

Florida Department of Education  
CURRICULUM FRAMEWORK

Program Title: Network Systems Administration  
 Program Type: Job Preparatory  
 Occupational Area: Business Technology Education  
 Components: Seven Occupational Completion Points Including Core

	<u>Secondary</u>	<u>PSAV</u>
Program Number:	8207440	B079300
CIP Number:	0507030405	
Grade Level:	9-12, 30, 31	30, 31
Standard Length:	7 credits	1050 hours
Certification:	BUS ED @4 1 @2 VOE @7 TEACH CBE @7 TEC ELEC \$7 G BUS DP @7 G ELECT DP @7 G BOOKKEEPIN @4 7 G CLERICAL @7 G SECRETAR @7 G COMP SCI @6 @2	BUS ED @4 1 @2 VOE @7 TEACH CBE @7 TEC ELEC \$7 G BUS DP @7 G ELECT DP @7 G BOOKKEEPIN @4 @7 G CLERICAL @7 G SECRETAR @7 G COMP SCI @6 @2
	Any academic certification + any appropriate industry certification Any district vocational certification + any appropriate industry certification	Any academic certification + any appropriate industry certification Any district vocational certification + any appropriate industry certification
CSO:	FBLA BPA	Phi Beta Lambda BPA
Coop Method:	Yes	Yes
Apprenticeship:	No	No
Facility Code:	212	212
Basic Skills:		
Math		9
Language		9
Reading		9
SOC Code:	15-1081	

I. **PURPOSE:** This program is designed to prepare students for employment as a Information Technology Assistant, Computer Support Assistant, Network Support Technician, Systems Administrator, Systems Engineer, Wireless Network Administrator, and Data Communications Analyst.

This program offers a broad foundation of knowledge and skills to prepare students for employment in network support services positions. The content includes instruction in computer literacy; software application support; basic hardware configuration and troubleshooting; networking technologies, troubleshooting, security, and administration; and customer service and human relations skills.

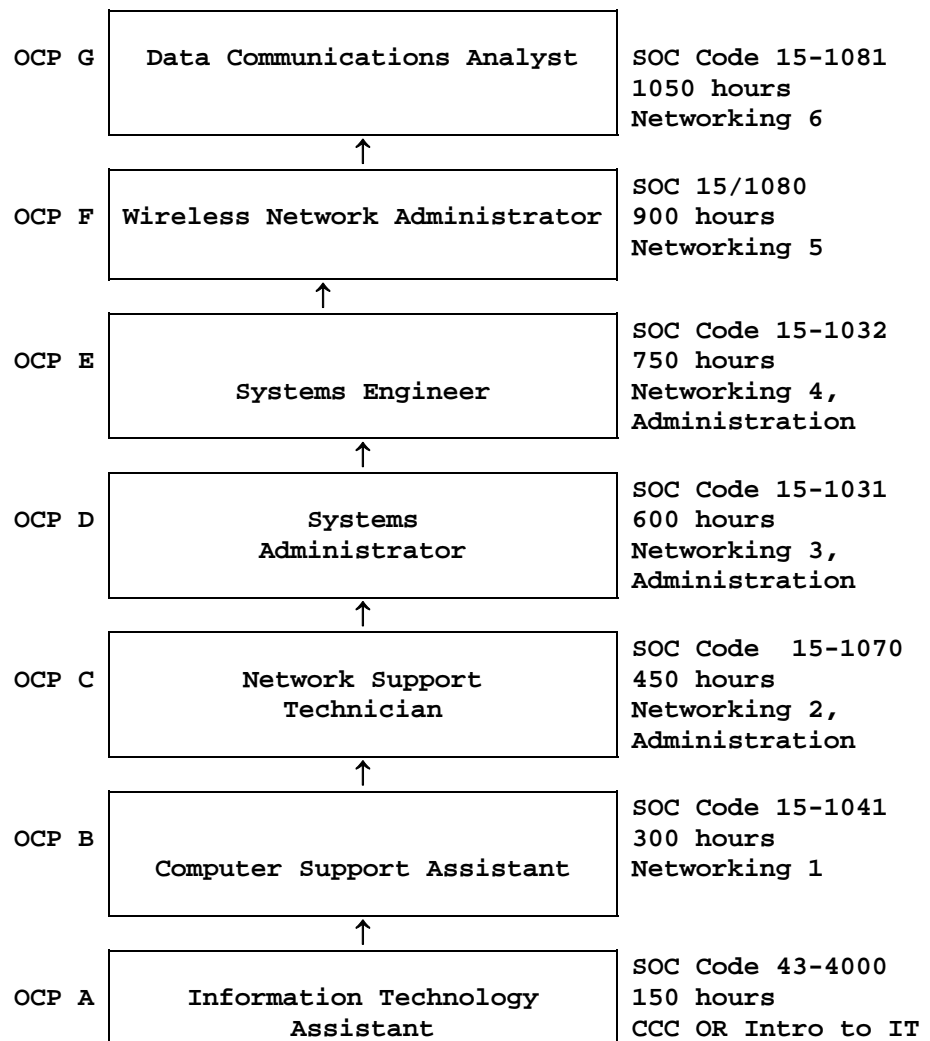
This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the

network support services industry: planning; management; finance; technical and production skills; underlying principles of technology; labor issues; community issues; and health, safety, and environmental issues.

- II. **PROGRAM STRUCTURE:** This program is a planned sequence of instruction consisting of the Business Information Technology Education Core (Information Technology Assistant - OCP A) and six additional occupational completion points. Secondary or postsecondary students who have previously completed the Business Information Technology Education Core will not have to repeat the core. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

The following diagram illustrates the Network Systems Administration program structure

**Computer Technology Cluster  
Secondary and Postsecondary Adult Vocational**



When offered at the secondary level, this program consists of the following courses which include the Business Information Technology Education Core:

- Core: 8209020 - Computing for College and Careers OR**  
**8207310 - Introduction to Information Technology**
- 8207020 - Networking 1  
8207441 - Networking 2, Administration  
8207442 - Networking 3, Administration  
8207443 - Networking 4, Administration  
8207060 - Networking 5  
8207070 - Networking 6

**III. LABORATORY ACTIVITIES:** Laboratory activities are an integral part of this program and include the use of keyboarding systems, computers, file servers, network transmission media, network cards, and other peripheral devices. Students will also work with operating systems, network operating systems, and applications software.

**IV. SPECIAL NOTES:** Future Business Leaders of America (Secondary), Phi Beta Lambda (Postsecondary), and Business Professionals of America are the appropriate Career Student Organizations (CSO) for providing leadership training and for reinforcing specific career and technical skills. Career Student Organizations, when provided, shall be an integral part of the career and technical instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, FAC.

Cooperative training - OJT is appropriate for this program. Whenever cooperative training - OJT is offered, the following are required for each student: a training plan, signed by the student, teacher, and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a workstation that reflects equipment, skills, and tasks that are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Rule 6A-10.040, FAC., the minimum basic skills grade levels required for postsecondary adult vocational students is: Mathematics 9.0, Language 9.0, Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Adult students with disabilities must self-identify and request such services. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

The standard length of this program is 1050 hours.

To be transferable statewide between institutions, this program must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

The particular outcomes and student performance standards which the handicapped student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

**Soft Skills/Employability Skills:** Industry representatives have recommended that the following basic/required soft skills be incorporated in the instructional strategies for this program—active listening; industry knowledge; behavior flexibility; decision making; oral communication and presentation; organizing and planning; problem solving; written communication; teamwork; interviewing/employability skills.

**SCANS Competencies:** Instructional strategies for this program must include methods that require students to identify, organize, and use resources appropriately; to work with each other cooperatively and productively; to acquire and use information; to understand social, organizational, and technological systems; and to work with a variety of tools and equipment. Instructional strategies must also incorporate the methods to improve students' personal qualities and high-order thinking skills.

