

# Cybersecurity Software Operations

6304 36 weeks

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## Course Description

**Suggested Grade Level:** 11 or 12

**Prerequisite:** 6302

Cybersecurity Software Operations is designed to teach many aspects of computer support and network administration. Students learn networking concepts, from usage to components, and create peer-to-peer network systems and client server networks. Students learn how to install and configure network cards and connect them to networks; to install the operating systems; to create, set up, and manage accounts; to load software; and to establish, implement, and maintain network integrity security plans. This course may cover software-based network operating systems, such as Windows Server or Linux, to prepare students with a foundation in computer network administration.

Recommended prerequisite(s): Keyboarding course(s) or teacher-approved demonstration and documentation of touch keyboarding skills and Information Technology Fundamentals (6670).

## Task Essentials Table

- Tasks/competencies designated by plus icons (⊕) in the left-hand column(s) are essential
- Tasks/competencies designated by empty-circle icons (○) are optional
- Tasks/competencies designated by minus icons (⊖) are omitted
- Tasks marked with an asterisk (\*) are sensitive.

Task Number	6304	Tasks/Competencies
Using Desktop Systems Concepts		
39	⊕	Navigate an end user's digital operating system network/environment.
40	⊕	Compare current digital operating systems.
41	⊕	Navigate the digital operating system environment.
42	⊕	Demonstrate the procedures followed when installing digital operating systems.
43	⊕	Manage a file system structure.
44	⊕	Compare server operating systems.
45	⊕	Explain different types of drive partitions and file system formats.
46	⊕	Explain file system formats.
47	⊕	Analyze current and emerging specialized server hardware.

48	<input checked="" type="radio"/>	Manage partitions and volumes.	
49	<input checked="" type="radio"/>	Explain the authentication of users in a network environment.	
50	<input checked="" type="radio"/>	Install applications.	
Introducing Network Design Essentials			
51	<input checked="" type="radio"/>	Define aspects of networks.	
52	<input type="radio"/>	Define types of network architecture.	
53	<input type="radio"/>	Differentiate between distributed and centralized computing.	
54	<input type="radio"/>	Identify services delivered by a server.	
55	<input type="radio"/>	Describe standard network LAN topologies.	
56	<input checked="" type="radio"/>	Describe variations of standard topologies.	
57	<input checked="" type="radio"/>	Describe the role of the network adapter.	
58	<input type="radio"/>	Describe the functions of networking infrastructure (e.g., adapter, router, switch, bridge, wireless access point).	
59	<input type="radio"/>	Describe the primary features of each major access method.	
Exploring Networking Media			
60	<input checked="" type="radio"/>	Define terms related to wired and wireless network media.	
61	<input checked="" type="radio"/>	Identify the types and uses of wired network media.	
62	<input checked="" type="radio"/>	Identify the types and uses of wireless network media.	
63	<input type="radio"/>	Describe the concept of broadband.	
64	<input type="radio"/>	Describe the types of modems.	
Understanding Networking Standards and Models			
65	<input checked="" type="radio"/>	Describe each layer of the Open Systems Interconnection (OSI) model.	
66	<input checked="" type="radio"/>	Describe devices in a network environment and their place in the OSI model.	
67	<input checked="" type="radio"/>	Define the basic components of a network packet.	

68	<input checked="" type="radio"/>	Describe networking protocols.
69	<input type="radio"/>	Map network processes.
70	<input checked="" type="radio"/>	Identify the workings of a WAN.
Conducting TCP/IP Activities		
71	<input checked="" type="radio"/>	Describe TCP/IP.
72	<input type="radio"/>	Compare static and dynamic IP routing.
73	<input checked="" type="radio"/>	Configure TCP/IP.
74	<input checked="" type="radio"/>	Test a TCP/IP configuration, using operating-system-specific commands.
75	<input checked="" type="radio"/>	Identify the network and host identifications' TCP/IP addresses.
76	<input type="radio"/>	Compare IPv4 and IPv6.
77	<input checked="" type="radio"/>	Explain the function of a subnet mask and classless inter-domain routing (CIDR) format.
78	<input checked="" type="radio"/>	Describe a loopback address.
79	<input checked="" type="radio"/>	Describe the services provided by Network Basic Input/Output System (NetBIOS) over TCP/IP.
80	<input type="radio"/>	Explain the process of host name resolution.
81	<input type="radio"/>	Modify the host's file to resolve host names.
82	<input type="radio"/>	Configure File Transfer Protocol (FTP).
83	<input type="radio"/>	Explain the purpose of the Simple Network Management Protocol (SNMP).
84	<input type="radio"/>	Describe the implementation of a virtual LAN (VLAN).
Ensuring Network Security		
85	<input type="radio"/>	Monitor network traffic.
86	<input type="radio"/>	Analyze network systems for security vulnerabilities.
87	<input checked="" type="radio"/>	Explain the core security principles used in network management.

88	<input checked="" type="radio"/>	Analyze threats and risks to networks and local account policies.	
89	<input checked="" type="radio"/>	Analyze internal and external threats to computer networks.	
90	<input checked="" type="radio"/>	Identify strategies to mitigate risk.	
91	<input checked="" type="radio"/>	Identify sustainable computer networking practices.	
92	<input checked="" type="radio"/>	Install a virtualized operating system.	
93	<input checked="" type="radio"/>	Describe the different types of network adapter modes for virtual operating systems.	
94	<input checked="" type="radio"/>	Incorporate security scanning tools such as Intrusion Detection System (IDS) and Intrusion Prevention System (IPS) and/or security appliances.	
95	<input checked="" type="radio"/>	Identify threats and vulnerabilities from users.	
96	<input checked="" type="radio"/>	Identify security measures to physical threats to network systems.	
97	<input checked="" type="radio"/>	Identifying other risks and threats to systems.	
Providing Basic User Training and Support			
98	<input type="radio"/>	Identify training needs.	
99	<input type="radio"/>	Provide an orientation to a network system (system onboarding).	
100	<input type="radio"/>	Develop a training plan.	
101	<input type="radio"/>	Provide training to users.	
102	<input type="radio"/>	Create a user manual.	
103	<input type="radio"/>	Provide ongoing basic user support.	
Performing Legal and Ethical Functions			
104	<input type="radio"/>	Identify copyright and licensing laws that apply to computer use and network administration.	
105	<input type="radio"/>	Describe procedures to ensure the proper licensing of a client-server operating system and applications.	
106	<input type="radio"/>	Identify ethical behavior that is expected of users and administrators.	

107	<input type="radio"/>	Describe procedures for documentation found in network policies.
108	<input type="radio"/>	Explain network hardening.
109	<input type="radio"/>	Manage a network.
110	<input checked="" type="radio"/>	Optimize a network.
Preparing for Industry Certification		
111	<input checked="" type="radio"/>	Describe the process and requirements for obtaining industry certifications.
112	<input checked="" type="radio"/>	Identify testing skills/strategies for a certification examination.
113	<input checked="" type="radio"/>	Demonstrate ability to complete selected practice examinations (e.g., practice questions similar to those on certification exams).
114	<input checked="" type="radio"/>	Complete an industry certification examination representative of skills learned in this course.
Developing Employability Skills		
115	<input checked="" type="radio"/>	Research careers in networking and systems security.
116	<input checked="" type="radio"/>	Compose a résumé for electronic processing.
117	<input checked="" type="radio"/>	Assemble a professional portfolio that contains representative samples of student work.
118	<input type="radio"/>	Create a cover letter to accompany a résumé.
119	<input type="radio"/>	Complete manual and electronic application forms.
120	<input type="radio"/>	Participate in an internship program.
121	<input checked="" type="radio"/>	Research a company in preparation for a job interview.
122	<input type="radio"/>	Participate in a mock interview.
123	<input type="radio"/>	Compose an interview follow-up letter.
124	<input type="radio"/>	Identify the steps to follow when resigning from a position.
125	<input checked="" type="radio"/>	Identify potential employment barriers for nontraditional groups and ways to overcome these barriers.

Legend:  Essential  Non-essential  Omitted

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# Curriculum Framework

## Using Desktop Systems Concepts

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### Task Number 39

#### Navigate an end user’s digital operating system network/environment.

##### Definition

Navigation should include using digital operating system tools, such as system utilities (e.g., disk cleanup, disk defragmenter, system restore).

