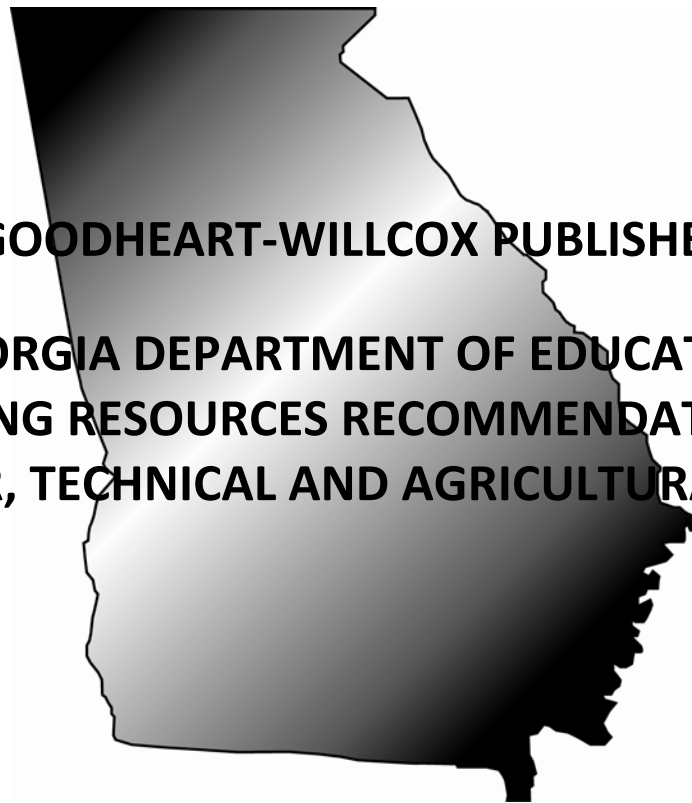




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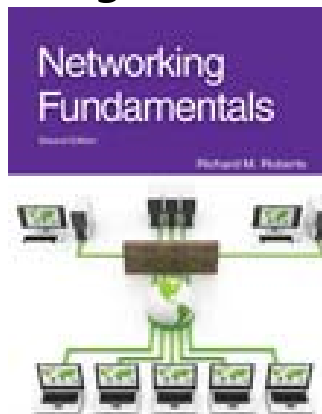
**GEORGIA DEPARTMENT OF EDUCATION
2011 LEARNING RESOURCES RECOMMENDATION PROCESS
GRADES 6-12 CAREER, TECHNICAL AND AGRICULTURAL EDUCATION (CTAE)**



INSTRUCTIONAL MATERIAL CORRELATION

Course: Networking Systems (11.42200)

Text: *Networking Fundamentals* ©2012



FORMAT FOR CORRELATION TO THE GEORGIA PERFORMANCE STANDARDS

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Publisher: Goodheart-Willcox Publisher

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| <u>Standard</u> (Cite Number) | <u>Standard</u> (Cite specific standard) | <u>Where Taught</u> (If print component, cite page number; if non-print, cite appropriate location.) |
|---|--|--|
| | INTRODUCTION TO NETWORKING | |
| BCS-NTS-1 | Students will explore local-area network (LAN), metropolitan area network (MAN), and wide-area (WAN) trends and issues including the basics of telecommunications and use in the interconnection of networks. | |
| a. | Explain the advantages and disadvantages of a network system. | 28–29 |
| b. | Identify the three major network classifications: LAN, MAN, and WAN. | 29 |
| c. | Identify the basic network topologies. | 30–36, 132–133 |
| d. | Compare and contrast a peer-to-peer network with a client/server network. | 37–39 |
| e. | Describe how data is packaged and transmitted. | 40 |
| f. | Explain the purpose of a protocol. | 41 |
| g. | List the common networking protocols. | 42–46 |
| h. | Explain the purpose of general network devices such as a hub, repeater, switch, and gateway. | 48–52 |
| i. | Identify the major standards organizations. | 52–55 |
| j. | Identify and explain the purpose of the IEEE 802 standards. | 53–54 |
| k. | List and explain the purpose of each OSI | 55–57 |

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| | | |
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| | layer. | |
| | NETWORK MEDIA – COPPER CORE, FIBER-OPTIC, WIRELESS | |
| BCS-NTS-2 | Students will demonstrate knowledge of LAN physical media and knowledge of network connectivity basics. | |
| a. | Match the five forms of electronic signals to the media types on which they travel. | 69 |
| b. | Describe the major differences between an analog and a digital signal. | 69–70 |
| c. | Describe the two methods of data transmission: Broadband and Baseband. | 73–75 |
| d. | Define simplex, half-duplex, and full-duplex communication. | 75 |
| e. | Define electronic terms such as impedance, reflected loss, and crosstalk. | 76–77 |
| BCS-NTS-3 | Students will demonstrate knowledge of the basics of Ethernet and Token Ring technology. | |
| a. | List the characteristics of the 802.3 classifications. | 88–95 |
| b. | List the characteristics of the 802.5 classifications. | 100–102 |
| c. | Describe the various types of wiring faults. | 102–105 |
| BCS-NTS-4 | Students will demonstrate knowledge of the basics of token bus, Fiber Distributed Data Interface (FDDI), and Wireless LAN technology. | |