**21<sup>st</sup>-Century Skills:** Instructional strategies for this program must include methods that require students to acquire 1. Digital-Age Literacy - basic scientific, mathematical, and technological literacies - visual and information literacies - cultural literacy and global awareness; 2. Inventive Thinking - adaptability/ability to manage complexity - curiosity, creativity, and risk taking - higher order thinking and sound reasoning; 3. Effective Communication - teaming, collaboration, and interpersonal skills - personal and social responsibility - interactive communication; 4. High Productivity - ability to prioritize, plan, and manage for results - effective use of real-world tools - relevant, high-quality products.

**Equipment List:** A generic equipment list is available for this program.

- V. **DISTANCE LEARNING:** Effective distance learning in Information Technology programs is difficult to accomplish due to the need for student participation in skills activities as part of the curriculum. Complete programs can be offered successfully for those students in which time is the restricting factor. This is accomplished through the use of distance learning materials for concept/theory mastery and skills labs that allow the student to complete the skills objectives of the curriculum across a variety of schedules.

VI. INTENDED OUTCOME: After completing the following competencies, the student will be able to:

**OCCUPATIONAL COMPLETION POINT - DATA CODE A**  
**INFORMATION TECHNOLOGY ASSISTANT - SOC Code 43-4000**

After completing the following competencies, the student will have achieved the occupational completion point of Information Technology Assistant and the student will be able to:

Computing for College and Careers competencies:

- 01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 01.01, 01.02, 01.03, 01.04, 01.05, 01.06, 01.07, 01.08.]
- 02.0 Demonstrate comprehension and communication skills. [Student Performance Standards: 02.01, 02.02, 02.04, 02.05, 02.05, 02.06, 02.07.]
- 03.0 Use technology to apply and enhance communication skills in technical reading, writing. [Student Performance Standards: 03.01, 03.02, 03.03, 03.05, 03.06.]
- 04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member. [Student Performance Standards: 04.01, 04.02, 04.03.]
- 05.0 Practice quality performance in the learning environment and the workplace. [Student Performance Standards: 05.01, 05.02.]
- 06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal and professional ethics to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 06.01, 06.02, 06.03.]
- 07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 07.01, 07.02, 07.03.]
- 08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. [Student Performance Standards: 08.01, 08.02, 08.03.]
- 09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. [Student Performance Standards: 09.01, 09.02, 09.03, 09.04, 09.05, 09.06, 09.07, 09.08.]
- 10.0 Demonstrate personal and interpersonal skills and attributes appropriate for the workplace. [Student Performance Standards: [10.01, 10.02, 10.03.]
- 13.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 13.02.]

- 41.0 Perform e-mail activities. [Student Performance Standards: 41.01, 41.09.]
- 42.0 Demonstrate operating systems. [Student Performance Standards: 42.01, 42.10, 42.12, 42.14.]
- 67.0 Develop an awareness of emerging technologies. [Student Performance Standards: 67.01, 67.02, 67.03.]

OR

**Introduction to IT Competencies:**

- 01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 01.01, 01.02, 01.03, 01.04, 01.06, 01.07.]
- 02.0 Demonstrate Comprehension and communication skills. [Student Performance Standards: 02.03, 02.62, 02.63, 02.64, 02.65, 02.66.]
- 03.0 Use technology to enhance the effectiveness of communication skills. [Student Performance Standards: 03.03, 03.06.]
- 04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. [Student Performance Standards: 04.01, 04.02.]
- 05.0 Practice quality performance in the learning environment and the workplace. [Student Performance Standards: 05.01, 05.02.]
- 06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 06.03.]
- 07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 07.01, 07.02, 07.03.]
- 08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. [Student Performance Standards: 08.02, 08.03.]
- 09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. [Student Performance Standards: 09.15, 09.16, 09.17, 09.18, 09.19, 09.20.]
- 10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. [Student Performance Standards: 10.01, 10.03.]
- 20.0 Participate in work-based learning experiences. [Student Performance Standards: 20.44, 20.46.]
- 41.0 Perform e-mail activities. [Student Performance Standards: 41.01, 41.02, 41.03, 41.04, 41.05, 41.06, 41.07, 41.08, 41.09, 41.10, 41.11, 41.12, 41.13.]
- 42.0 Demonstrate knowledge of different operating systems. [Student Performance Standards: 42.01, 42.10, 42.12, 42.14.]
- 55.0 Demonstrate proficiency navigating the internet, intranet, and the WWW. [Student Performance Standards: 55.01, 55.10, 55.11, 55.14, 55.15, 55.16, 55.17, 55.18.]

- 56.0 Demonstrate proficiency using HTML commands. [Student Performance Standards: 56.01, 56.02, 56.03, 56.04, 56.05, 56.06, 56.08, 56.17, 56.18, 56.19.]
- 57.0 Demonstrate proficiency in page design applicable to the WWW. [Student Performance Standards: 57.01, 57.02, 57.04, 57.05, 57.25, 57.26, 57.27.]
- 63.0 Demonstrate proficiency using specialized web design software. [Student Performance Standards: 63.01, 63.02.]
- 64.0 Develop an awareness of the information technology industry. [Student Performance Standards: 64.01, 64.04, 64.05.]
- 65.0 Develop an awareness of microprocessors and digital computers. [Student Performance Standards: 65.01, 65.02, 65.03, 65.04, 65.05, 65.06, 65.07, 65.08.]
- 66.0 Develop an awareness of programming languages. [Student Performance Standards: 66.01, 66.02, 66.03, 66.04.]
- 67.0 Develop an awareness of emerging technologies. [Student Performance Standards: 67.01, 67.02, 67.03.]
- 69.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model. [Student Performance Standards: 69.01, 69.02, 69.04, 69.06, 69.07, 69.08, 69.09, 69.11.]
- 70.0 Demonstrate proficiency using common software applications. [Student Performance Standards: 70.01, 70.02.]
- 71.0 Demonstrate proficiency using specialized software applications. [Student Performance Standards: 71.01, 71.02, 71.06.]

**OCCUPATIONAL COMPLETION POINT - DATA CODE B**  
**COMPUTER SUPPORT ASSISTANT - SOC Code 15-1041**

Intended outcomes of OCP A must be completed previously or concurrently. After completing the following additional competencies, the student will have achieved the occupational completion point of Computer Support Assistant and the student will be able to:

- 08.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. [Student Performance Standard: 08.17.]
- 30.0 Identify, install, configure, and upgrade desktop and server computer modules and peripherals, following established basic procedures for system assembly and disassembly of field replaceable modules. [Student Performance Standards: 30.01, 30.02, 30.03, 30.04, 30.05, 30.06, 30.07, 30.08, 30.09, 30.10, 30.11, 30.12, 30.13, 30.14, 30.15]
- 31.0 Diagnose and troubleshoot common module problems and system malfunctions of computer software, hardware, peripherals, and other office equipment. [Student Performance Standards: 31.01, 31.02, 31.03, 31.04, 31.05, 31.06, 31.07, 31.08, 31.09]
- 32.0 Identify issues, procedures and devices for protection within the computing environment, including people, hardware and the surrounding workspace. [Student Performance Standards: 32.01, 32.02, 32.03, 32.04, 32.05]
- 33.0 Identify specific terminology, facts, ways and means of dealing with classifications, categories and principles of motherboards, processors and memory in desktop and server computer systems. [Student Performance Standards: 33.01, 33.02, 33.03]

- 34.0 Demonstrate knowledge of basic types of printers, basic concepts, printer components, how they work, how they print onto a page, paper path, care and service techniques, and common problems. [Student Performance Standards: 34.01, 34.02, 34.03]
- 35.0 Identify and describe basic network concepts and terminology, ability to determine whether a computer is networked, knowledge of procedures for swapping and configuring network interface cards, and knowledge of the ramifications of repairs when a computer is networked. [Student Performance Standards: 35.01, 35.02, 35.03, 35.04, 35.05, 35.06, 35.07, 35.08, 35.09, 35.10, 35.11, 35.12, 35.13, 35.14, 35.15, 35.16, 35.17, 35.18]
- 36.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, internet, remote access, or direct contact. [Student Performance Standards: 36.01, 36.02, 36.03]
- 38.0 Demonstrate proficiency using graphical user interface (GUI) operating systems. [Student Performance Standards: 38.01, 38.02, 38.03, 38.04, 38.05, 38.06, 38.07, 38.08, 38.09, 38.10]