##### FBLA Competitive Events and Activities Areas

Computer Applications

Computer Problem Solving

Network Design

Networking Concepts

Word Processing

##### Microsoft Imagine Academy Resources

[3.019] Configuring Disks and Device Drivers—E-Learning Module 1

[Configuring Disk Partitions on Client Computers Running Windows 7 Operating Systems](#)

[4.070] Windows 7: Using Disks and Devices—Lesson 4

[Windows 7 Lesson Plan: Using Disks and Devices](#)

[5.181] Windows 7 Higher Education: Lesson 4—Project 1

[Disk Management Snap-In \(project\)](#)

##### NBEA Achievement Standards for Information Technology



**Compare and contrast the functions, features, and limitations of different operating systems and utilities (e.g., open source, mobile, and proprietary operating systems).**

**Describe various types of operating systems and utilities.**

**Navigate the basic operating system.**

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## **Task Number 40**

**Compare current digital operating systems.**

### **Definition**

Comparison should include

- defining the term *operating system*
- describing the functions and characteristics unique to specific digital operating systems (e.g., Disk Operating System [DOS], Microsoft Graphical User Interface [GUI], Mac OS, Linux).

### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

### **Microsoft Imagine Academy Resources**

**[4.070] Windows 7: Using Disks and Devices—Lesson 4**

[Windows 7 Lesson Plan: Using Disks and Devices](#)

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## **Task Number 41**

**Navigate the digital operating system environment.**

## Definition

Navigation should include using system utilities, system administrative tools, file structure tools, and hardware management tools and

- registry management (Windows)
- command-line management skills
- task and process management
- comparison of GUI and command line programs to perform file and administrative tasks.

## FBLA Competitive Events and Activities Areas

### Computer Applications

### Network Design

### Networking Concepts

### Word Processing

## Microsoft Imagine Academy Resources

[3.019] Configuring Disks and Device Drivers—E-Learning Module 1

[Configuring Disk Partitions on Client Computers Running Windows 7 Operating Systems](#)

[4.070] Windows 7: Using Disks and Devices—Lesson 4

[Windows 7 Lesson Plan: Using Disks and Devices](#)

[5.181] Windows 7 Higher Education: Lesson 4—Project 1

[Disk Management Snap-In \(project\)](#)

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## Task Number 42

**Demonstrate the procedures followed when installing digital operating systems.**

### Definition

Demonstration should include

- stopping unnecessary services
- removing unnecessary administrative rights from users
- removing unnecessary software
- locking down or hardening a desktop operating system.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

[3.041] **Installing, Upgrading and Migrating to Windows 7—E-Learning Module 1**  
[Learning the Key Features, Editions, and Hardware Requirements of Windows 7](#)

[4.068] **Windows 7: Installing Windows 7—Lesson 2**  
[Windows 7 Lesson Plan: Installing Windows 7](#)

[5.177] **Windows 7 Higher Education: Lesson 2—Project 1**  
[Upgrade and Clean Install \(project\)](#)

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## **Task Number 43**

### **Manage a file system structure.**

#### **Definition**

Management should include

- organizing files by various methods (e.g., create, modify, and delete)
- differentiating between a file system structure and an end-user file system structure
  - multiple drives (i.e., local, cloud)
  - hidden and protected files
  - directory permissions
  - Universal Naming Convention (UNC).

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

**[3.027] Configuring File Access and Printers on Windows 7 Client Computers—E-Learning Module 5**

[Managing File Access on a Windows 7 Client Computer](#)

**[4.070] Windows 7: Using Disks and Devices—Lesson 4**

[Windows 7 Lesson Plan: Using Disks and Devices](#)

**[5.181] Windows 7 Higher Education: Lesson 4—Project 1**

[Disk Management Snap-In \(project\)](#)

## **NBEA Achievement Standards for Information Technology**

**Apply path determination, routing, and addressing schemes to administer networks.**

**Manage files and folders.**

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## **Task Number 44**

### **Compare server operating systems.**

#### **Definition**

Comparison should include evaluating the benefits and limitations of current server operating systems, including

- Microsoft server operating systems
- Linux/UNIX distributions.

Note: Include general discussion of the general varieties of Linux distributions.

## **FBLA Competitive Events and Activities Areas**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

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## **Task Number 45**

### **Explain different types of drive partitions and file system formats.**

#### **Definition**

Explanation should include

- different types of drive partitions
- characteristics
- appropriate use cases
- master boot record (MBR)
- GUID partition table (GPT).

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Problem Solving**

##### **Network Design**

##### **Networking Concepts**

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## **Task Number 46**

### **Explain file system formats.**

#### **Definition**

Explanation should include characteristics, associated operating systems, and benefits and limitations of different file system formats. Explanation should also include

- File Allocation Table (FAT and FAT32)
- New Technology File System (NTFS)
- compact disc-read only memory (CD-ROM) file system (CDFS)
- Universal Disk Format (UDF)
- Linux ext variants (Ext2, Ext3, Ext4)
- High-Performance File System (HPFS)

- media access control (Mac).

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Computer Problem Solving**

### **Network Design**

### **Networking Concepts**

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## **Task Number 47**

### **Analyze current and emerging specialized server hardware.**

#### **Definition**

Analysis should include

- uses
- characteristics
- role in the network environment
- cost/benefit analysis
- hardware specifications (e.g., redundant array of independent disks [RAID], hot-swappable devices)
- importance of higher system requirements (e.g., symmetric multiprocessing [SMP], Small Computer System Interface [SCSI] storage, additional random access memory [RAM], or central processing unit [CPU]).

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Computer Problem Solving**

### **Network Design**

### **Networking Concepts**

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## **Task Number 48**

### **Manage partitions and volumes.**

#### **Definition**

Management should include

- devising a strategy that addresses the needs of the network and the number of partitions and volumes necessary to divide connections
- following established guidelines for creating partitions and volumes
- making partitions and volumes operational.

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Computer Problem Solving**

##### **Network Design**

##### **Networking Concepts**

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## **Task Number 49**

### **Explain the authentication of users in a network environment.**

#### **Definition**

Explanation should include the relationship among

- single or multi-factor authentication options
- the process for logging a user onto a server and network, based on the client service's software
- the server's security features
- the directory service's software being used (e.g., Active Directory [AD], Lightweight Directory Access Protocol [LDAP])
- multifactor authentication
- authorization.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

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### **Task Number 50**

#### **Install applications.**

##### **Definition**

Installation should include performing the steps required to successfully install additional client-services software in a heterogeneous environment, following the manufacturer's installation instructions (e.g., email, office productivity apps) and services (e.g., file sharing, printing) commonly found in a client-server environment.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

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## **Introducing Network Design Essentials**

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### **Task Number 51**



## **Define aspects of networks.**

### **Definition**

Definition should include

- local area network (LAN), wide area network (WAN), wireless local area network (WLAN), personal area network (PAN)
- benefits and limitations of each type
- components required to make a network operational
- typical hardware components
- sample business configurations
- communication medium (e.g., wired, wireless).

### **FBLA Competitive Events and Activities Areas**

#### **Computer Problem Solving**

#### **Network Design**

#### **Networking Concepts**

### **Microsoft Imagine Academy Resources**

**[2.025] Microsoft Digital Literacy: Computer Security and Privacy—Lesson 2**

[Protecting your Computer](#)

**[4.091] Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

### **NBEA Achievement Standards for Information Technology**

**Distinguish among network environments (e.g., peer-to-peer, client-server, thin client, n-tier, Internetworks, intranets, extranets).**

**Distinguish between local area network (LAN) and wide area network (WAN) topologies and protocols.**

**Identify components and characteristics of public networks (e.g., public telephone, cable, satellite, wireless) and their functions.**

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## **Task Number 52**

## **Define types of network architecture.**

### **Definition**

Definition should include

- architecture (e.g., peer-to-peer, server-based [domain controlled])
- sample business configurations
- benefits and limitations of each.

### **FBLA Competitive Events and Activities Areas**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

### **Microsoft Imagine Academy Resources**

[4.075] Windows 7: Windows 7 Workgroups and Domains—Lesson 9  
[Windows 7 Lesson Plan: Windows 7 Workgroups and Domains](#)

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## **Task Number 53**

### **Differentiate between distributed and centralized computing.**

#### **Definition**

Differentiation should include characteristics and advantages of

- distributed computing
- centralized computing
- cloud computing.

### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

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## **Task Number 54**

**Identify services delivered by a server.**

### **Definition**

Identification should include

- application
- communication
- domain/directory
- fax
- file
- print
- mail
- web
- database

and should also include ways to access various servers.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

**[4.097] Windows Server 2008 Network Infrastructure: Configuring Print Services—Lesson**

**7**

## **NBEA Achievement Standards for Information Technology**

**Describe server functions, including specialized servers (e.g., Web, DHCP, DNS, mail, proxy servers), and identify hardware and software requirements, such as RAID.**

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### **Task Number 55**

#### **Describe standard network LAN topologies.**

##### **Definition**

Description should include a comparison of the features, functions, characteristics, and financial considerations of network LAN topologies.

##### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

##### **Microsoft Imagine Academy Resources**

**[4.091] Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

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### **Task Number 56**

#### **Describe variations of standard topologies.**

##### **Definition**

Description should include a comparison of the features, functions, characteristics, and financial considerations of the variations of standard topologies (e.g., extended star, mesh, star bus).

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

**[4.091] Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

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## **Task Number 57**

**Describe the role of the network adapter.**

### **Definition**

Description should include

- relationships among other network elements
- tasks performed
- characteristics that may vary among different manufacturers' cards
- explanations of the MAC address and its uses
- media type (e.g., wired [fiber or copper attached], wireless, Bluetooth)
- connection type
- speed/bandwidth.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

**Microsoft Imagine Academy Resources**

**[4.091] Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

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## **Task Number 58**

**Describe the functions of networking infrastructure (e.g., adapter, router, switch, bridge, wireless access point).**

### **Definition**

Description should include

- network addressing
- media conversion
- address translation
- security
- protocol conversion and VPN
- packet routing.

**FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

**Microsoft Imagine Academy Resources**

## **Task Number 59**

**Describe the primary features of each major access method.**

### **Definition**

Description should include

- relationship among topologies, features, and benefits
- drawbacks of access methods
  - contention, including carrier-sense multiple access with collision detection (CSMA/CD) and carrier-sense multiple access with collision avoidance (CSMA/CA)
  - switching and routing
  - demand priority
  - polling
  - Multiprotocol Label Switching (MPLS)
  - Quality of Service (QoS).

### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

### **Microsoft Imagine Academy Resources**

# Exploring Networking Media

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## Task Number 60

**Define terms related to wired and wireless network media.**

### Definition

Definition of terms should include

- functions and characteristics
- 802.11 protocol and associated channels
- 802.3 (wired)
- interference, including electromagnetic frequency interference (EMI), radio frequency interference (RFI), and crosstalk
- frequency
- signal loss
- distance and attenuation
- wireless issues
  - channels
  - frequencies.

## FBLA Competitive Events and Activities Areas

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

## Microsoft Imagine Academy Resources

**[4.091] Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)



## **NBEA Achievement Standards for Information Technology**

**Apply basic networking terminology to a network environment.**

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### **Task Number 61**

#### **Identify the types and uses of wired network media.**

##### **Definition**

Identification should include

- discussion of and comparison among features, functions, and characteristics
- financial considerations of cable types
  - copper
  - coaxial
  - twisted pair cabling
  - fiber optic (single mode, multimode).

##### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

##### **Microsoft Imagine Academy Resources**

**[4.075] Windows 7: Windows 7 Workgroups and Domains—Lesson 9**

[Windows 7 Lesson Plan: Windows 7 Workgroups and Domains](#)

**[4.091] Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

## **NBEA Achievement Standards for Information Technology**

Identify, evaluate, and select communications media (guided and radiated) appropriate for a communications task (e.g., wireless, cat6, fiber).

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## **Task Number 62**

### **Identify the types and uses of wireless network media.**

#### **Definition**

Identification should include

- light fidelity (LiFi)
- wireless local area network (Wi-Fi)
- Bluetooth
- radio
- cellular.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

#### **Microsoft Imagine Academy Resources**

**[3.039] Configuring Wireless Network Connections—E-Learning Module 1**

[Configuring a Wireless Network Connection](#)

**[4.091] Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

#### **NBEA Achievement Standards for Information Technology**

Identify, evaluate, and select communications media (guided and radiated) appropriate for a communications task (e.g., wireless, cat6, fiber).

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## **Task Number 63**

### **Describe the concept of broadband.**

#### **Definition**

Description should include

- digital subscriber line (DSL), cable, fiber optics, high-speed wireless, transmission system lines 1 and 3 (T1 and T3)
- characteristics and functions of broadband transmissions
- different situations in which various incarnations of broadband might be used.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

#### **Microsoft Imagine Academy Resources**

**[3.040] Configuring Wireless Network Connections—E-Learning Module 2**

[Understanding the Standards and Technologies Related to Wireless Network Connections](#)

**[4.091] Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

#### **NBEA Achievement Standards for Information Technology**

**Identify network devices, including network connectivity hardware, and describe their functions.**

**Recognize the impact of the convergence of telephony, data, and video communications on networks.**

## **Task Number 64**

### **Describe the types of modems.**

#### **Definition**

Description should include

- characteristics and functions of modem communications
- standards
- carriers
  - analog
  - coaxial cable
  - asymmetric digital subscriber line (DSL)
  - Synchronous Optical Networking (SONET) for optical fiber
  - optical carrier (OC1, OC3) circuits.
  - Integrated Services Digital Network (ISDN), T1, T3 lines.

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Computer Problem Solving**

##### **Network Design**

##### **Networking Concepts**

##### **Word Processing**

#### **Microsoft Imagine Academy Resources**

**[4.091] Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

#### **NBEA Achievement Standards for Information Technology**

**Identify network devices, including network connectivity hardware, and describe their functions.**



# Understanding Networking Standards and Models

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## Task Number 65

### Describe each layer of the Open Systems Interconnection (OSI) model.

#### Definition

Description should include the

- identification of each layer
- primary function of each layer
- method of interaction between layers of computing and networking activities.

#### FBLA Competitive Events and Activities Areas

Computer Applications

Computer Problem Solving

Network Design

Networking Concepts

Word Processing

#### Microsoft Imagine Academy Resources

[4.091] Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

#### NBEA Achievement Standards for Information Technology

Compare and contrast the OSI model with protocols (e.g., TCP/IP, IPX/SPX).

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## **Task Number 66**

### **Describe devices in a network environment and their place in the OSI model.**

#### **Definition**

Description should include

- elements of a network environment
- explanation of each device's role
- each device's place in the OSI model
- switches
  - switch access
  - switch management
  - virtual LAN
  - trunking
  - spanning tree protocol
- routers
  - routing basics
  - routing protocols
  - network address translation
  - routing optimization
- firewalls
  - security appliances
  - firewall design and implementation.

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Computer Problem Solving**

##### **Network Design**

##### **Networking Concepts**

##### **Word Processing**

##### **Microsoft Imagine Academy Resources**

**[4.091] Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

## **NBEA Achievement Standards for Information Technology**

Compare and contrast the OSI model with protocols (e.g., TCP/IP, IPX/SPX).

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### **Task Number 67**

#### **Define the basic components of a network packet.**

##### **Definition**

Definition should include the common characteristics among basic components of a network packet and how the packets are transmitted on the network.

##### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

##### **Microsoft Imagine Academy Resources**

**[4.091] Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

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### **Task Number 68**

#### **Describe networking protocols.**

##### **Definition**

Description should include the

- characteristics of Internet Protocol (IP)
- Transmission Control Protocol/Internet Protocol (TCP/IP) versions 4 and 6
- User Datagram Protocol (UDP)
- roles in data transmission across networks.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

## **NBEA Achievement Standards for Information Technology**

**Compare and contrast the OSI model with protocols (e.g., TCP/IP, IPX/SPX).**

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## **Task Number 69**

**Map network processes.**

**Definition**

Mapping should include matching processes that use protocols to the appropriate OSI layers.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**



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## **Task Number 70**

### **Identify the workings of a WAN.**

#### **Definition**

Identification should include

- WAN topologies
- WAN connections
- Internet connectivity
- remote access
- Dynamic Host Control Protocol (DHCP)
- Domain Name Server (DNS).

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

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## **Conducting TCP/IP Activities**

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### **Task Number 71**

#### **Describe TCP/IP.**

##### **Definition**

Description should include

- the role TCP/IP plays as an industry-standard suite of protocols designed for WANs and the Internet
- the advantages of using TCP/IP.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

[3.032] **Configuring Network Connectivity—E-Learning Module 1**

[Configuring IPv4 Network Connectivity](#)

[4.091] **Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

[5.182] **Windows 7 Higher Education: Lesson 5—Exercise 1**

[OSI, IP, IPv4, IPv6 \(project\)](#)

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## **Task Number 72**

### **Compare static and dynamic IP routing.**

#### **Definition**

Comparison should include

- characteristics
- functions
- benefits
- shortcomings.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

### **Microsoft Imagine Academy Resources**

[3.034] **Configuring Network Connectivity—E-Learning Module 4**

[Implementing Automatic IP Address Allocation](#)

[4.095] **Windows Server 2008 Network Infrastructure: Configuring Routing and Remote Access (RRAS) and Wireless Networking—Lesson 5**

[Windows Server 2008 NI Lesson Plan: Configuring Routing and Remote Access \(RRAS\) and Wireless Networking](#)

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## **Task Number 73**

### **Configure TCP/IP.**

#### **Definition**

Configuration should include a static address including an IP address, subnet mask, and gateway.

### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

### **Microsoft Imagine Academy Resources**

[3.032] **Configuring Network Connectivity—E-Learning Module 1**

[Configuring IPv4 Network Connectivity](#)

[4.071] Windows 7: Network Connectivity—Lesson 5

[Windows 7 Lesson Plan: Network Connectivity](#)

[5.182] Windows 7 Higher Education: Lesson 5—Exercise 1

[OSI, IP, IPv4, IPv6 \(project\)](#)

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## **Task Number 74**

**Test a TCP/IP configuration, using operating-system-specific commands.**

### **Definition**

Testing should include using operating-system-specific commands (e.g., ping, network statistics [netstat], nbstat, ipconfig/ifconfig, trace route [TRACERT], route, nslookup).

### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

### **Microsoft Imagine Academy Resources**

[3.032] Configuring Network Connectivity—E-Learning Module 1

[Configuring IPv4 Network Connectivity](#)

[5.182] Windows 7 Higher Education: Lesson 5—Exercise 1

[OSI, IP, IPv4, IPv6 \(project\)](#)

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## **Task Number 75**

**Identify the network and host identifications' TCP/IP addresses.**

## **Definition**

Identification should include the requirements for addresses, based on class addresses.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

**[3.032] Configuring Network Connectivity—E-Learning Module 1**

[Configuring IPv4 Network Connectivity](#)

**[4.071] Windows 7: Network Connectivity—Lesson 5**

[Windows 7 Lesson Plan: Network Connectivity](#)

**[5.182] Windows 7 Higher Education: Lesson 5—Exercise 1**

[OSI, IP, IPv4, IPv6 \(project\)](#)

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## **Task Number 76**

### **Compare IPv4 and IPv6.**

#### **Definition**

Comparison should include features of and anticipated developments in IPv4 and IPv6.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

Word Processing

## Microsoft Imagine Academy Resources

[3.032] Configuring Network Connectivity—E-Learning Module 1  
[Configuring IPv4 Network Connectivity](#)

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### Task Number 77

**Explain the function of a subnet mask and classless inter-domain routing (CIDR) format.**

#### Definition

Explanation of a subnet mask should include the concept that it divides a network into segments and reduces network traffic by blocking a portion of the IP address, so the TCP/IP can distinguish the network ID from the host ID.

Explanation of a CIDR format should include the concept that it identifies the subnet mask.

## FBLA Competitive Events and Activities Areas

Computer Applications

Computer Problem Solving

Network Design

Networking Concepts

Word Processing

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### Task Number 78

**Describe a loopback address.**

#### Definition

Description should include how the

- TCP/IP information travels down the protocol layers to the IP layer
- IP layer encapsulates the information in a datagram
- host sends the IP datagram to a loopback address
- loopback range tests a TCP/IP protocol implementation on a host
- loopback interface provides function without using underlying layers
- loopback adapter's purpose and function interact
- addresses of the loopback adapter in IPv4 and IPv6 are used.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Computer Problem Solving**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

## **Task Number 79**

### **Describe the services provided by Network Basic Input/Output System (NetBIOS) over TCP/IP.**

#### **Definition**

Description should include

- network registration and verification
- session establishment and termination
- reliable connection-oriented session data transfer
- unreliable connectionless datagram data transfer
- protocol support (driver)
- adapter monitoring and management.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

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## **Task Number 80**

**Explain the process of host name resolution.**

### **Definition**

Explanation should include

- typing a command, using the name assigned to the destination host
- resolving the host name to an IP address
- resolving the IP address to a hardware address
- mapping a host name to an IP address on local and remote networks.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

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## **Task Number 81**

**Modify the host's file to resolve host names.**

### **Definition**

Modification should include changing the host's file, according to network operating system requirements.



## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

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### **Task Number 82**

#### **Configure File Transfer Protocol (FTP).**

##### **Definition**

Configuration should include using administrative tools and adhering to the network operating system's requirements and procedures.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

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### **Task Number 83**

#### **Explain the purpose of the Simple Network Management Protocol (SNMP).**

##### **Definition**

Explanation should include

- managing requests for status information from multiple hosts

- reporting significant events (traps) to multiple hosts
- using hosts' names and IP addresses to identify the hosts from which SNMP receives requests and to which SNMP reports information
- enabling monitoring of TCP/IP performance using Windows Performance Monitor.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

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## **Task Number 84**

**Describe the implementation of a virtual LAN (VLAN).**

### **Definition**

Description should include

- uses of VLAN (e.g., securely segmenting LANs for effective TCP/IP management)
- considerations and requirements for the implementation of VLAN.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

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## **Ensuring Network Security**

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## **Task Number 85**

### **Monitor network traffic.**

#### **Definition**

Monitoring should include interpreting network traffic using a protocol analyzer (e.g., network monitor [Windows], Wireshark [open source], or tcpdump).

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

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## **Task Number 86**

### **Analyze network systems for security vulnerabilities.**

#### **Definition**

Analysis of systems should include detecting vulnerabilities by using

- port scanning (i.e., Network Mapper [Nmap])
- software update services
- baseline creation
- Nessus Vulnerability Scanning
- other tools, such as Microsoft Baseline Security Analyzer (MBSA).

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Cyber Security**

**Network Design**

**Networking Concepts**

**Word Processing**

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## **Task Number 87**

**Explain the core security principles used in network management.**

### **Definition**

Explanation should include

- authentication, authorization, and accounting (AAA)
- confidentiality, integrity, and availability (CIA Triad).

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Cyber Security**

**Network Design**

**Networking Concepts**

**Word Processing**

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## **Task Number 88**

**Analyze threats and risks to networks and local account policies.**

## **Definition**

Analysis of threats and risks should include

- differentiating between a threat and a risk
- identifying internal and external
- rating them
- reporting them to risk management.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Cyber Security**

**Network Design**

**Networking Concepts**

**Word Processing**

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## **Task Number 89**

**Analyze internal and external threats to computer networks.**

### **Definition**

Analysis should include threats from employees, natural disasters, and unknown hackers.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Cyber Security**

**Network Design**

**Networking Concepts**

## **Task Number 90**

### **Identify strategies to mitigate risk.**

#### **Definition**

Identification of risks should include

- avoidance
- transfer
- mitigation
- acceptance.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Computer Problem Solving**

### **Cyber Security**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

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## **Task Number 91**

### **Identify sustainable computer networking practices.**

#### **Definition**

Identification should include

- virtualized operating systems
- paperless solutions
- power usage

- wake on LAN
- thin clients.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Computer Problem Solving**

### **Cyber Security**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

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## **Task Number 92**

### **Install a virtualized operating system.**

#### **Definition**

Installation should include using one of the following

- Hyper-V (Microsoft)
- VMware
- Virtual PC
- VirtualBox (open source)
- or another tool, as appropriate.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Computer Problem Solving**

### **Cyber Security**

### **Network Design**

### **Networking Concepts**

## **Task Number 93**

**Describe the different types of network adapter modes for virtual operating systems.**

### **Definition**

Description should include

- bridged mode
- network address translation (NAT) mode
- host-only mode.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Computer Problem Solving**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

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## **Task Number 94**

**Incorporate security scanning tools such as Intrusion Detection System (IDS) and Intrusion Prevention System (IPS) and/or security appliances.**

### **Definition**

Incorporation should include

- differentiation between an IDS and IPS



- benefits and drawbacks of all-in-one security appliances.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

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## **Task Number 95**

**Identify threats and vulnerabilities from users.**

### **Definition**

Identification should include

- differentiating between a threat and a vulnerability
- insider threats
- employee errors
- poor management
  - poor policy creation
  - unused accounts
  - poor password selection
  - other.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

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## **Task Number 96**

### **Identify security measures to physical threats to network systems.**

#### **Definition**

Identification should include

- locks
- use of mantraps
- use of security cameras
- clean desk policies.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

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## **Task Number 97**

### **Identifying other risks and threats to systems.**

#### **Definition**

Identification should include

- wireless rogue networks
- bring your own device (BYOD)
- Internet of things (IoT) devices.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

**Network Design**

**Networking Concepts**

**Word Processing**

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# **Providing Basic User Training and Support**

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## **Task Number 98**

### **Identify training needs.**

#### **Definition**

Identification should include

- login steps
- FTP
- print operations
- acceptable use of systems and information
- steps to secure data and access data backups
- security awareness.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Computer Problem Solving**

### **Cyber Security**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Introduction to Business Procedures**

**Job Interview**

**Network Design**

**Networking Concepts**

**Word Processing**

## **NBEA Achievement Standards for Information Technology**

**Explain the need for lifelong learning and professional growth.**

**Identify, evaluate, and select training resources to meet user needs.**

**Identify, evaluate, and use resources (e.g., hardware, software, and online) for problem identification and resolution.**

