Georgia CTAE

Networking Systems and Support (11.46200) (2021)

Adopted 2021

Demonstrate employability skills required by business and industry. IT-NSS-1

1. **Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.** IT-NSS-1.1
2. **Demonstrate creativity by asking challenging questions and applying innovative procedures and methods.** IT-NSS-1.2
3. **Exhibit critical thinking and problem-solving skills to locate, analyze and apply information in career planning and employment situations.** IT-NSS-1.3
4. **Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.** IT-NSS-1.4
5. **Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply team-work skills.** IT-NSS-1.5
6. **Present a professional image through appearance, behavior, and language.** IT-NSS-1.6

Identify the fundamental principles of networking demonstrating installation, configuration, optimization, upgrades of networking, and accurate recordkeeping. IT-NSS-2

1. **Identify tools used in network installation and configuration.** IT-NSS-2.1
2. **Use diagnostic procedures and troubleshooting techniques in solving network problems perform preventive maintenance on networks.** IT-NSS-2.2
3. **Describe the different types of common network cables and connectors by defining each as relating to speed and connection technology for the purpose of establishing connectivity.** IT-NSS-2.3
4. **Install and configure network cards for wired and wireless connection.** IT-NSS-2.4
5. **Demonstrate and explain the importance of accurate recordkeeping of installations, trouble tickets, upgrades, and other tasks.** IT-NSS-2.5

Explore local-area network (LAN),

1. **Explain the characteristics and differences between LAN, MAN, WAN, and WLAN.** IT-NSS-3.1

metropolitan area network (MAN), wide-area network (WAN), and wireless local-area network (WLAN) trends and issues including the basics of telecommunications and use in the interconnection of networks. IT-NSS-3	2. **Compare and contrast a peer-to-peer network with a client/server network.** IT-NSS-3.2 3. **Explain the common networking protocols.** IT-NSS-3.3 4. **Explain the how data is packaged and transmitted using protocols.** IT-NSS-3.4 5. **Explain the purpose of general network devices such as a hub, repeater, switch, and router.** IT-NSS-3.5 6. **Compare and Contrast the similarities and differences between each layer of the OSI Model and the TCP/IP Model when data is transmitted.** IT-NSS-3.6
Demonstrate knowledge of LAN physical media and knowledge of network connectivity basics. IT-NSS-4	1. **List the characteristics of the IEEE 802.3 (Ethernet), 802.5 (token right), 802.3 (fiber-optic), and 802.11 (wireless) standards.** IT-NSS-4.1 2. **Analyze each standard and determine which would be used in certain business network environments.** IT-NSS-4.2 3. **Explain the difference between different network media – Copper Core, Fiber-Optic, and Wireless.** IT-NSS-4.3 4. **Describe the major differences between an analog and digital signal.** IT-NSS-4.4 5. **Explain Broadband, Baseband, and telecommunication services during data transmission.** IT-NSS-4.5 6. **Define simplex, half-duplex, and full-duplex communication.** IT-NSS-4.6 7. **Configure a wireless network card and record all configuration properties.** IT-NSS-4.7
Understand through explanation and demonstration of the two standard computer network communication protocols (OSI Layer and TCP/IP) and its importance to standards-based networks. IT-NSS-5	1. **Compare and contrast the similarities and differences between each layer of the OSI model and the TCP/IP model when data is transmitted.** IT-NSS-5.1 2. **Explain difference between IPv4 and IPv6 network addresses.** IT-NSS-5.2 3. **Explain the network address translation process.** IT-NSS-5.3 4. **Explain public and private addressing.** IT-NSS-5.4 5. **Describe the characteristics of each protocol and its purpose in OSI Layer and the TCP/IP protocol stack.** IT-NSS-5.5 6. **Describe how UDP, TCP, and IP relate to the OSI model.** IT-NSS-5.6 7. **Interpret TCP/IP troubleshooting utilities.** IT-NSS-5.7 8. **Compare the IPX/SPX protocol suite to the OSI model.** IT-NSS-5.8