**OCCUPATIONAL COMPLETION POINT - DATA CODE C**  
**NETWORK SUPPORT TECHNICIAN SOC Code 15-1070**

Intended outcomes of OCP A and OCP B must be completed previously. After completing the following additional competencies, the student will have achieved the occupational completion point of Network Support Technician and the student will be able to:

- 08.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 08.18]
- 20.0 Participate in work-based learning experiences. [Student Performance Standards: 20.29, 20.30]
- 37.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, remote access, or direct contact. [Student Performance Standards: 37.09]
- 40.0 Perform installation and configuration activities. [Student Performance Standards: 40.01, 40.02, 40.03, 40.04, 40.05, 40.06, 40.07, 40.08, 40.09, 40.10]
- 41.0 Demonstrate proficiency using computer networks. [Student Performance Standards: 41.01]
- 42.0 Demonstrate proficiency in configuring and troubleshooting hardware devices and drivers. [Student Performance Standards: 42.01, 42.02, 42.03, 42.04]
- 43.0 Demonstrate proficiency in managing, monitoring, and optimizing system performance, reliability and availability. [Student Performance Standards: 43.01, 43.02, 43.03, 43.04, 43.05]
- 44.01 Demonstrate proficiency in managing, configuring and troubleshooting storage use. [Student Performance Standards: 44.01, 44.02, 44.03, 44.04, 44.05]
- 45.0 Demonstrate proficiency in configuring and troubleshooting network connections. [Student Performance Standards: 45.01, 45.02, 45.03, 45.04, 45.05, 45.06, 45.07, 45.08]
- 46.01 Demonstrate proficiency in implementing, monitoring, and troubleshooting security. [Student Performance Standards: 46.01, 46.02, 46.03, 46.04, 46.05, 46.06]

**OCCUPATIONAL COMPLETION POINT - DATA CODE D**  
**SYSTEMS ADMINISTRATOR SOC Code - 15-1031**

Intended outcomes of OCP A, OCP B, and OCP C must be completed previously. After completing the following additional competencies, the student will have achieved the occupational completion point of Systems Administrator and the student will be able to:

- 08.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 08.18]
- 20.0 Participate in work-based learning experiences. [Student Performance Standards: 20.29, 20.30, 20.32]
- 50.0 Administer accounts and resources on computers running server operating system software in a networked environment. [Student Performance Standards: 50.01, 50.02, 50.03, 50.04, 50.05, 50.06]
- 51.0 Modify user and computer accounts on computers running a server operating system in a networked environment. [Student Performance Standards: 51.01, 51.02, 51.03, 51.04, 51.05, 51.06, 51.07]
- 52.0 Perform various administrative functions using groups. [Student Performance Standards: 52.01, 52.02, 52.03, 52.04, 52.05]
- 53.0 Enable resource access with permissions, manage access to files and folders using permissions, and manage permission inheritance. [Student Performance Standards: 53.01, 53.02, 53.03, 53.04, 53.05]
- 54.0 Implement printing in a networked environment utilizing a particular server operating system. [Student Performance Standards: 54.01, 54.02, 54.03, 54.04]
- 55.0 Set up a network-wide printing strategy to meet the needs of users and troubleshoot installation or configuration problems. [Student Performance Standards: 55.01, 55.02, 55.03, 55.04]
- 56.0 Utilize available permissions for managing access to global directory objects, how to move objects between organizational units in the same domain, and how to delegate control of an organizational unit. [Student Performance Standards: 56.01, 56.02, 56.03]
- 57.0 Use group policy to configure folder redirection, browser connectivity, and the desktop. [Student Performance Standards: 57.01, 57.02, 57.03]
- 58.0 Manage computer security in a networking environment. [Student Performance Standards: 58.01, 58.02, 58.03, 58.04, 58.05]
- 59.0 Administer servers remotely. [Student Performance Standards: 59.01, 59.02, 59.03]
- 60.0 Monitor server performance by using performance tools, configure and manage performance logs, configure and manage alerts, and manage system monitor views. [Student Performance Standards: 60.01, 60.02, 60.03, 60.04]
- 61.0 Collect performance data by monitoring primary server subsystems and identify system bottlenecks by using the performance monitoring software. [Student Performance Standards: 61.01, 61.02, 61.03, 61.04, 61.05, 61.06, 61.07]
- 62.0 Maintaining device drivers. [Student Performance Standards: 62.01, 62.02]

- 63.0 Use software tools to manage and set up disks. [Student Performance Standards: 63.01, 63.02, 63.03, 63.04, 63.05, 63.06]
- 64.0 Use file encryption for security of data. [Student Performance Standards: 64.01, 64.02, 64.03]
- 65.0 Plan for a computer disaster and use the features of a server operating system to prevent a disaster or recover when one occurs. [Student Performance Standards: 65.01, 65.02, 65.03, 65.04, 65.05, 65.06, 65.07]
- 66.0 Manage and distribute critical software updates that resolve known security vulnerabilities and other stability issues. [Student Performance Standards: 66.01, 66.02, 66.03]
- 67.0 Construct and assign IP addresses and isolate addressing issues associated with the IP routing process. [Student Performance Standards: 67.01, 67.02, 67.03, 67.04]
- 68.0 Configure an internet protocol (IP) address for client computers. [Student Performance Standards: 68.01, 68.02, 68.03]
- 69.0 Configure name resolution mechanisms for clients on a network and describe the name resolution process. [Student Performance Standards: 69.01, 69.02, 69.03, 69.04]
- 70.0 Isolate common connectivity issues and describe how to use utilities and tools as part of this process. [Student Performance Standards: 70.01, 70.02, 70.03]
- 71.0 Configure a routing solution for a network environment. [Student Performance Standards: 71.01, 71.02, 71.03]
- 72.0 Allocate IP addressing in a network environment. [Student Performance Standards: 72.01, 72.02, 72.03, 72.04, 72.05, 72.06]
- 73.0 Manage the DHCP service to reflect changing client IP addressing needs and monitor DHCP server performance. [Student Performance Standards: 73.01, 73.02, 73.03]
- 74.0 Assign computer names to the IP addresses of the source and destination hosts, and then use the computer name to contact the hosts. [Student Performance Standards: 74.01, 74.02, 74.03]
- 75.0 Resolve host names by using domain name system. [Student Performance Standards: 75.01, 75.02, 75.03, 75.04, 75.05, 75.06, 75.07, 75.08]
- 76.0 Manage and monitor DNS servers to ensure that they are functioning properly and to optimize network performance. [Student Performance Standards: 76.01, 76.02, 76.03, 76.04, 76.05]
- 77.0 Configure a server with the routing and remote access service, create appropriate remote access connections on a network access server, and configure users' access rights. [Student Performance Standards: 77.01, 77.02, 77.03, 77.04, 77.05, 77.06]
- 78.0 Manage and monitor network access and the network access services. [Student Performance Standards: 78.01, 78.02]
- 79.0 Perform installation of a network client operating system. [Student Performance Standards: 79.01, 79.02, 79.03, 79.04]
- 80.0 Install and configure hardware devices. [Student Performance Standards: 80.01, 80.02, 80.03]
- 81.0 Configure and manage file systems. [Student Performance Standards: 81.01, 81.02, 81.03, 81.04, 81.05]
- 82.0 Troubleshoot the boot process and other system issues. [Student Performance Standards: 82.01, 82.02, 82.03, 82.04, 82.05, 82.06]

