NETWORK TECHNOLOGIES, 15.1200.30

1.0 APPLY PROBLEM-SOLVING AND CRITICAL THINKING SKILLS APPLICABLE TO NETWORK TECHNOLOGY	
1.1	Describe methods to determine priorities in establishing and maintaining a computer network
1.2	Prepare a plan of work and schedule information technology tasks
1.3	Apply problem-solving processes, i.e., bottom-up, top-down, and divide-and-conquer
1.4	Locate, identify, and resolve a physical network topology problem
1.5	Identify and describe the sequential steps in troubleshooting a network problem
1.6	Describe the sequential steps needed to identify and resolve a wiring or infrastructure problem
2.0 MAINTAIN A SAFE AND ENVIRONMENTALLY CONSCIOUS INFORMATION TECHNOLOGY WORK ENVIRONMENT	
2.1	Demonstrate personal responsibility for developing and maintaining a safe and healthy information technology work environment
2.2	Use tools, materials, and equipment commonly utilized in the field of information technology safely
2.3	Identify ergonomics and repetitive strain injuries common to information technology occupations
2.4	Determine safe working practices to avoid or eliminate physical and electrical hazards
2.5	Identify techniques used to manage power consumption in the networked environment
2.6	Explain environmental considerations when disposing of computer/networking components
2.7	Describe and resolve the most common electrostatic discharge (ESD) hazards in a network environment
3.0 RECOGNIZE SECURITY ISSUES RELATED TO NETWORK TECHNOLOGY	
3.1	Explain policies to maintain data integrity and security
3.2	Identify security issues related to the network, computer hardware, software, and data
3.3	Explain the importance of physical security of computer hardware
3.4	Describe computer threats and methods to protect a computer (i.e., viruses, phishing, e-mail, social engineering, spoofing, identify theft, and spamming
3.5	Explain concepts such as denial of service, hacking/cracking, intrusion, detection, and prevention
4.0 EXPLORE LEGAL AND ETHICAL ISSUES RELATED TO INFORMATION TECHNOLOGY	
4.1	Explore issues regarding intellectual property rights including software licensing and software duplication

4.2	Understand the difference between open source, freeware, and proprietary systems in relation to legal and ethical issues
4.3	Identify issues and trends affecting computers and information privacy
4.4	Differentiate between ethical and legal uses of information technology, (e.g., data pricing, use of public and private networks, social networking, industry-related data, and data piracy)
5.0 DEMONSTRATE BASIC COMPUTER MATHEMATICS REQUIRED FOR INFORMATION TECHNOLOGY	
5.1	Explain the function of base number systems in mathematics as they relate to computer technology
5.2	Perform decimal to binary and binary to decimal conversions
5.3	Perform decimal to hexadecimal and hexadecimal to decimal conversions
5.4	Perform hexadecimal to binary and binary to hexadecimal conversions
5.5	Determine appropriate method to perform conversions, e.g., paper/pencil, electronic resources
5.6	Apply basic Boolean logic (e.g., “and”, “or”, “not”, “nor”)
6.0 DESCRIBE THE DEVELOPMENT/EVOLUTION OF COMPUTERS AND NETWORK TECHNOLOGY	
6.1	Describe a computer, its components and functions
6.2	Explain the historical evolution of the computer and computer networks
6.3	Explain how the development of computers has impacted modern life
6.4	Identify the structure and components of an information system, such as servers, network devices, system software, and applications
6.5	Discuss future trends in network technology
7.0 DEMONSTRATE KNOWLEDGE OF NETWORK TOPOLOGIES	
7.1	Compare and contrast proper logical and physical network topology
7.2	Specify the main features and characteristics of various networking topologies (e.g., ring, star, bus, and mesh
8.0 DEMONSTRATE KNOWLEDGE OF NETWORK MEDIA	
8.1	Specify the characteristics of speed, length, topology, and cable type of typical network types
8.2	Identify appropriate media connectors for various networks
8.3	Identify appropriate media types and uses
8.4	Understand the purpose, features, and functions of various network components

8.5	Specify the general characteristics of speed, frequency, topology, and transmission type of various wireless technologies (metropolitan, local, and short distance)
8.6	Identify factors that affect the speed and range of various wireless technologies
9.0 DEFINE NETWORK PROTOCOLS AND STANDARDS	
9.1	Describe the parts and functions of a Media Access Control (MAC) address
9.2	Describe the name, function, and characteristics of the seven layers of the Open Systems Interconnect (OSI) model
9.3	Describe the name, function, and characteristics of the four layers of the TCP/IP model
9.4	Explain the purpose of static and dynamic routing protocols
9.5	Construct a static route
9.6	Construct a dynamic route
9.7	Define the purpose of well-known protocols (e.g., HTTP, FTP, SMTP, DNS, DHCP, and POP)
9.8	Describe the difference between well-known dynamic and ephemeral ports
9.9	Describe the characteristics of TCP and UDP
9.10	Define stateful and stateless protocols
9.11	Categorize IPv4/IPv6 addresses and their corresponding subnet masks
9.12	Identify the three port ranges used in networking services and protocols, i.e., system (0-1023), user (1024-49151), and dynamic/private (49152-65535)
9.13	Summarize the basic characteristics and protocols of WAN and MAN technologies, i.e., frame relay, ATM, and MPLS
9.14	Describe remote access protocols and services
9.15	Describe the purpose and function of security protocols, such as VPN, HTTPS, and tunneling
10.0 INSTALL A BASIC NETWORK OPERATING SYSTEM	
10.1	Describe the essential capabilities of Server Operating Systems (SOS)
10.2	Define client support, interoperability, authentication, file and print services, application support, and security
10.3	Configure network cards and network settings
10.4	Identify the appropriate tools to use for network repair or diagnostic tasks
10.5	Configure a client-to-server network connection for Unix/Linux and Windows

10.6	Describe the purpose, benefits, and disadvantages of using a firewall
10.7	Describe the purpose, benefits, and disadvantages of using a proxy service
10.8	Differentiate the various network security implementation strategies, i.e., blocking port numbers, encryption, and antivirus solution
10.9	Describe the purpose and characteristics of Virtual Local Area Networks (VLAN), extranets, and intranets
10.10	Describe the purpose of the components needed to build fault tolerance into a network
10.11	Describe the purpose of a disaster recovery plan for a network
10.12	Explain the importance of proper documentation in accordance with industry standards
10.13	Explain the importance of proper labeling in accordance with industry standards
11.0 PERFORM NETWORK MAINTENANCE	
11.1	Use the appropriate network utility to troubleshoot various connectivity issues
11.2	Demonstrate the use of visual indicators and diagnostic utilities to interpret problems
11.3	Troubleshoot and resolve small office/home network failures
11.4	Configure TCP/IP utility with host communicating in a LAN and on the internet
11.5	Identify connectivity issues in various server environments, such as Unix/Linux, and Windows
11.6	Identify and resolve network configuration issues resulting from incorrect protocols and misconfigurations
11.7	Identify common tools and methods of monitoring a network