**Select training venues appropriate to learners (e.g., online, over-the-shoulder, distance learning, text based, and multimedia).**

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## **Task Number 99**

**Provide an orientation to a network system (system onboarding).**

### **Definition**

Provision should include an orientation involving the use of a well-organized network system guide that articulates

- procedures to log in to the network
- methods used to access resources on the network
- processes used to resolve common problems
- security considerations.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Computer Problem Solving**

## **Cyber Security**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Introduction to Business Procedures**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

## **NBEA Achievement Standards for Information Technology**

**Create learning objects to facilitate user training.**

**Develop help-desk procedures.**

**Identify, evaluate, and use resources (e.g., hardware, software, and online) for problem identification and resolution.**

---

## **Task Number 100**

### **Develop a training plan.**

#### **Definition**

Development should include

- determining the appropriate and relevant subject matter
- identifying the expected results of the training
- selecting the trainees and trainers
- providing the method and mode of training (e.g., one-to-one, hands-on, seminar)
- assessing the users' prior knowledge of and experience with the subject matter.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Computer Problem Solving**

## **Cyber Security**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Introduction to Business Procedures**

## **Network Design**

### **Networking Concepts**

### **Word Processing**

## **NBEA Achievement Standards for Information Technology**

**Develop help-desk procedures.**

**Plan, design, deliver, and evaluate user training.**

---

## **Task Number 101**

### **Provide training to users.**

#### **Definition**

Provision should include following a training plan and giving users the opportunity to demonstrate what they learn.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

#### **Computer Problem Solving**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Introduction to Business Procedures**

### **Word Processing**

## **NBEA Achievement Standards for Information Technology**

**Plan, design, deliver, and evaluate user training.**

**Select training venues appropriate to learners (e.g., online, over-the-shoulder, distance learning, text based, and multimedia).**

**Tutor others in information technology skills.**

**Work in a team to solve problems and share knowledge.**

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## **Task Number 102**

### **Create a user manual.**

#### **Definition**

Creation of a user manual should include

- selecting topics
- creating an outline
- writing descriptions and instructions for the selected topics
- incorporating illustrations, where appropriate
- testing the accuracy and ease of use.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Computer Problem Solving**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Introduction to Business Procedures**

### **Job Interview**

### **Word Processing**

## **NBEA Achievement Standards for Information Technology**

Write organization policy for the legal and ethical use of information (e.g., code of ethics).

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## **Task Number 103**

### **Provide ongoing basic user support.**

#### **Definition**

Provision should include assisting users with technology problems by providing access to a support person during core business hours and understanding the

- established troubleshooting procedures
- need for effective communication skills
- need for sensitivity to user needs and frustrations
- need for patience with users who do not have a high level of computer experience
- service level agreements (SLA).

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Computer Problem Solving**

##### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

##### **Introduction to Business Procedures**

##### **Word Processing**

#### **NBEA Achievement Standards for Information Technology**

**Identify and use help-desk software.**

**Identify, evaluate, and select training resources to meet user needs.**

**Plan, design, deliver, and evaluate user training.**

**Work in a team to solve problems and share knowledge.**

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# Performing Legal and Ethical Functions

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## Task Number 104

**Identify copyright and licensing laws that apply to computer use and network administration.**

### Definition

Identification should include laws and regulations that govern the use of software, information (i.e., text), and graphics.

### FBLA Competitive Events and Activities Areas

**Business Communication**

**Business Ethics**

**Business Law**

**Computer Applications**

**Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

### Microsoft Imagine Academy Resources

[2.028] Microsoft Digital Literacy: Computer Security and Privacy—Lesson 5  
[Computer Ethics](#)

**NBEA Achievement Standards for Information Technology**

**Analyze legal and ethical dilemmas within the framework of current laws and legislation (e.g., virus development, hacking, threats, phishing).**

**Compare and contrast various types of license agreements (e.g., open source, multiple license agreements, single-user installation, site license).**

**Demonstrate legal and ethical behaviors when using information technologies.**

**Discuss copyright rules and regulations (e.g., images, music, video, software).**

**Explain the consequences of illegal and unethical use of information technologies (e.g., piracy; illegal downloading; licensing infringement; inappropriate use of software, hardware, and mobile devices).**

**Read, interpret, and adhere to software license agreements and legal mandates (e.g., ADA, Sarbanne-Oxly).**

**Write organization policy for the legal and ethical use of information (e.g., code of ethics).**

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## **Task Number 105**

### **Describe procedures to ensure the proper licensing of a client-server operating system and applications.**

#### **Definition**

Description should include steps for developing a method for tracking server connection and software licenses and identifying unlicensed versions of software.

#### **FBLA Competitive Events and Activities Areas**

##### **Business Communication**

##### **Business Ethics**

##### **Business Law**

##### **Computer Applications**

##### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

##### **Introduction to Business Procedures**

**Network Design**

**Word Processing**

**Microsoft Imagine Academy Resources**

[2.028] Microsoft Digital Literacy: Computer Security and Privacy—Lesson 5  
[Computer Ethics](#)

**NBEA Achievement Standards for Information Technology**

**Analyze legal and ethical dilemmas within the framework of current laws and legislation (e.g., virus development, hacking, threats, phishing).**

**Compare and contrast various types of license agreements (e.g., open source, multiple license agreements, single-user installation, site license).**

**Read, interpret, and adhere to software license agreements and legal mandates (e.g., ADA, Sarbanne-Oxly).**

**Write organization policy for the legal and ethical use of information (e.g., code of ethics).**

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## **Task Number 106**

**Identify ethical behavior that is expected of users and administrators.**

### **Definition**

Identification should include listing ethical concerns that an administrator will encounter and be expected to handle responsibly, such as

- privacy issues
- nondisclosure of confidential information
- legal use of copyrighted material
- personally identifiable information (PII) (e.g., phone numbers, social security numbers, date of birth).

**FBLA Competitive Events and Activities Areas**

**Business Communication**

**Business Ethics**

**Business Law**

**Computer Applications**

**Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

**Introduction to Business Procedures**

**Network Design**

**Word Processing**

**NBEA Achievement Standards for Information Technology**

**Analyze legal and ethical dilemmas within the framework of current laws and legislation (e.g., virus development, hacking, threats, phishing).**

**Demonstrate legal and ethical behaviors when using information technologies.**

**Explain the consequences of illegal and unethical use of information technologies (e.g., piracy; illegal downloading; licensing infringement; inappropriate use of software, hardware, and mobile devices).**

**Write organization policy for the legal and ethical use of information (e.g., code of ethics).**

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## **Task Number 107**

**Describe procedures for documentation found in network policies.**

### **Definition**

Description should include

- documentation of the network
- policies and procedures to maintain and update the network
  - change of personnel in the event of disaster

- network penetration
- safety assurance
- risk management
- security policies.

## **FBLA Competitive Events and Activities Areas**

**Business Communication**

**Business Ethics**

**Business Law**

**Computer Applications**

**Cyber Security**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

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## **Task Number 108**

### **Explain network hardening.**

#### **Definition**

Explanation should include

- methods of detection/prevention
- response techniques and options according to intruder detection
- penetration testing
- how network hardening reduces vulnerability.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Introduction to Business Procedures**

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## **Task Number 109**

### **Manage a network.**

#### **Definition**

Management should include

- update management
- data protection
- remote management
- mobile device management
- data center management
- monitoring
- log file management
- network management with SNMP.

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Cyber Security**

##### **Introduction to Business Procedures**

##### **Network Design**

##### **Networking Concepts**

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## **Task Number 110**

### **Optimize a network.**

#### **Definition**

Optimization should include

- ensuring optimal usage for system resources
- troubleshooting the network.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

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# **Preparing for Industry Certification**

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## **Task Number 111**

**Describe the process and requirements for obtaining industry certifications.**

### **Definition**

Description should include

- list of industry certifications
- process/requirements for obtaining the certifications
- official websites of the testing organization/vendor
- materials from publishers that have developed practice materials and tests based on information from the testing organization/vendor
- information from certified instructors or industry-certified professionals
- information from the Virginia Department of Education's Administrative Planning Guide
- information in the "Introduction/Course Description" section of this document.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Job Interview**

**Network Design**

**Networking Concepts**

**Microsoft Imagine Academy Resources**

**[2.052] Microsoft Learning: Test Your Knowledge**

[Test Your Knowledge Web Site](#)

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## **Task Number 112**

**Identify testing skills/strategies for a certification examination.**

### **Definition**

Identification should be undertaken by

- conducting an Internet research project
- reviewing materials from exam and practice-exam publishers
- interviewing certified instructors and/or industry-certified professionals.

**FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Job Interview**

**Network Design**

**Networking Concepts**

**Microsoft Imagine Academy Resources**

**[2.053] Get started with Microsoft Certification**

[Get started with Microsoft Certification Web Page](#)



## **NBEA Achievement Standards for Information Technology**

**Obtain industry certification in one or more information technology areas.**

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### **Task Number 113**

**Demonstrate ability to complete selected practice examinations (e.g., practice questions similar to those on certification exams).**

#### **Definition**

Demonstration should include successfully completing practice examinations for selected certifications related to the course obtained from vendor sites and/or materials from publishers. The level of performance on a practice examination serves as a gauge of the applicant's readiness for formal industry testing.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Job Interview**

**Network Design**

**Networking Concepts**

#### **Microsoft Imagine Academy Resources**

**[2.052] Microsoft Learning: Test Your Knowledge**

[Test Your Knowledge Web Site](#)

## **NBEA Achievement Standards for Information Technology**

**Obtain industry certification in one or more information technology areas.**

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### **Task Number 114**

## **Complete an industry certification examination representative of skills learned in this course.**

### **Definition**

Completion of an industry certification examination is achieved when the student applicant earns an examination score deemed "passing" by the testing organization.

Qualifying examinations are those currently approved at the state level as representative of Cybersecurity Software Operations skills. (These may be found in the Virginia Department of Education's Administrative Planning Guide.)

Students should be encouraged to attain industry certification as evidence of their computer network software operations skill level and general employability.

### **FBLA Competitive Events and Activities Areas**

#### **Computer Applications**

#### **Job Interview**

#### **Network Design**

#### **Networking Concepts**

### **Microsoft Imagine Academy Resources**

**[2.052] Microsoft Learning: Test Your Knowledge**

[Test Your Knowledge Web Site](#)

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## **Developing Employability Skills**

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### **Task Number 115**

### **Research careers in networking and systems security.**

#### **Definition**

Researching should include

- exploring advancement opportunities
- analyzing employment trends
- utilizing job databanks to match personal abilities, aptitudes, and job expectations with industry standards.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Electronic Career Portfolio**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Job Interview**

### **Network Design**

### **Networking Concepts**

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## **Task Number 116**

### **Compose a résumé for electronic processing.**

#### **Definition**

Composition should include

- educational background
- work history
- honors and awards
- extracurricular activities (e.g., membership in clubs, leadership positions held, community service).

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Electronic Career Portfolio**

### **Future Business Leader**

**Job Interview**

## **Microsoft Imagine Academy Resources**

[2.058] Student Career Portal—Get Started  
[Get Started Web Page](#)

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## **Task Number 117**

**Assemble a professional portfolio that contains representative samples of student work.**

### **Definition**

Assembly should include a

- résumé in a format suitable for online posting
- combination of electronic and non-electronic documents that reflect the student's knowledge, skills, and abilities
- representation of the student's work (e.g., program design, source code, technical documentation, output).

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Electronic Career Portfolio**

**Network Design**

**Networking Concepts**

**Word Processing**

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## **Task Number 118**

**Create a cover letter to accompany a résumé.**

## **Definition**

Creation of a cover letter should include

- following the business letter format
- writing three or four short paragraphs emphasizing salient résumé points
- indicating familiarity with the company
- indicating whether applying for the position is confidential
- explaining why the position is desired
- addressing the letter to the appropriate individual.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Electronic Career Portfolio**

### **Future Business Leader**

### **Job Interview**

## **Microsoft Imagine Academy Resources**

[2.058] Student Career Portal—Get Started  
[Get Started Web Page](#)

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## **Task Number 119**

### **Complete manual and electronic application forms.**

#### **Definition**

Completion of manual applications should include

- finishing all sections of employment applications (i.e., name, address, education, work experiences, job title, references, other qualifications)
- utilizing good penmanship
- being prepared (i.e., having copies of résumé and all other relevant information)
- securing references (i.e., obtaining permission before using).

Completion of electronic applications should

- include providing complete, accurate, and effectively organized information

- consideration of criteria specifically related to the electronic transmittal of application information (e.g., attention to security concerns, inclusion of keywords to enhance interest in the application, use of scanner-friendly format).

## **FBLA Competitive Events and Activities Areas**

**Business Communication**

**Computer Applications**

**Electronic Career Portfolio**

**Future Business Leader**

**Job Interview**

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## **Task Number 120**

### **Participate in an internship program.**

#### **Definition**

Participation should include

- finding an internship program within the field
- following an instructor's or counselor's guidance
- obtaining consent from parent(s) or legal guardian(s)
- committing to the internship contract.

## **FBLA Competitive Events and Activities Areas**

**Business Communication**

**Computer Applications**

**Electronic Career Portfolio**

**Future Business Leader**

**Job Interview**

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## **Task Number 121**

### **Research a company in preparation for a job interview.**

#### **Definition**

Research should include utilizing electronic and printed resources and

- gathering background information through website home page, annual reports, human resources' department)
- focusing on the company's mission, history, vision, and additional information.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Electronic Career Portfolio**

**Future Business Leader**

**Job Interview**

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## **Task Number 122**

### **Participate in a mock interview.**

#### **Definition**

Participation should include

- playing a variety of roles in the interview to assess behaviors that are both desirable (e.g., maintaining eye contact, asking informed questions) and undesirable (e.g., speaking too softly, failing to answer questions completely)
- utilizing technical terms/knowledge when answering questions
- displaying knowledge of company.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Electronic Career Portfolio**

**Future Business Leader**

**Job Interview**

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## **Task Number 123**

**Compose an interview follow-up letter.**

### **Definition**

Composition should include

- following the business letter format
- expressing appreciation for the opportunity to interview
- reminding the interviewer of the qualifications that were discussed
- confirming interest in the job
- requesting further action (e.g., second interview or meeting).

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Electronic Career Portfolio**

**Future Business Leader**

**Job Interview**

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## **Task Number 124**

**Identify the steps to follow when resigning from a position.**

### **Definition**

Identification should include

- preparing a sample oral and/or written resignation
- providing ample time to find a replacement (usually two weeks)
- offering to train the replacement.



## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Electronic Career Portfolio**

**Future Business Leader**

**Job Interview**

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## **Task Number 125**

**Identify potential employment barriers for nontraditional groups and ways to overcome these barriers.**

### **Definition**

Identification of potential employment barriers should include

- gender
- ethnicity
- age
- discrimination in hiring or promoting practices.

Identification of ways to overcome the barriers should include

- scholarships
- job training programs
- mentorships
- minority assistance programs.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Electronic Career Portfolio**

**Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

**Job Interview**

## SOL Correlation by Task

39	Navigate an end user's digital operating system network/environment.	
40	Compare current digital operating systems.	English: 11.3, 11.5, 12.3, 12.5
41	Navigate the digital operating system environment.	
42	Demonstrate the procedures followed when installing digital operating systems.	
43	Manage a file system structure.	
44	Compare server operating systems.	English: 11.1, 11.5, 12.1, 12.5
45	Explain different types of drive partitions and file system formats.	English: 11.5, 12.5
46	Explain file system formats.	English: 11.5, 11.8, 12.5, 12.8
47	Analyze current and emerging specialized server hardware.	
48	Manage partitions and volumes.	English: 11.5, 12.5
49	Explain the authentication of users in a network environment.	English: 11.2, 11.5, 12.2, 12.5
50	Install applications.	English: 11.5, 12.5
51	Define aspects of networks.	English: 11.3, 11.5, 12.3, 12.5
52	Define types of network architecture.	English: 11.3, 11.5, 12.3, 12.5
53	Differentiate between distributed and centralized computing.	English: 11.5, 12.5
54	Identify services delivered by a server.	History and Social Science: VUS.14
55	Describe standard network LAN topologies.	English: 11.5, 12.5
56	Describe variations of standard topologies.	English: 11.5, 12.5
57	Describe the role of the network adapter.	English: 11.5, 12.5
58	Describe the functions of networking infrastructure (e.g., adapter, router, switch, bridge, wireless access point).	English: 11.5, 12.5
59	Describe the primary features of each major access method.	English: 11.5, 12.5
60	Define terms related to wired and wireless network media.	English: 11.3, 11.5, 12.3, 12.5
61	Identify the types and uses of wired network media.	
62	Identify the types and uses of wireless network media.	
63	Describe the concept of broadband.	English: 11.5, 12.5
64	Describe the types of modems.	English: 11.2, 11.5, 12.2, 12.5