- 83.0 Configure the desktop. [Student Performance Standards: 83.01, 83.02, 83.03, 83.04]
- 84.0 Configure IP addresses and name resolution. [Student Performance Standards: 84.01, 84.02, 84.03, 84.04, 84.05, 84.06, 84.07]
- 85.0 Configure the client to work in a network environment. [Student Performance Standards: 85.01, 85.02, 85.03, 85.04, 85.05, 85.06, 85.07]
- 86.0 Support remote users. [Student Performance Standards: 86.01, 86.02, 86.03, 86.04, 86.05, 86.06, 86.07, 86.08 86.09]
- 87.0 Configure a client OS for mobile computing. [Student Performance Standards: 87.01, 87.02, 87.03]
- 88.0 Monitor resources and performance. [Student Performance Standards: 88.01, 88.02, 88.03, 88.04, 88.05]

**OCCUPATIONAL COMPLETION POINT - DATA CODE E  
SYSTEMS ENGINEER - SOC Code - 15-1032**

**Intended outcomes of OCP A, OCP B, OCP C, and OCP D must be completed previously. After completing the following additional competencies, the student will have achieved the occupational completion point of Systems Engineer and the student will be able to:**

- 02.0 Apply communication skills (reading, writing, speaking, listening, and viewing) in a courteous, concise, and correct manner on personal and professional levels. [Student Performance Standards: 02.19]
- 20.0 Participate in work-based learning experiences. [Student Performance Standards: 20.29, 20.30, 20.31]
- 90.0 Plan a network infrastructure. [Student Performance Standards: 90.01, 90.02, 90.03, 90.04]
- 91.0 Plan and optimize a TCP/IP physical and logical network. [Student Performance Standards: 91.01, 91.02, 91.03]
- 92.0 Plan and troubleshoot routing. [Student Performance Standards: 92.01, 92.02, 92.03, 92.04]
- 93.0 Plan a DHCP strategy. [Student Performance Standards: 93.01, 93.02, 93.03]
- 94.0 Plan a DNS strategy. [Student Performance Standards: 94.01, 94.02, 94.03, 94.04]
- 95.0 Optimize and troubleshoot DNS. [Student Performance Standards: 95.01, 95.02, 95.03, 95.04]
- 96.0 Plan and troubleshoot IPSEC. [Student Performance Standards: 96.01, 96.02, 96.03, 96.04]
- 97.0 Plan a network access. [Student Performance Standards: 97.01, 97.02, 97.03, 97.04]
- 98.0 Troubleshoot network access. [Student Performance Standards: 98.01, 98.02, 98.03, 98.04]
- 99.0 Analyze global director infrastructure. [Student Performance Standards: 99.01, 99.02, 99.03, 99.04]
- 100.0 Implement a global directory structure and domain. [Student Performance Standards: 100.01, 100.02, 100.03, 100.04, 100.05]
- 101.0 Implement an organizational unit structure. [Student Performance Standards: 101.01, 101.02, 101.03]
- 102.0 Implement user, group, and computer accounts. [Student Performance Standards: 102.01, 102.02, 102.03, 102.04, 102.05, 102.06]

- 103.0 Implement group policy. [Student Performance Standards: 103.01, 103.02, 103.03, 103.04, 103.05]
- 104.0 Deploy and manage software by using group policies. [Student Performance Standards: 104.01, 104.02, 104.03, 104.04, 104.05, 104.06]
- 105.0 Implement sites to manage global directory replication. [Student Performance Standards: 105.01, 105.02, 105.03, 105.04, 105.05]
- 106.0 Implement placement of domain controllers. [Student Performance Standards: 106.01, 106.02, 106.03]
- 107.0 Use a framework for designing security and create a security design team. [Student Performance Standards: 107.01, 107.02, 107.03]
- 108.0 Recognize and predict common threats by using a threat model. [Student Performance Standards: 108.01, 108.02]
- 109.0 Apply a framework for planning risk management. [Student Performance Standards: 109.01, 109.02]
- 110.0 Design security for physical resources. [Student Performance Standards: 110.01, 110.02]
- 111.0 Design security for computers. [Student Performance Standards: 111.01, 111.02]
- 112.0 Design security for accounts. [Student Performance Standards: 112.01, 112.02]
- 113.0 Design security for authentication. [Student Performance Standards: 113.01, 113.02]
- 114.0 Design security for data. [Student Performance Standards: 114.01, 114.02]
- 115.0 Design security for data transmission. [Student Performance Standards: 115.01, 115.02]
- 116.0 Design security for network perimeter. [Student Performance Standards: 116.01, 116.02]
- 117.0 Design an audit policy and an incident response procedure. [Student Performance Standards: 117.01, 117.02, 117.03]

**OCCUPATIONAL COMPLETION POINT - DATA CODE F**

**WIRELESS NETWORK ADMINISTRATOR - SOC Code - 15-1080**

**Intended outcomes of OCP A, OCP B, OCP C, OCP D, and OCP E must be completed previously. After completing the following additional competencies, the student will have achieved the occupational completion point of Wireless Network Administrator and the student will be able to:**

- 20.0 Participate in work-based learning experiences. [Student Performance Standards: 20.29, 20.30, 20.32]
- 120.0 Demonstrate proficiency in applying radio frequency (RF) technologies. [Student Performance Standards: 120.01, 120.02, 120.03, 120.04, 120.05, 120.06, 120.07]
- 121.0 Develop an awareness of wireless LAN technologies. [Student Performance Standards: 121.01, 121.02, 121.03, 121.04]
- 122.0 Perform implementation and management activities. [Student Performance Standards: 122.01, 122.02, 122.03, 122.04, 122.05, 122.06, 122.07, 122.08, 122.09, 122.10, 122.11, 122.12, 122.13, 122.14, 122.15]
- 123.0 Develop an awareness of wireless security systems. [Student Performance Standards: 123.01, 123.02, 123.03, 123.04, 123.05]

- 124.0 Demonstrate knowledge of wireless industry standards.  
[Student Performance Standards: 124.01, 124.02, 124.03,  
124.04, 123.05]

**OCCUPATIONAL COMPLETION POINT - DATA CODE G**

**DATA COMMUNICATIONS ANALYST - SOC Code - 15-1081**

**Intended outcomes of OCP A, OCP B, OCP C, OCP D, OCP E, OCP F must be completed previously. After completing the following additional competencies, the student will have achieved the occupational completion point of Data Communications Analyst and the student will be able to:**

- 20.0 Participate in work-based learning experiences. [Student Performance Standards: 20.29, 20.30, 20.32]
- 130.0 Demonstrate a knowledge of general security concepts. [Student Performance Standards: 130.01, 130.02, 130.03, 130.04, 130.05, 130.06]
- 131.0 Develop an awareness of communication security concepts. [Student Performance Standards: 131.05, 131.06, 131.07, 131.08, 131.09]
- 132.0 Develop an awareness of network infrastructure security. [Student Performance Standards: 132.16, 132.17, 132.18, 132.19, 132.20, 132.21, 132.22, 132.23]
- 133.0 Develop an awareness of cryptography and its relation to security. [Student Performance Standards: 133.06, 133.07, 133.08]
- 134.0 Incorporate organizational and operational security in an appropriate and effective manner. [Student Performance Standards: 134.06, 134.07, 134.08, 134.09, 134.10, 134.11, 134.12, 134.13, 134.14]

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

Program Title: Network Systems Administration  
Secondary Number: 8207440  
Postsecondary Number: B079300

OCCUPATIONAL COMPLETION POINT - DATA CODE A  
INFORMATION TECHNOLOGY ASSISTANT - SOC Code - 43-4000

Computing for College and Careers competencies :

**INFORMATION SYSTEMS**

01.0 DEMONSTRATE KNOWLEDGE, SKILL, AND APPLICATION OF INFORMATION SYSTEMS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data. (LA.B.1.4.3)
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks. (LA.B.2.4.4)
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software. (LA.B.2.4.4, LA.A.2.4.6)
- 01.05 Demonstrate basic computer file management skills. (LA.A.2.4.2, LA.B.2.4.4, LA.B.2.4.6)
- 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment. (LA.D.2.4.4)
- 01.07 Describe ethical issues and problems associated with computers and information systems.
- 01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