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| a. | List the advantages of fiber-optic cable as compared to copper core cable. | 121–122 |
| b. | Explain the properties of light associated with fiber-optic cable. | 123–124 |
| c. | Describe the characteristics of fiber-optic cable transmission. | 125–128 |
| d. | Describe the difference between multimode and single-mode fiber-optic cable. | 128–129 |
| e. | List the characteristics and specifications of the IEEE 802.3 fiber-optic standards. | 129–132 |
| f. | List the characteristics and specifications of the FDDI standard. | 132–134 |
| g. | Describe the principles of radio wave transmission. | 149–151 |
| h. | Describe the three transmission techniques used in radio wave-based transmission. | 157–158 |
| i. | Identify the characteristics of the U-NII classifications. | 159–160 |
| j. | Identify the key characteristics of the IEEE 802.11 wireless networking standards. | 163–166 |
| k. | Describe the CSMA/CA access method. | 166–170 |
| l. | Identify the key characteristics of the Bluetooth standard. | 172–173 |
| m. | Explain how cellular technology works. | 173–174 |
| n. | Describe the two types of microwave networks. | 154-156 |
| o. | Describe the two types of infrared transmission. | 151–152 |

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| | p. | List the advantages and disadvantages of wireless networking. | 176 |
| | q. | Explain the purpose of the SSID. | 161–162 |
| | r. | Explain how security is provided in wireless networks. | 176–181 |
| | | NETWORK OPERATING SYSTEMS | |
| BCS-NTS-5 | | Students will demonstrate knowledge of the general characteristics of network operating systems and knowledge of common network computing platforms. | |
| | a. | Describe the common traits of all major network operating systems. | 239–242 |
| | b. | Describe the purpose of the data link layer of the OSI model. | 242–243 |
| | c. | Explain the principle of Ethernet communication. | 244–247 |
| | d. | Explain the principle of AppleTalk communication. | 250 |
| | e. | Explain the principle of Token Ring communication. | 247–249 |
| | f. | Explain the principle of Token Bus communication. | 249 |
| | g. | Explain the principle of ARCnet communication. | 249–250 |
| | h. | Describe the function of NetBIOS. | 254–256 |
| | i. | Describe the function of NetBEUI. | 256–257 |
| BCS-NTS-6 | | Students will demonstrate knowledge of network applications and knowledge of | |

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| | network operating systems (i.e., Windows NT, LINUX, Appletalk). Students will install basic system architectures using current windows operating system software and will perform network administration. | |
| a. | Identify the major differences between a Microsoft peer-to-peer network and a Microsoft client/server network. | 37–39, 273–274 |
| b. | Discuss the differences between FAT16, NTFS4.0, and NTFS5.0 | 286–287 |
| c. | Describe the Windows NT domain model. | 274, 281 |
| d. | Explain the Windows NT authentication process. | 282, 298–299 |
| e. | Describe the Windows 2000 Server and Windows Server 2003 Active Directory structure. | 293–298 |
| f. | Explain the Active Directory authentication process. | 298–299 |
| g. | Explain the purpose of the Microsoft Management Console (MMC). | 302 |
| h. | Explain how a domain user and group account is set up in Active Directory. | 282–283, 305–306 |
| i. | Explain the ways to obtain interoperability between clients and servers in networks with different network operating systems. | 310 |
| j. | Describe the major features in the UNIX/Linux operating system. | 324–333 |
| k. | Describe the file systems associated with | 334–335 |

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| | Linux. | |
| | l. Compare and contrast the file system structure of UNIX with other common file system structures. | 334–335 |
| | m. Define the file and directory permissions used with the Linux file system. | 336–338 |
| | n. Explain how UNIX/Linux can establish communications with a Microsoft operating system. | 344–346 |
| BCS-NTS-7 | Students will explore the standard computer network communication protocol TCP/IP and its importance to standards based networks. | |
| | a. Explain the differences between IPv4 and IPv6. | 426–427 |
| | b. Explain the purpose and operation of the Network Address Translation (NAT) protocol. | 408 |
| | c. Determine the IP address and subnet mask on a workstation. | 405–407 |
| | d. Explain the purpose and operation of the Domain Name System (DNS). | 410–411 |
| | e. Describe how UDP, TCP, and IP relate to the OSI model. | 416–417 |
| | f. Explain the purpose and operation of the Windows Internet Naming Service (WINS). | 416, 419–420 |
| | g. Explain the purpose and operation of the Dynamic Host Configuration Protocol (DHCP). | 420–422 |