	9. **Compare the Apple Talk protocol suite to the OSI model.** IT-NSS-5.9
Demonstrate the concept of sub-netting and the importance to standards-based networks. IT-NSS-6	1. **Demonstrate how to access TCP/IP properties for all major operating systems.** IT-NSS-6.1 2. **Understand how to Identify the different class of networks of an IPv4 IP address.** IT-NSS-6.2 3. **Demonstrate conversion methods of binary, decimal, and hexadecimal.** IT-NSS-6.3 4. **Calculate VLSM (Various Length Subnet Masks) needed for network administration.** IT-NSS-6.4 5. **Explain the purpose, advantages and disadvantages of sub-netting and super-netting.** IT-NSS-6.5 6. **Understand the characteristics and purpose of a Virtual LAN (VLAN).** IT-NSS-6.6
Identify the fundamental principles of network security systems for optimal network operation and administration. IT-NSS-7	1. **Identify common network ports used for security breaches and vulnerabilities.** IT-NSS-7.1 2. **Compare and contrast symmetrical and asymmetrical encryption.** IT-NSS-7.2 3. **Explain the importance of user authentication (passwords) and certificate authority.** IT-NSS-7.3 4. **Demonstrate security processes associated with Challenge Handshake Access Protocol (CHAP).** IT-NSS-7.4 5. **Describe how firewall and proxy servers are used to secure network access.** IT-NSS-7.5 6. **Explain various monitoring protocol tools to secure network traffic.** IT-NSS-7.6 7. **Understand router security issues.** IT-NSS-7.7
Troubleshoot network problems and functions. IT-NSS-8	1. **Identify ways to research online and locate troubleshooting techniques.** IT-NSS-8.1 2. **Explain industry certified troubleshooting strategies (CompTia, Cisco, etc.).** IT-NSS-8.2 3. **Perform Network Address Translation configuration and troubleshooting.** IT-NSS-8.3 4. **Explain network documentation.** IT-NSS-8.4

	5. Describe how event logs are used to assist with troubleshooting network issues IT-NSS-8.5
	6. Explain troubleshooting methodologies and tools. IT-NSS-8.6
	7. Perform network troubleshooting by layer. IT-NSS-8.7
Create a network using design standards, analysis, and section for networks. IT-NSS-9	1. Describe the factors to be considered when designing or modifying a network. IT-NSS-9.1
	2. Describe methods used for naming conventions. IT-NSS-9.2
	3. Explain the various stages of network design. IT-NSS-9.3
	4. Identify and explain terminology used by standards to identify network cable connection locations. IT-NSS-9.4
	5. Describe the various facilities used in a telecommunications infrastructure. IT-NSS-9.5
Explain computer network operation and management procedures including network maintenance and diagnostic testing. IT-NSS-10	1. Explain why and how a baseline is established. IT-NSS-10.1
	2. Describe the commonly accepted practices for protecting data. IT-NSS-10.2
	3. Describe the use of fault tolerance and different data backup strategies. IT-NSS-10.3
	4. Explain proper procedures for installing patches, upgrades, and service packs. IT-NSS-10.4
	5. List commonly accepted antivirus procedures and policies. IT-NSS-10.5
Apply network applications and knowledge of network operating systems by installing basic system architectures using current windows operating system software and perform network administration. IT-NSS-11	1. Explain the Windows authentication process. IT-NSS-11.1
	2. Explain the Active Directory authentication process. IT-NSS-11.2
	3. Explain the ways to obtain interoperability between clients and servers in networks with different network operating systems. IT-NSS-11.3
	4. Compare and contrast the different file systems (FAT16, FAT32, and NTSF). IT-NSS-11.4
	5. Demonstrate knowledge of network applications and architecture protocols. IT-NSS-11.5
Organize personal online career portfolio for specific career interests. IT-NSS-12	1. Review and update résumé to reflect new knowledge and skills master and additional work experience. IT-NSS-12.1

2. **Organize folders within the portfolio to reflect specific careers of interest, including résumé, targeted cover letter, and artifacts relevant to the specific career.** IT-NSS-12.2
3. **Update all current items in the portfolio.** IT-NSS-12.3
4. **Identify and upload additional industry-appropriate artifacts reflective of mastered skills throughout this course. Write and include a reflective entry for each artifact discussing steps taken, problems encountered and how they were overcome, and other pertinent information about the learning.** IT-NSS-12.4
5. **Polish all entries in the online career portfolio to ensure accuracy and professionalism as expected from employers.** IT-NSS-12.5
6. **Conduct a job search and share the appropriate folder with the potential employer.** IT-NSS-12.6

Explore how related student organizations are integral parts of career and technology education courses through leadership development, school and community service projects, entrepreneurship development, and competitive events. IT-NSS-13

1. **Explain the goals, mission, and objectives of Future Business Leaders of America (FBLA) and/or Technology Student Association (TSA) and/or SkillsUSA.** IT-NSS-13.1
2. **Explore the impact and opportunities a student organization (FBLA, TSA, SkillsUSA) can develop to bring business and education together in a positive working relationship through innovative leadership and career development programs.** IT-NSS-13.2
3. **Explore the local, state, and national opportunities available to students through participation in related student organizations (FBLA, TSA, SkillsUSA) including but not limited to conferences, competitions, community service, philanthropy, and other student organization activities.** IT-NSS-13.3
4. **Explain how participation in career and technology education student organizations can promote lifelong responsibility for community service and professional development.** IT-NSS-13.4
5. **Explore the competitive events related to the content of this course and the required competencies, skills, and knowledge for each related event for individual, team, and chapter competitions.** IT-NSS-13.5