**WORKPLACE COMMUNICATIONS**

02.0 DEMONSTRATE COMPREHENSION AND COMMUNICATION SKILLS-The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 USE TECHNOLOGY TO ENHANCE THE EFFECTIVENESS OF COMMUNICATION SKILLS-  
The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.  
(LA.B.1.4.1)
- 03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.  
(LA.B.1.4.1, LA.B.1.4.2, LA.B.1.4.3)
- 03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.  
(LA.B.2.4.1, LA.B.2.4.2)
- 03.05 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
- 03.06 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

**MANAGEMENT**

04.0 DEVELOP AN AWARENESS OF MANAGEMENT FUNCTIONS AND ORGANIZATIONAL STRUCTURES AS THEY RELATE TO TODAY'S WORKPLACE AND EMPLOYER/EMPLOYEE ROLES-The student will be able to:

- 04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
- 04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
- 04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 PRACTICE QUALITY PERFORMANCE IN THE LEARNING ENVIRONMENT AND THE WORKPLACE-The student will be able to:

- 05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
- 05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 INCORPORATE APPROPRIATE LEADERSHIP AND SUPERVISION TECHNIQUES, CUSTOMER SERVICE STRATEGIES, AND STANDARDS OF PERSONAL ETHICS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
- 06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
- 06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

## **MATHEMATICS AND FINANCE**

07.0 APPLY MATHEMATICAL OPERATIONS AND PROCESSES AS WELL AS FINANCIAL PLANNING STRATEGIES TO COMMONLY OCCURRING SITUATIONS IN THE WORKPLACE TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures. (MA.E.1.4.1, MA.E.A.4.2)
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time). (MA.B.3.4.1)
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate. (MA.A.3.4.3)

## **JOB READINESS AND CAREER DEVELOPMENT**

08.0 ASSESS PERSONAL STRENGTHS AND WEAKNESSES AS THEY RELATE TO JOB OBJECTIVES, CAREER EXPLORATION, PERSONAL DEVELOPMENT, AND LIFE GOALS-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 INCORPORATE KNOWLEDGE GAINED FROM INDIVIDUAL ASSESSMENT AND JOB/CAREER EXPLORATION TO DESIGN AN INDIVIDUAL CAREER PLAN THAT REFLECTS THE TRANSITION FROM SCHOOL TO WORK, LIFELONG LEARNING, AND PERSONAL AND PROFESSIONAL GOALS-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up). (LA.C.3.4.4)
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

## **HUMAN RELATIONS/INTERPERSONAL SKILLS**

10.0 DEMONSTRATE HUMAN RELATIONS/INTERPERSONAL SKILLS APPROPRIATE FOR THE WORKPLACE-The student will be able to:

- 10.01 Accept constructive criticism. (SS.B.1.4.5)
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations. (LA.D.1.4.2, SS.B.1.4.5)
- 10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

## **ADMINISTRATIVE PROCEDURES**

13.0 PERFORM FUNCTIONS AND RESPONSIBILITIES TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 13.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

## **NETWORK/SOFTWARE SUPPORT**

41.0 PERFORM E-MAIL ACTIVITIES-The student will be able to:

- 41.01 Describe e-mail capabilities and functions.
- 41.09 Use the Internet to perform e-mail activities.

42.0 DEMONSTRATE OPERATING SYSTEMS-The student will be able to:

- 42.01 Identify operating system file naming conventions.
- 42.10 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
- 42.12 Demonstrate a working knowledge of standard file formats.
- 42.14 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

## **INFORMATION TECHNOLOGY**

67.0 DEVELOP AN AWARENESS OF EMERGING TECHNOLOGIES-The student will be able to:

- 67.01 Compare and contrast various methods of evaluation for emerging technologies.
- 67.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
- 67.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

**OR**

Introduction to Information Technology competencies:

## **INFORMATION SYSTEMS**

01.0 DEMONSTRATE KNOWLEDGE, SKILL, AND APPLICATION OF INFORMATION SYSTEMS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.07 Describe ethical issues and problems associated with computers and information systems.

## **WORKPLACE COMMUNICATIONS**

02.0 USE TECHNOLOGY TO APPLY AND ENHANCE COMMUNICATION SKILLS IN TECHNICAL READING, WRITING, SPEAKING, LISTENING, AND VIEWING-The student will be able to:

- 02.03 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.62 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.63 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.64 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.65 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.66 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 USE TECHNOLOGY TO ENHANCE THE EFFECTIVENESS OF COMMUNICATION SKILLS-The student will be able to:

- 03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
- 03.06 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

## **MANAGEMENT**

04.0 DEVELOP AN AWARENESS OF MANAGEMENT FUNCTIONS AND ORGANIZATIONAL STRUCTURES AS THEY RELATE TO TODAY'S WORKPLACE AND EMPLOYER/EMPLOYEE ROLES-The student will be able to:

- 04.01 Explore, design, implement, and evaluate organizational structures and cultures. Explore and demonstrate an awareness

of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.

04.02 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 PRACTICE QUALITY PERFORMANCE IN THE LEARNING ENVIRONMENT AND THE WORKPLACE-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).

05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 INCORPORATE APPROPRIATE LEADERSHIP AND SUPERVISION TECHNIQUES, CUSTOMER SERVICE STRATEGIES, AND STANDARDS OF PERSONAL ETHICS TO ACCOMPLISH JOB

OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

06.03 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

#### **MATHEMATICS AND FINANCE**

07.0 APPLY MATHEMATICAL OPERATIONS AND PROCESSES AS WELL AS FINANCIAL PLANNING STRATEGIES TO COMMONLY OCCURRING SITUATIONS IN THE WORKPLACE TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.

07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).

07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

#### **JOB READINESS AND CAREER DEVELOPMENT**

08.0 ASSESS PERSONAL STRENGTHS AND WEAKNESSES AS THEY RELATE TO JOB OBJECTIVES, CAREER EXPLORATION, PERSONAL DEVELOPMENT, AND LIFE GOALS-The student will be able to:

08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.

08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 INCORPORATE KNOWLEDGE GAINED FROM INDIVIDUAL ASSESSMENT AND JOB/CAREER EXPLORATION TO DESIGN AN INDIVIDUAL CAREER PLAN THAT REFLECTS THE TRANSITION FROM SCHOOL TO WORK, LIFELONG LEARNING, AND PERSONAL AND PROFESSIONAL GOALS-The student will be able to:

- 09.15 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
- 09.16 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
- 09.17 Describe job requirements for the variety of occupations and professions within the global world of information technology.
- 09.18 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
- 09.19 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
- 09.20 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 DEMONSTRATE HUMAN RELATIONS/INTERPERSONAL SKILLS APPROPRIATE FOR THE WORKPLACE-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

#### **WORK-BASED LEARNING**

20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES-The student will be able to:

- 20.44 Participate in work-based learning experiences in an information technology environment.
- 20.46 Discuss the use of technology in an information technology environment.

#### **NETWORK/SOFTWARE SUPPORT**

41.0 PERFORM E-MAIL ACTIVITIES-The student will be able to:

- 41.01 Describe e-mail capabilities and functions.
- 41.02 Identify components of an e-mail message.
- 41.03 Identify the components of an e-mail address.
- 41.04 Identify when to use different e-mail options.
- 41.05 Attach a file to an e-mail message.
- 41.06 Forward an e-mail message.
- 41.07 Use an address book.
- 41.08 Reply to an e-mail message.
- 41.09 Use the Internet to perform e-mail activities.
- 41.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
- 41.12 Identify when to include information from an original e-mail message in a response.

41.13 Identify common problems associated with widespread use of e-mail.

42.0 DEMONSTRATE KNOWLEDGE OF DIFFERENT OPERATING SYSTEMS—The student will be able to:

42.01 Identify operating system file naming conventions.

42.10 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).

42.12 Demonstrate a working knowledge of standard file formats.

42.14 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

#### **WEB DESIGN**

55.0 DEMONSTRATE PROFICIENCY NAVIGATING THE INTERNET, INTRANET, AND THE WWW—The student will be able to:

55.01 Identify and describe Web terminology.

55.10 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).