65	Describe each layer of the Open Systems Interconnection (OSI) model.	English: 11.5, 12.5
66	Describe devices in a network environment and their place in the OSI model.	English: 11.5, 12.5
67	Define the basic components of a network packet.	English: 11.3, 11.5, 12.3, 12.5
68	Describe networking protocols.	English: 11.5, 12.5
69	Map network processes.	
70	Identify the workings of a WAN.	
71	Describe TCP/IP.	English: 11.5, 12.5
72	Compare static and dynamic IP routing.	English: 11.5, 12.5
73	Configure TCP/IP.	
74	Test a TCP/IP configuration, using operating-system-specific commands.	
75	Identify the network and host identifications' TCP/IP addresses.	
76	Compare IPv4 and IPv6.	English: 11.5, 12.5
77	Explain the function of a subnet mask and classless inter-domain routing (CIDR) format.	English: 11.5, 12.5
78	Describe a loopback address.	English: 11.5, 12.5
79	Describe the services provided by Network Basic Input/Output System (NetBIOS) over TCP/IP.	English: 11.5, 12.5
80	Explain the process of host name resolution.	English: 11.5, 12.5
81	Modify the host's file to resolve host names.	
82	Configure File Transfer Protocol (FTP).	
83	Explain the purpose of the Simple Network Management Protocol (SNMP).	English: 11.5, 12.5
84	Describe the implementation of a virtual LAN (VLAN).	English: 11.5, 12.5
85	Monitor network traffic.	
86	Analyze network systems for security vulnerabilities.	
87	Explain the core security principles used in network management.	English: 11.5, 12.5
88	Analyze threats and risks to networks and local account policies.	
89	Analyze internal and external threats to computer networks.	
90	Identify strategies to mitigate risk.	
91	Identify sustainable computer networking practices.	
92	Install a virtualized operating system.	
93	Describe the different types of network adapter modes for virtual operating systems.	English: 11.5, 12.5
94	Incorporate security scanning tools such as Intrusion Detection System (IDS) and Intrusion Prevention System (IPS) and/or security appliances.	
95	Identify threats and vulnerabilities from users.	

96	Identify security measures to physical threats to network systems.	
97	Identifying other risks and threats to systems.	
98	Identify training needs.	
99	Provide an orientation to a network system (system onboarding).	English: 11.5, 12.5
100	Develop a training plan.	English: 11.5, 12.5
101	Provide training to users.	
102	Create a user manual.	English: 12.1, 12.6, 12.7
103	Provide ongoing basic user support.	
104	Identify copyright and licensing laws that apply to computer use and network administration.	English: 11.5, 11.8, 12.5, 12.8
105	Describe procedures to ensure the proper licensing of a client-server operating system and applications.	English: 11.5, 12.5
106	Identify ethical behavior that is expected of users and administrators.	
107	Describe procedures for documentation found in network policies.	English: 11.5, 12.5
108	Explain network hardening.	English: 11.5, 12.5
109	Manage a network.	
110	Optimize a network.	
111	Describe the process and requirements for obtaining industry certifications.	English: 11.5, 12.5
112	Identify testing skills/strategies for a certification examination.	English: 11.5, 11.8, 12.5, 12.8  History and Social Science: GOVT.1, VUS.1, WHIL.1
113	Demonstrate ability to complete selected practice examinations (e.g., practice questions similar to those on certification exams).	English: 11.5, 12.5
114	Complete an industry certification examination representative of skills learned in this course.	English: 11.5, 12.5
115	Research careers in networking and systems security.	English: 11.5, 12.5
116	Compose a résumé for electronic processing.	English: 11.6, 11.7, 12.6, 12.7
117	Assemble a professional portfolio that contains representative samples of student work.	English: 11.6, 11.7, 12.6, 12.7
118	Create a cover letter to accompany a résumé.	English: 11.6, 11.7, 12.6, 12.7
119	Complete manual and electronic application forms.	English: 11.1, 11.6, 11.7, 12.1, 12.6, 12.7
120	Participate in an internship program.	

121	Research a company in preparation for a job interview.	English: 11.5, 11.8, 12.5, 12.8
122	Participate in a mock interview.	English: 11.1, 12.1
123	Compose an interview follow-up letter.	English: 11.6, 11.7, 12.6, 12.7
124	Identify the steps to follow when resigning from a position.	
125	Identify potential employment barriers for nontraditional groups and ways to overcome these barriers.	

## Teacher Resources

### Instructional Scenarios

#### Trade Secrets

##### **Duty/Concept areas addressed:**

*Installing Network Operating System and Services*

*Performing Network Administration Functions*

*Introducing Basic Server Systems Concepts*

*Performing Network Management and Security Functions*

*Providing Basic User Training and Support*

*Note: This Cybersecurity Software Operations scenario could be an ongoing project or culminating project.*

A national ad agency has just set up a local office in your town. The agency has a small network that consists of three personal computers with Windows XP operating systems, a file server, two printers, and a main server. The network has been constructed and connected, but no user accounts or permissions have been initiated. The receptionist should be able to view the contact information of current clients, to enter contact information for new clients, and to enter appointments on a shared calendar. The account associate should have higher-level access in order to check the status of jobs and payment histories in the course of handling customer and vendor questions. The account manager should have access to all data available. Everyone in the office shares the two printers. The account manager would also like to have some sort of interoffice "chat" program so that associates can communicate without the distraction of phones or intercoms.

The account manager is concerned about network security, given that client files are kept online and the main server has a secure connection to the parent company. Data is confidential, personal, and sensitive. Therefore, any breach in security could damage the entire company's reputation.

**Big Question:** How will you set up the network with the various levels of access while protecting important confidential information?

## **Focused Questions:**

1. What are the various levels of access needed?
2. How many user accounts will be needed?
3. How should the printers be shared?
4. What plan will you create to ensure that the ad agency's data is secure?
5. What is the timeline attached to the implementation of the plan?
6. What elements should be involved in the design of the backup plan?

## **Project-Based Assessment**

1. Construct a model or diagram for the office, including network design and access levels.
2. Conduct research to find information about network security.
3. Write a report on a network security breach.

## **Resource**

Microsoft Tech Net

<http://technet.microsoft.com/en-us/default.aspx>

## **Next Step: Certification**

### **Duty/Concept areas addressed:**

*Performing Legal and Ethical Functions*

*Preparing for Industry Certification*

*Developing Employability Skills*

*Note: This Cybersecurity Software Operations scenario could be an ongoing project or culminating project.*

You have just been hired as a network administrator-in-training for a small real estate company. You only work part-time, keeping the small office running, but the real estate agent has plans to double office space within the next 15 months and add three more assistants to help serve his growing client base. Currently you have four PCs, two network printers, and one server. You have already set up network access for each of the four current users and all equipment is working fine. Now, you must implement a new network design for all components.

One condition of your employment is that you obtain industry certification as a systems administrator within six months. In your spare time, you begin to research certifications in your field and try to decide which certification would most complement the role you want to fill.

Because your boss is always interested in new technology, you often have conversations about the latest and greatest technology tools. In a recent chat, you talked about the explosion of file sharing on peer-to-peer networks and the legal and ethical implications. Each month, your boss hosts a dinner meeting of area real estate brokers and he asks you to give an informal presentation on the certification you are pursuing and the security implications for file sharing,

namely, unlicensed software on company computers, in the real estate industry.

**Big Question:** What information will your presentation contain?

**Focused Questions:**

1. Which certification is most appropriate to the functions you will be performing as a network systems administrator?
2. What is a peer-to-peer file sharing network?
3. How could the peer-to-peer file sharing network affect businesses?
4. What are the network security risks?
5. Should company computers be protected from workers downloading unauthorized software? Why or why not?
6. How will anyone know your employees are using unlicensed software?
7. What would happen if the authorities discovered your employees are using unlicensed software?
8. What key elements will go into your presentation outline?

**Project-Based Assessment**

Oral presentation and critique

**Resources**

- Featured Cisco Certification Schools in Virginia:  
<http://www.computertrainingschools.com/search/VA/C/>
- Directory of Virginia Computer Training Institutes & Computer Schools  
<http://www.computerschools.com/states/virginia-computer-training-institutes-schools.html>
- Advanced Technology Systems (Virginia Beach)  
<http://www.vbatc.com/a-infotech.html>
- Industry Certification Programs Offered at Virginia Western Community College  
<http://www.vw.vccs.edu/Pages/BREW/Certification.html>
- Free Certification Tutorials, Articles, and Online Courses  
<http://www.learnthat.com/certification/>

**The Insurance Agent**

**Duty/Concept areas addressed:**

*Introducing Basic Server Systems Concepts*

*Introducing Network Design Essentials*

*Exploring Network Media*

*Networking Standards and Models*

*Installing Network Operating System and Services*

*Providing Basic User Training and Support*

*Note: This Cybersecurity Software Operations scenario could be an ongoing project or*

*culminating project.*

Your best friend's father is an insurance agent. He just discovered that you are learning about computer networking. One day he calls you and invites you to stop by his new office. He tells you he would like your help setting up a network for his office. He would also like to learn enough about networking in the process to address problems that may arise.

