Simple LAN Topologies Hybrid LAN Topologies Enterprise-Wide Topologies WAN Topologies Network Transport Systems Design Considerations for various Networks	Skills: Describe basic and hybrid LAN technologies Explain operating characteristics of various topologies Describe a variety of Network topologies Explain the structure and function of the Ethernet Transport System Explain the structure and function of the Token Ring Transport System
Activities: Teacher Led Demonstration Exhibition of Products and Application Practice Lab Exercise	Performance Assessments: Class Discussion Written Examination Lab Exercise Report

Wallenpaupack Area School District

Course: Networking Essentials

Grade Level: 11 & 12

Unit: Networking Hardware

PA Standards: 3.7.10.E

3.7.12.E

Topics:	Skills:
Network Interface Cards Repeaters Hubs Bridges Routers Gateways	Identify the functions of LAN connectivity hardware Install and configure a network interface card Identify problems with connectivity hardware Describe the factors involved in choosing various network connectivity hardware Describe the function of routing protocols
Activities:	Performance Assessments:
Teacher Led Demonstration Lab Exercises	Written Examination Student Lab Exercise and Report

Wallenpaupack Area School District

Course: Networking Essentials

Grade Level: 11 & 12

Unit: WANs and Remote Connectivity

PA Standards: 3.7.10.E
3.7.12.A

Topics: WAN Essentials WAN Transmission Methods WAN Implementation Establishing Remote Connectivity	Skills: Understand the differences between LANs and WANs Identify network applications that require WAN technology Describe the various WAN transmission methods Identify criteria for selecting an appropriate WAN topology, transmission method, and operating system Install and configure simple remote connectivity in a remote workstation
Activities: Teacher Led Demonstration Exhibition of Products and Application Practice Lab Exercise	Performance Assessments: Class Discussion Written Examination Lab Exercise Report

Wallenpaupack Area School District

Course: Networking Essentials

Grade Level: 11 & 12

Unit: Network Operating Systems
and Windows NT-Based
Networking

PA Standards: 3.7.10.C
3.7.10.D
3.7.10.E
3.7.12.C
3.7.12.D
3.7.12.E

<p>Topics:</p> <ul style="list-style-type: none"> Introduction to Network Operating Systems Introduction to Windows NT Server Windows NT Server Hardware The Windows NT Operating system Installing and Configuring a Windows NT Server Internetworking with other Network Operating Systems 	<p>Skills:</p> <ul style="list-style-type: none"> Define requirements and characteristics of a Windows NT network environment Describe the functions of an NT-Based Server in an enterprise-wide network Perform a Windows NT Server Installation Manage users, groups, and rights under Windows NT Server Understand how Windows NT integrates with other network operating systems Discuss elements of a network operating system
<p>Activities:</p> <ul style="list-style-type: none"> Handout Supplement Interactive Media Teacher Led Demonstration Lab Exercise and Application 	<p>Performance Assessments:</p> <ul style="list-style-type: none"> Examination Class Discussion Lab Exercise Report

Wallenpaupack Area School District

Course: Networking Essentials

Grade Level: 11 & 12

Unit: Netware-Based Networking

PA Standards: 3.7.10.C

3.7.10.D

3.7.12.C

3.7.12.D

Topics:	Skills:
Introduction to Netware Advantages of the Netware networking software Netware Server Hardware Netware Operating System specifics Installing and configuring a Netware Server Internetworking with other operating systems	Identify the advantages of using the Netware network operating system Describe Netware's server hardware requirements Describe Netware's memory, direct structure, and file system architectures Plan for and perform a simple Netware server installation Explain how Netware integrates with other network operating systems
Activities:	Performance Assessments:
Handout Supplement Interactive Media Teacher Led Demonstration Lab Exercise and Application	Examination Class Discussion Lab Exercise Report

Wallenpaupack Area School District

Course: Networking Essentials

Grade Level: 11 & 12

Unit: Networking with UNIX

PA Standards: 3.7.10.C

3.7.10.D

3.7.12.C

3.7.12.D

Topics:	Skills:
A Brief history of UNIX The Current state of UNIX on the market Why choose UNIX? UNIX Server Hardware Linux Specifics Basic Linux Commands Installing and Configuring a Linux Server Internetworking with other Network Operating Systems	Describe the origins and history of the UNIX operating system Identify similarities and differences between popular implementations of UNIX Understand why you might choose a UNIX server for a corporate network Explain and execute basic UNIX commands Install Linux on an Intel-Based PC Explain how UNIX can be internetworked with other network operating systems
Activities:	Performance Assessments:
Handout Supplement Interactive Media Teacher Led Demonstration Lab Exercise and Application	Examination Class Discussion Lab Exercise Report