55.11 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).

55.14 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.

55.15 Trace the evolution of the Internet from its inception to the present and into the future.

55.16 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).

55.17 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).

55.18 Identify effective Boolean search strategies.

56.0 DEMONSTRATE PROFICIENCY USING HTML COMMANDS—The student will be able to:

56.01 Identify elements of a Web page.

56.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).

56.03 Define basic HTML terminology.

56.04 Analyze HTML source code developed by others.

56.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, and tables).

56.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).

56.08 Edit and test HTML documents for accuracy and validity.

56.17 Use basic functions of WYSIWYG editors.

56.18 Use basic functions of HTML, DHTML, and XML editors and converters.

56.19 Enhance web pages through the addition of images and graphics including animation.

57.0 DEMONSTRATE PROFICIENCY IN PAGE DESIGN APPLICABLE TO THE WWW—The student will be able to:

57.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.

57.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).

- 57.04 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD ROMs).
- 57.05 Use image design software to create and edit images.
- 57.25 Demonstrate proficiency in publishing to the Internet.
- 57.26 Demonstrate proficiency in adding downloadable forms to web pages.
- 57.27 Explain the need for web-based applications.

63.0 DEMONSTRATE PROFICIENCY USING SPECIALIZED WEB DESIGN SOFTWARE-The student will be able to:

- 63.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
- 63.02 Demonstrate use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

**INFORMATION TECHNOLOGY**

64.0 DEVELOP AN AWARENESS OF THE INFORMATION TECHNOLOGY INDUSTRY-The student will be able to:

- 64.01 Explain how information technology impacts the operation and management of business and society.
- 64.04 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
- 64.05 Explain the emergence of a paperless society.

65.0 DEVELOP AN AWARENESS OF MICROPROCESSORS AND DIGITAL COMPUTERS-The student will be able to:

- 65.01 Describe the evolution of the digital computer.
- 65.02 Explain the general architecture of a microcomputer system.
- 65.03 Explain the evolution of microprocessors.
- 65.04 Explain software hierarchy and its impact on microprocessors.
- 65.05 Explain the need for and use of peripherals.
- 65.06 Demonstrate proficiency using peripherals.
- 65.07 Identify the basic concepts of computer maintenance and upgrades.
- 65.08 Differentiate between diagnosing and troubleshooting.

66.0 DEVELOP AN AWARENESS OF PROGRAMMING LANGUAGES-The student will be able to:

- 66.01 Explain the history of programming languages.
- 66.02 Explain the need for and use of compilers.
- 66.03 Explain how compilers work.
- 66.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

67.0 DEVELOP AN AWARENESS OF EMERGING TECHNOLOGIES-The student will be able to:

- 67.01 Compare and contrast various methods of evaluation for emerging technologies.
- 67.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
- 67.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

69.0 DEMONSTRATE AN UNDERSTANDING OF THE SEVEN LAYERS OF THE OPEN SYSTEMS INTERFACE (OSI) MODEL-The student will be able to:

- 69.01 Describe the evolution of OSI from its inception to the present and into the future.
- 69.02 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.
- 69.04 Identify types of networks and how they work.
- 69.06 Identify the role of servers and clients on a network.
- 69.07 Identify benefits and risks of networked computing.
- 69.08 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
- 69.09 Identify Intranets, Extranets and how they relate to the Internet.
- 69.11 Demonstrate basic understanding of network administration.

**SOFTWARE APPLICATIONS**

70.0 DEMONSTRATE PROFICIENCY USING COMMON SOFTWARE APPLICATIONS-The student will be able to:

- 70.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
- 70.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

71.0 DEMONSTRATE PROFICIENCY USING SPECIALIZED SOFTWARE APPLICATIONS-The student will be able to:

- 71.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
- 71.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
- 71.06 Demonstrate the ability to incorporate digital sound.

**OCCUPATIONAL COMPLETION POINT - DATA CODE B**  
**COMPUTER SUPPORT ASSISTANT - SOC Code - 15-1041**

**MANAGEMENT**

08.0 INCORPORATE APPROPRIATE LEADERSHIP AND SUPERVISION TECHNIQUES, CUSTOMER SERVICE STRATEGIES, AND STANDARDS OF PERSONAL ETHICS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 08.17 Develop strategies for resolving customer conflicts.

**NETWORK/SOFTWARE SUPPORT**

**30.0 IDENTIFY, INSTALL, CONFIGURE, AND UPGRADE DESKTOP AND SERVER COMPUTER MODULES AND PERIPHERALS, FOLLOWING ESTABLISHED BASIC PROCEDURES FOR SYSTEM ASSEMBLY AND DISASSEMBLY OF FIELD REPLACEABLE MODULES—The student will be able to:**

- 30.01 Identify and describe the functions of main processing boards (e.g., CPUs, RAM, ROM, bus architecture).
- 30.02 Identify and describe the functions of communication ports (e.g., serial and parallel ports).
- 30.03 Identify and describe the functions of peripheral devices (e.g., scanners, modems, hard drives, printers).
- 30.04 Identify and describe the components of portable systems (e.g., battery, LCD, AC adapter, PDAs).
- 30.05 Troubleshoot, install and upgrade computers and peripherals
- 30.06 Perform system hardware setup Demonstrate an understanding of input/output devices
- 30.07 Installation and configuration of applications software, hardware, and device drivers.
- 30.08 Demonstrate an understanding of the operation and purpose of hardware components
- 30.09 Install operating system software.
- 30.10 Customize operating systems.
- 30.11 Install application software.
- 30.12 Perform storage formatting and preparation activities.
- 30.13 Identify data measurement (e.g., bits, bytes, kilobytes).
- 30.14 Install and Configure RAID.
- 30.15 Recognize and report on server room environmental issues (temperature, humidity/ESD/power surges, back-up).

**31.0 DIAGNOSE AND TROUBLESHOOT COMMON MODULE PROBLEMS AND SYSTEM MALFUNCTIONS OF COMPUTER SOFTWARE, HARDWARE, PERIPHERALS, AND OTHER OFFICE EQUIPMENT--The student will be able to:**

- 31.01 Troubleshoot a personal computer system
- 31.02 Identify configuration problems.
- 31.03 Identify software problems.
- 31.04 Identify hardware malfunctions.
- 31.05 Identify network malfunctions
- 31.06 Resolve computer error messages.
- 31.07 Understand and troubleshoot memory and cache systems.
- 31.08 Verify that drives are the appropriate type.
- 31.09 Describe knowledge database search procedures used to identify possible solutions when troubleshooting software and hardware problems.

**32.0 IDENTIFY ISSUES, PROCEDURES AND DEVICES FOR PROTECTION WITHIN THE COMPUTING ENVIRONMENT, INCLUDING PEOPLE, HARDWARE AND THE SURROUNDING WORKSPACE—The student will be able to:**

- 32.01 Apply basic rules for hardware safety.
- 32.02 Demonstrate proficiency in basic preventative hardware maintenance.
- 32.03 Special disposal procedures that comply with environmental guidelines for batteries, CRTs, toner kits/cartridges, chemical solvents and cans, and MSDS.
- 32.04 Apply ergonomic principles applicable to the configuration of computer workstations.
- 32.05 Describe ethical issues and problems associated with computers and information systems.

**33.0 IDENTIFY SPECIFIC TERMINOLOGY, FACTS, WAYS AND MEANS OF DEALING WITH CLASSIFICATIONS, CATEGORIES AND PRINCIPLES OF MOTHERBOARDS, PROCESSORS AND MEMORY IN DESKTOP AND SERVER COMPUTER SYSTEMS—The student will be able to:**

- 33.01 Identify EDO RAM ,DRAM, SRAM, RIMM, VRAM, SDRAM, and WRAM.
- 33.02 Identify memory banks, memory chips (8-bit, 16-bit, and 32-bit), SIMMS (Single In-line Memory Module), DIMMS (Dual In-line Memory Module), parity chips versus non-parity chips.
- 33.03 Identify printer parallel port, COM/serial port, floppy drive, hard drive, Memory, and Boot sequence.