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| | h. Identify an Automatic Private IP Addressing (APIPA) address. | 422–423 |
| | i. Interpret the displays of TCP/IP troubleshooting utilities. | 437–441 |
| | SUB-NETTING FUNDAMENTALS | |
| BCS-NTS-8 | Students will explore the concept of sub-netting and its importance to standards based networks. | |
| | a. Count using the binary number system. | 453 |
| | b. Calculate a specific subnet mask needed for a set of conditions. | 454–458 |
| | c. Identify subnet network characteristics by inspecting the subnet mask. | 454–455 |
| | d. Explain the purpose, advantages, and disadvantages of sub-netting. | 45, 459–460 |
| | e. Explain the characteristics and purpose of a Virtual LAN (VLAN). | 469–471 |
| | NETWORK SECURITY | |
| BCS-NTS-9 | Students will explore the concepts related to computer network and host based security. Students will design network security systems. | |
| | a. Identify common network security breaches and vulnerabilities. | 599–606 |
| | b. Explain the difference between symmetrical and asymmetrical encryption. | 607–608 |
| | c. Explain the role of a Certificate Authority (CA). | 608–609 |

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| | d. Explain the security process associated with the Challenge Handshake Access Protocol (CHAP). | 621–622 |
| | e. Describe the characteristics of a secure password. | 625 |
| | f. Describe how a firewall and proxy server are used to secure network access. | 627–631 |
| | g. Describe how to monitor network activities. | 633–637, 681–685 |
| | h. Design network security protocol system. | 610–613 |
| BCS-NTS-6 | Students will be able to differentiate processes, services, and protocols. Students will demonstrate knowledge of the Open Systems Interconnection (OSI) standard (ISO Standard 7498) and knowledge of communications standards for networks. | |
| | a. Compare the OSI model to the DoD/TCP/IP model. | 650–651 |
| | b. Describe the function of the IEEE logical link control (LLC) and the media access control (MAC) sublayers. | 652 |
| | c. Compare various network hardware to the OSI model. | 652–653 |
| | d. Explain the function of each layer of the OSI model. | 56–58, 654–661 |
| | e. Compare various IEEE standards to the OSI model. | 651–652 |
| | f. Describe the encapsulation process. | 661–662 |
| | g. Compare the TCP/IP protocol suite to the OSI | 663 |

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| | | |
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| | model. | |
| h. | Compare the IPX/SPX protocol suite to the OSI model. | 663–665 |
| i. | Compare the AppleTalk protocol suite to the OSI model. | 665–666 |
| | DESIGNING, INSTALLING, MAINTAINING, AND TROUBLESHOOTING COMPUTER NETWORKS | |
| BCS-NTS-11 | Students will demonstrate knowledge of design standards, analysis and section for networks. | |
| a. | Describe the factors to be considered when designing or modifying a network. | 783–787 |
| b. | Describe methods used for naming conventions. | 788–789 |
| c. | Explain the various stages of network design. | 794–796 |
| d. | Identify and explain terminology used by standards to identify network cable connection locations. | 797 |
| e. | Describe the various facilities used in a telecommunications infrastructure. | 799–800, 804 |
| BCS-NTS-12 | Students will demonstrate knowledge of installation procedures. | |
| a. | Explain the various stages of network design and installation. | 794–796 |
| b. | Identify and explain terminology used by standards to identify network cable | 797 |

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| | connection locations and addressing schemes. | |
| | c. Describe the various facilities used in a telecommunications infrastructure. | 799–800, 804 |
| BCS-NTS-13 | Students will demonstrate knowledge of computer network operation and management procedures including network maintenance and diagnostic testing. | |
| | a. Explain why a baseline is established. | 677 |
| | b. Describe how to perform a baseline. | 678–681 |
| | c. Explain the purpose and proper procedure for installing patches, upgrades, and service packs. | 686–687 |
| | d. Describe the commonly accepted practices for protecting data. | 691–696 |
| | e. Explain fault tolerance. | 691 |
| | f. Describe server data backup strategies. | 692–696 |
| | g. Explain the purpose of an Uninterruptible Power Supply (UPS). | 698–700 |
| | h. List commonly accepted antivirus procedures and policies. | 702–703 |
| BCS-NTS-14 | Students will demonstrate knowledge in troubleshooting network problems. | |
| | a. Explain the CompTIA troubleshooting strategies. | 721 |
| | b. Determine the best course of action to remedy a network problem. | 721–728 |
| | c. Describe in detail the boot sequence for Microsoft NT-based and Windows 98 | 731–734 |

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| | workstations. | |
| d. | Determine if the problem is user-, hardware-, or software-generated. | 746–753 |
| e. | List the most common network problems encountered. | 753–759 |
| f. | Describe how event logs are used to assist with troubleshooting the network. | 681--685 |
| g. | Describe common TCP/IP utilities and explain their use as applied to troubleshooting networks. | 760–770 |