Wallenpaupack Area School District

Course: Networking Essentials

Grade Level: 11 & 12

Unit: Networking with TCP/IP and the Internet

PA Standards: 3.7.10.C
3.7.10.D
3.7.12.D

Topics:	Skills:
Addressing and Name Resolution TCP/IP Sub-Protocols TCP/IP Troubleshooting Internet Services	Discuss additional details of TCP/IP addressing and subprotocols Understand the purposes and uses of BOOTP, DHCP, WINS, DNS, and host files Use TCP/IP protocols for network troubleshooting Understand and use TCP/IP applications, such as Internet browsers, email, and e-commerce
Activities:	Performance Assessments:
Handout Supplement Interactive Media Teacher Led Demonstration Lab Exercise and Application	Examination Class Discussion Lab Exercise Report

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Course: Networking Essentials

Grade Level: 11 & 12

Unit: Troubleshooting Network Problems

PA Standards: 3.7.10.A
3.7.10.B
3.7.10.C
3.7.10.D
3.7.12.A
3.7.12.D
3.7.12.E

Topics: Troubleshooting Methodology Practical Troubleshooting Troubleshooting Tools	Skills: Describe the elements of an effective troubleshooting methodology Discuss practical issues related to troubleshooting Use software and hardware tools to diagnose problems
Activities: Handout Supplement Interactive Media Teacher Led Demonstration Lab Exercise and Application	Performance Assessments: Examination Class Discussion Lab Exercise Report

Wallenpaupack Area School District

Course: Networking Essentials

Grade Level: 11 & 12

Unit: Maintaining and Upgrading a Network

PA Standards: 3.7.10.A
 3.7.10.B
 3.7.10.C
 3.7.10.E
 3.7.12.A
 3.7.12.E

<p>Topics:</p> <ul style="list-style-type: none"> Maintaining adequate records and keeping track of a network Software Changes Hardware and Physical Plant Changes Managing Growth and Change 	<p>Skills:</p> <ul style="list-style-type: none"> Perform a baseline analysis to determine the state of a network Plan and follow regular hardware and software maintenance routines Describe the steps involved in upgrading network operating system software Describe the steps involved in adding or upgrading network hardware Address the potential pitfalls of making changes to the network Research networking trends to plan future network upgrades
<p>Activities:</p> <ul style="list-style-type: none"> Handout Supplement Interactive Media Teacher Led Demonstration Lab Exercise and Application 	<p>Performance Assessments:</p> <ul style="list-style-type: none"> Examination Class Discussion Lab Exercise Report

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Course: Networking Essentials

Grade Level: 11 & 12

Unit: Ensuring Integrity and Availability

PA Standards: 3.7.10.E
3.7.12.A
3.7.12.E

Topics:	Skills:
What are Integrity and Availability? Network Viruses Fault Tolerance Data Backup Disaster Recovery	Identify the characteristics of a network that keep data safe from loss or damage Protect an enterprise-wide network from viruses Explain network and system level fault tolerance techniques Discuss issues related to network backup and recovery strategies Describe the components of a useful disaster recovery plan
Activities:	Performance Assessments:
Handout Supplement Interactive Media Teacher Led Demonstration Lab Exercise and Application	Examination Class Discussion Lab Exercise Report

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Course: Networking Essentials

Grade Level: 11 & 12

Unit: Network Security

PA Standards: 3.7.10.D
3.7.10.E
3.7.12.D
3.7.12.E

Topics:	Skills:
<ul style="list-style-type: none"> Terminology Security Audits Security Risks Addressing Risks associated with people Addressing Risks associated with Hardware and Design Addressing Risks associated with Software Virtual Private Networks 	<ul style="list-style-type: none"> Identify security risks in LANs and WANs Explain how physical security contributes to network security Discuss hardware and design-based security techniques Use network operating system techniques to provide basic security Implement enhanced security through specialized software Describe the elements of an effective security policy
Activities:	Performance Assessments:
<ul style="list-style-type: none"> Handout Supplement Interactive Media Teacher Led Demonstration Lab Exercise and Application 	<ul style="list-style-type: none"> Examination Class Discussion Lab Exercise Report

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Course: Networking Essentials

Grade Level: 11 & 12

Unit: Managing Network Design and Implementation

PA Standards: 3.7.10.A
3.7.10.B
3.7.10.D
3.7.12.A
3.7.12.C

Topics:	Skills:
Introduction to Project Management Managing Network Implementation	Describe the elements and benefits of project management Analyze the current status of a network Perform a needs assessment and recommend changes based on findings Manage a network implementation project Design a test pilot network
Activities:	Performance Assessments:
Handout Supplement Interactive Media Teacher Led Demonstration Lab Exercise and Application	Examination Class Discussion Lab Exercise Report