**33.0 DEMONSTRATE KNOWLEDGE OF BASIC TYPES OF PRINTERS, BASIC CONCEPTS, PRINTER COMPONENTS, HOW THEY WORK, HOW THEY PRINT ONTO A PAGE, PAPER PATH, CARE AND SERVICE TECHNIQUES, AND COMMON PROBLEMS—The student will be able to:**

- 34.01 Identify types of printers—laser, inkjet, dot matrix.
- 34.02 Identify care and service techniques and common problems with primary printer types.
- 34.03 Implement and manage printing on a network.

**34.0 IDENTIFY AND DESCRIBE BASIC NETWORK CONCEPTS AND TERMINOLOGY, ABILITY TO DETERMINE WHETHER A COMPUTER IS NETWORKED, KNOWLEDGE OF PROCEDURES FOR SWAPPING AND CONFIGURING NETWORK INTERFACE CARDS, AND KNOWLEDGE OF THE RAMIFICATIONS OF REPAIRS WHEN A COMPUTER IS NETWORKED—The student will be able to:**

- 35.01 Define networking and describe the purpose of a network.
- 35.02 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).
- 35.03 Describe the various types of network topologies.
- 35.04 Identify and describe the purpose of standards, protocols, and the Open Systems Interconnection (OSI) reference model.
- 35.05 Configure network and verify network connectivity.
- 35.06 Discuss the responsibilities of the network administrator (e.g., rights and responsibilities).
- 35.07 Develop user logon procedures.
- 35.08 Utilize network management infrastructures (e.g., network monitoring, alerting, security) to perform administrative tasks.
- 35.09 Identify common backup strategies and procedures.
- 35.10 Select and use appropriate electronic communications software and hardware for specific tasks.
- 35.11 Compare and contrast Internet software and protocols.
- 35.12 Diagnose and resolve electronic communications operational problems.
- 35.13 Design and implement directory tree structures.
- 35.14 Install services tools (SNMP, backup software)
- 35.15 Perform full backup and verify backup
- 35.16 Identify bottlenecks (e.g., processor, bus transfer, I/O, disk I/O, network I/O, memory).
- 35.17 Use the concepts of fault tolerance/fault recovery to create a disaster recovery plan.
- 35.18 Document and test disaster recovery plan regularly, and update as needed.

35.0 PERFORM END USER SUPPORT AND ASSISTANCE BY TROUBLESHOOTING AND DIAGNOSING THROUGH TELEPHONE, E-MAIL, INTERNET, REMOTE ACCESS, OR DIRECT CONTACT—The student will be able to:

- 36.01 Apply call center vocabulary.
- 36.02 Listen and input information simultaneously.
- 36.03 Apply first response assistance for minor repair work.

38.0 DEMONSTRATE PROFICIENCY USING GRAPHICAL USER INTERFACE (GUI) OPERATING SYSTEMS—The student will be able to:

- 38.01 Identify parts of GUI windows.
- 38.02 Create and use icons.
- 38.03 Demonstrate proficiency in using menu systems.
- 38.04 Demonstrate proficiency in using pointing and selection devices.
- 38.05 Identify keyboard shortcuts and special function keys.
- 38.06 Demonstrate proficiency in manipulating windows.
- 38.07 Utilize help systems and hypertext links.
- 38.08 Create, organize, and maintain file system directories.
- 38.09 Organize desktop objects.
- 38.10 Run multiple applications.

OCCUPATIONAL COMPLETION POINT - DATA CODE C  
NETWORK SUPPORT TECHNICIAN - SOC Code - 15-1070

#### MANAGEMENT

08.0 INCORPORATE APPROPRIATE LEADERSHIP AND SUPERVISION TECHNIQUES, CUSTOMER SERVICE STRATEGIES, AND STANDARDS OF PERSONAL ETHICS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE—THE STUDENT WILL BE ABLE TO:

- 08.18 Develop diplomatic methods to communicate with customers.

#### WORK-BASED LEARNING

20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES—The student will be able to:

- 20.29 Participate in work-based learning experiences in a network support services environment. LA.C.3.4
- 20.30 Discuss the use of technology in a network environment. LA.C.3.4.

#### NETWORK/SOFTWARE SUPPORT

37.0 PERFORM END USER SUPPORT AND ASSISTANCE BY TROUBLESHOOTING AND DIAGNOSING THROUGH TELEPHONE, E-MAIL, REMOTE ACCESS, OR DIRECT CONTACT—The student will be able to:

- 37.09 Apply first response assistance for minor repair work.

40.0 PERFORM INSTALLATION AND CONFIGURATION ACTIVITIES—The student will be able to:

- 40.01 Configure the operating system environment.

- 40.02 Connect client workstation running similar operating system to the network.
- 40.03 Configure Internet access for a network.
- 40.04 Configure a Web server.
- 40.05 Use remote server to deploy operating system.
- 40.06 Troubleshoot failed installations.
- 40.07 Install and configure network services for interoperability.
- 40.08 Monitor, configure troubleshoot and control access to printers.
- 40.09 Monitor, configure troubleshoot and control access to files, folders, and shared folders.
- 40.10 Monitor, configure troubleshoot and control access to Web sites.

**41.0 DEMONSTRATE PROFICIENCY USING COMPUTER NETWORKS—The student will be able to:**

- 41.01 Identify and describe the purpose of standards, protocols, and the Open Systems Interconnection (OSI) reference model.

**42.0 DEMONSTRATE PROFICIENCY IN CONFIGURING AND TROUBLESHOOTING HARDWARE DEVICES AND DRIVERS— The student will be able to:**

- 42.01 Configure hardware devices.
- 42.02 Configure driver signing options.
- 42.03 Update device drivers.
- 42.04 Troubleshoot problems with hardware.

**43.0 DEMONSTRATE PROFICIENCY IN MANAGING, MONITORING, AND OPTIMIZING SYSTEM PERFORMANCE, RELIABILITY AND AVAILABILITY—The student will be able to:**

- 43.01 Monitor and optimize usage of system resources.
- 43.02 Manage processes.
- 43.03 Optimize disk performance.
- 43.04 Manage and optimize availability of system data and user data.
- 43.05 Recover systems and user data.

**44.0 DEMONSTRATE PROFICIENCY IN MANAGING, CONFIGURING AND TROUBLESHOOTING STORAGE USE—The student will be able to:**

- 44.02 Configure and manage user profiles.
- 44.03 Monitor, configure and troubleshoot disks and volumes.
- 44.04 Configure data compression.
- 44.05 Monitor and configure disk quotas.
- 44.06 Recover from disk failures.

**45.0 DEMONSTRATE PROFICIENCY IN CONFIGURING AND TROUBLESHOOTING NETWORK CONNECTIONS--The student will be able to:**

- 45.01 Install, configure and troubleshoot shared access.
- 45.02 Install, configure and troubleshoot a virtual private network.
- 45.03 Install, configure and troubleshoot network protocols.
- 45.04 Install and configure network services.
- 45.05 Configure, monitor and troubleshoot remote access.
- 45.06 Install, configure, monitor, and troubleshoot Terminal Services.

- 45.07 Configure the properties of a connection.
- 45.08 Install, configure, and troubleshoot network adapters and drivers.

**46.0 DEMONSTRATE PROFICIENCY IN IMPLEMENTING, MONITORING, AND TROUBLESHOOTING SECURITY--The student will be able to:**

- 46.02 Encrypt data on a hard disk by using Encrypting File System.
- 46.03 Implement, configure, manage and troubleshoot policies in an operating system environment.
- 46.04 Implement, configure, manage and troubleshoot auditing.
- 46.05 Implement, configure, manage and troubleshoot local accounts.
- 46.06 Implement, configure, manage and troubleshoot account policy.
- 46.07 Implement, configure, manage and troubleshoot security by using the Security Configuration Tool Set.