Upon arriving at the office, you learn that the small building was constructed 15 years ago and does not have any network wiring. Your friend's dad has three personal computers with Windows XP operating systems, a network printer, an all-in-one copier/fax/printer, a file server, and a server that connects to each of the three computers and has a remote access connection to the agency's parent company.

Your friend's father employs an assistant and an office receptionist. Each has a separate office. There is also a small utility-type room that currently doubles as a break room and storage closet.

Not only will you be setting up the network, but you will also be setting up the three computers, the printer, and the server.

**Big Question:** How would you design a network for this insurance office and how will you teach the agent about the essentials of computer networking?

### **Focused Questions**

1. What is the first thing you would do in this situation?
2. What would a sketch of the network design look like?
3. What hardware and software might be needed?
4. What are the essential networking concepts that you will teach your friend's father?
5. What is your plan for installing and connecting the network?

### **Project-Based Assessment**

1. Sketch of the network
2. PowerPoint explaining the terminology and the essentials of computer networking

## **Entrepreneurship Infusion Units**

Entrepreneurship Infusion Units may be used to help students achieve additional, focused competencies and enhance the validated tasks/competencies related to identifying and starting a new business venture. Because the unit is a complement to certain designated courses and is not mandatory, all tasks/competencies are marked “optional.”

## **Curriculum Resources**



[The Academic Initiative of the Cyber Innovation Center](#) offers access to its curricula at no cost to K-12 teachers. These lessons could be used to supplement the following tasks:

- Task 40: Describe cybersecurity threats to an organization. (How Businesses Secure Information)
- Task 43: Describe the cyberattack surface of various organizations (How Businesses Secure Information)
- Task 64: Distinguish among types of ethical concerns. (Privacy vs. Security)
- Task 73: Explain the concept of "personally identifiable information." (You are the Data)
- Task 74: Explain how and why personal data is valuable to both an individual and to the organizations. (You are the Data)
- Task 75: Identify ways to control and protect personal data. (You are the Data)
- Task 77: Analyze the social and legal significance of the ongoing collection of personal digital information. (Your Permanent Electronic Record)

The National Institute of Standards and Technology has published the [Glossary of Key Information Security Terms](#), which has been extracted from federal standards, publications, reports, and instructions.

The [SANS Institute](#) offers free professional development curricula focused on the fundamentals of cybersecurity. The course covers operating systems, networking, and systems administration.

[The Virginia Cyber Range](#) is a Commonwealth of Virginia initiative with a mission to enhance cybersecurity education for students in the Commonwealth's public high schools, colleges, and universities. The Virginia Cyber Range seeks to increase the number of fully prepared students entering the cybersecurity workforce in operations, development, and research. The Virginia Cyber Range provides an extensive Courseware Repository for educators and a cloud-hosted Exercise Area environment for hands-on cybersecurity labs and exercises for students.

[AFA CyberPatriot](#) is the National Youth Cyber Education Program created by the Air Force Association to inspire K-12 students toward careers in cybersecurity or other science, technology, engineering, and mathematics (STEM) disciplines critical to our nation's future. At the core of the program is the National Youth Cyber Defense Competition, the nation's largest cyber defense competition that puts high school and middle school students in charge of securing virtual networks.

## Net Etiquette

["What do I need to know about technology?"](#) Northern Virginia Community College

["Netiquette,"](#) Justice Institute of British Columbia

## Coding Standards

["SEI CERT Coding Standards,"](#) Software Engineering Institute, Carnegie-Mellon University

[Open Web Application Security Project \(OWASP\)](#), focused on improving the security of software.

## **Job-related Tools and Data**

[CyberSeek](#): Provides detailed data about supply and demand in cybersecurity fields, including an interactive state-by-state map which shows the field where demand is highest. For job seekers, educators, school counselors, and students.

[“Breaking the Code on a Career in Cybersecurity”](#): Virginia Space Grant Consortium’s free video series, which features interviews with cyber professionals about their career pathways.

# Appendix: Credentials, Course Sequences, and Career Cluster Information

## Industry Credentials: Only apply to 36-week courses

- A+ Certification Examination
- Business Information Processing Assessment
- Certified Associate in Python Programming (PCAP) Examination
- Certified Entry-Level Python Programmer (PCEP) Examination
- Certified Internet Web (CIW) Advanced HTML 5 and CSS 3 Specialist Examination
- Certified Internet Web (CIW) Data Analyst Examination
- Certified Internet Web (CIW) Database Design Specialist Examination
- Certified Internet Web (CIW) E-Commerce Services Specialist Examination
- Certified Internet Web (CIW) Internet Business Associate Examination
- Certified Internet Web (CIW) JavaScript Specialist Examination
- Certified Internet Web (CIW) Network Technology Associate Examination
- Certified Internet Web (CIW) Site Development Associate Examination
- Certified Internet Web (CIW) Social Media Strategist Examination
- Certified Internet Web (CIW) User Interface Designer Examination
- Certified Internet Web (CIW) Web Design Specialist Examination
- Certified Internet Web (CIW) Web Security Specialist Examination
- Cloud Essentials Certification Examination
- College and Work Readiness Assessment (CWRA+)
- Computer Maintenance Technology Examination
- Computer Networking Fundamentals Assessment
- Computer Repair Technology Assessment
- Computer Technology Assessment
- Cyber Forensics Associate Examination
- Ethical Hacking Associate Examination
- IC3 Digital Literacy Certification Examination
- Internetworking Examination
- IT Fundamentals+ Certification Examination
- Linux+ Certification Examination
- Microsoft 365 Fundamentals Examination
- Microsoft Certified Azure Fundamentals Examination
- Microsoft Dynamics 365 Fundamentals Examination
- Microsoft Office Specialist (MOS) Examinations
- Microsoft Technology Associate (MTA) Examinations
- National Career Readiness Certificate Assessment
- Network Administration Certification Tests
- Network Pro Certification Examination
- Network+ Certification Examination
- Oracle Certified Associate Examinations
- Oracle Certified Junior Associate Examinations
- PC Pro Certification Examination
- Security Pro Certification Examination
- Security+ Certification Examination
- Technical Support Certification Tests
- Workplace Readiness Skills for the Commonwealth Examination

**Concentration sequences:** *A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.*

- Computer Information Systems (6612/36 weeks)
- Computer Information Systems (6614/18 weeks)
- Computer Information Systems, Advanced (6613/36 weeks)
- Computer Information Systems, Advanced (6615/18 weeks)
- Computer Network Software Operations, Advanced (6651/36 weeks)
- Cybersecurity Fundamentals (6302/36 weeks)
- Cybersecurity Software Operations, Advanced (6306/36 weeks)
- Database Design and Management (Oracle) (6660/36 weeks)
- Design, Multimedia, and Web Technologies (6630/36 weeks)
- Design, Multimedia, and Web Technologies (6632/18 weeks)
- Digital Applications (6611/36 weeks)
- Digital Applications (6617/18 weeks)
- Information Technology Fundamentals (6670/36 weeks)
- International Baccalaureate Information Technology in a Global Society (IB6613/36 weeks)
- Java Programming (Oracle) (6661/36 weeks)
- Office Administration (6621/36 weeks)
- Office Administration (6622/18 weeks)
- Programming (6640/36 weeks)
- Programming, Advanced (6641/36 weeks)

<b>Career Cluster: Information Technology</b>	
<b>Pathway</b>	<b>Occupations</b>
<b>Information Support and Services</b>	<b>Computer Support Specialist Database Administrator Internet Entrepreneur Maintenance Technician</b>
<b>Network Systems</b>	<b>Computer and Information Systems Administrator Computer Support Specialist Network and Computer Systems Administrator Telecommunications Specialist</b>
<b>Programming and Software Development</b>	<b>Computer Software Engineer Programmer Software Applications Engineer Software Test Engineer Systems Analyst</b>

<b>Career Cluster: Science, Technology, Engineering and Mathematics</b>	
<b>Pathway</b>	<b>Occupations</b>
<b>Engineering and Technology</b>	<b>Computer Hardware Engineer Computer Programmer Computer Software Engineer</b>

<b>Career Cluster: Science, Technology, Engineering and Mathematics</b>	
<b>Pathway</b>	<b>Occupations</b>
	<b>Network and Computer Systems Administrator</b> <b>Network Systems and Data Communication Analyst</b> <b>Production, Planning, Expediting Clerk</b> <b>Project Manager</b> <b>Stockroom, Warehouse, or Storage Yard Stock Clerk</b> <b>Technical Writer</b> <b>Telecommunications Specialist</b> <b>Transportation Manager</b>