OCCUPATIONAL COMPLETION POINT - DATA CODE D  
SYSTEMS ADMINISTRATOR - SOC Code - 15-1031

**MANAGEMENT**

**08.0 INCORPORATE APPROPRIATE LEADERSHIP AND SUPERVISION TECHNIQUES, CUSTOMER SERVICE STRATEGIES, AND STANDARDS OF PERSONAL ETHICS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE--The student will be able to:**

08.18 Develop diplomatic methods to communicate with customers, clients, and end-users of information technology services.

**WORK-BASED LEARNING**

**20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES - The student will be able to:**

20.29 Participate in work-based learning experiences in a network support services environment.

20.30 Discuss the use of technology in a network support services environment.

20.32 Discuss the management/supervisors skills needed in a network support services environment.

**NETWORK/SOFTWARE SUPPORT**

**50.0 ADMINISTER ACCOUNTS AND RESOURCES ON COMPUTERS RUNNING SERVER OPERATING SYSTEM SOFTWARE IN A NETWORKED ENVIRONMENT--The student will be able to:**

50.01 Describe features of server operating system.

50.02 Log on to the server operating system.

50.03 Install and configure administrative tools.

50.04 Create user accounts.

50.05 Create computer accounts.

50.06 Create an organizational unit.

**51.0 MODIFY USER AND COMPUTER ACCOUNTS ON COMPUTERS RUNNING A SERVER OPERATING SYSTEM IN A NETWORKED ENVIRONMENT--The student will be able to:**

51.01 Modify user and computer account properties.

51.02 Enable and unlock user and computer accounts.

51.03 Create a user account template.

51.04 Locate user and computer accounts in a global directory structure.

51.05 Save queries.

51.06 Reset user and computer accounts.

51.07 Move domain objects.

**52.0 PERFORM VARIOUS ADMINISTRATIVE FUNCTIONS USING GROUPS--The student will be able to:**

52.01 Create groups.

52.02 Manage group membership

52.03 Apply strategies for using groups

52.04 Modify groups.

- 52.05 Manage default groups.
- 53.0 **ENABLE RESOURCE ACCESS WITH PERMISSIONS, MANAGE ACCESS TO FILES AND FOLDERS USING PERMISSIONS, AND MANAGE PERMISSION INHERITANCE**—The student will be able to:
  - 53.01 Manage access to resources.
  - 53.02 Manage access to shared folders.
  - 53.03 Manage access to files and folders by using file system permissions.
  - 53.04 Determine effective permissions.
  - 53.05 Manage access to shared files by using offline caching.
- 54.0 **IMPLEMENT PRINTING IN A NETWORKED ENVIRONMENT UTILIZING A PARTICULAR SERVER OPERATING SYSTEM**—The student will be able to:
  - 54.01 Install and share printers.
  - 54.02 Manage access to printers by using shared printer permissions.
  - 54.03 Manage printer drivers.
  - 54.04 Implement printer locations.
- 55.0 **SET UP A NETWORK-WIDE PRINTING STRATEGY TO MEET THE NEEDS OF USERS AND TROUBLESHOOT INSTALLATION OR CONFIGURATION PROBLEMS**—The student will be able to:
  - 55.01 Change the location of the print spooler.
  - 55.02 Set printing priorities.
  - 55.03 Schedule printer availability.
  - 55.04 Configure a printing tool.
- 56.0 **UTILIZE AVAILABLE PERMISSIONS FOR MANAGING ACCESS TO GLOBAL DIRECTORY OBJECTS, HOW TO MOVE OBJECTS BETWEEN ORGANIZATIONAL UNITS IN THE SAME DOMAIN, AND HOW TO DELEGATE CONTROL OF AN ORGANIZATIONAL UNIT**—The student will be able to:
  - 56.01 Identify the role of organizational units.
  - 56.02 Modify permissions for global directory objects.
  - 56.03 Delegate control of organizational units.
- 57.0 **USE GROUP POLICY TO CONFIGURE FOLDER REDIRECTION, BROWSER CONNECTIVITY, AND THE DESKTOP**—The student will be able to:
  - 57.01 Configure group policy settings.
  - 57.02 Assign scripts with group policy.
  - 57.03 Configure folder redirection.
- 58.0 **MANAGE COMPUTER SECURITY IN A SECURITY IN A NETWORKING ENVIRONMENT**—The student will be able to:
  - 58.01 Describe the security features a server operating system.
  - 58.02 Use security templates to secure computers.
  - 58.03 Test computer security policy.
  - 58.04 Configure auditing.
  - 58.05 Manage security logs.
- 59.0 **ADMINISTER SERVERS REMOTELY**—The student will be able to:

- 59.01 Explain the tasks, tools, and rights that are required to administer a server.
- 59.02 Configure remote access for administration and client preferences.
- 59.03 Manage remote desktop connections.

**60.0 MONITOR SERVER PERFORMANCE BY USING PERFORMANCE TOOLS, CONFIGURE AND MANAGE PERFORMANCE LOGS, CONFIGURE AND MANAGE ALERTS, AND MANAGE SYSTEM MONITOR VIEWS—The student will be able to:**

- 60.01 Establish a performance baseline.
- 60.02 Perform real-time and logged monitoring.
- 60.03 Configure and manage counter logs.
- 60.04 Configure alerts.

**61.0 COLLECT PERFORMANCE DATA BY MONITORING PRIMARY SERVER SUBSYSTEMS AND IDENTIFY SYSTEM BOTTLENECKS BY USING THE PERFORMANCE MONITORING SOFTWARE—The student will be able to:**

- 61.01 Explain how the four primary server subsystems affect server performance.
- 61.02 Monitor server memory.
- 61.03 Monitor processor usage.
- 61.04 Monitor disks.
- 61.05 Monitor network usage.
- 61.06 Identify the guidelines for using counters and thresholds.
- 61.07 Describe the best practices for monitoring server performance.

**62.0 MAINTAINING DEVICE DRIVERS—The student will be able to:**

- 62.01 Configure device driver signing.
- 62.02 Restore the previous version of a device driver.

**63.0 USE SOFTWARE TOOLS TO MANAGE AND SET UP DISKS—The student will be able to:**

- 63.01 Initialize and partition a disk.
- 63.02 View and update disk properties.
- 63.03 Manage mounted drives.
- 63.04 Create volumes on a disk.
- 63.05 Convert a disk from basic to dynamic and from dynamic to basic.
- 63.06 Import disks.

**64.0 USE FILE ENCRYPTION FOR SECURITY OF DATA—The student will be able to:**

- 64.01 Manage disk based file compression.
- 64.02 Configure file encryption.
- 64.03 Implement disk quotas.

**65.0 PLAN FOR A COMPUTER DISASTER AND USE THE FEATURES OF A SERVER OPERATING SYSTEM TO PREVENT A DISASTER OR RECOVER WHEN ONE OCCURS—The student will be able to:**

- 65.01 Prepare for disaster recovery.
- 65.02 Back up data.

- 65.03 Schedule backup jobs.
- 65.04 Restore data.
- 65.05 Configure a shadow copy.
- 65.06 Recover from server failure.
- 65.07 Select a disaster recovery method.

**66.0 MANAGE AND DISTRIBUTE CRITICAL SOFTWARE UPDATES THAT RESOLVE KNOWN SECURITY VULNERABILITIES AND OTHER STABILITY ISSUES—The student will be able to:**

- 66.01 Install and configure client computers to use receive software updates.
- 66.02 Install and configure servers to use perform software updates.
- 66.03 Manage the Software Update Services infrastructure.

**67.0 CONSTRUCT AND ASSIGN IP ADDRESSES AND ISOLATE ADDRESSING ISSUES ASSOCIATED WITH THE IP ROUTING PROCESS—The student will be able to:**

- 67.01 Convert IP Addresses from decimal to binary.
- 67.02 Calculate a subnet mask.
- 67.03 Create subnets using VLSM and CIDR.
- 67.04 Isolate addressing issues associated with the IP routing process.

**68.0 CONFIGURE AN INTERNET PROTOCOL (IP) ADDRESS FOR CLIENT COMPUTERS—The student will be able to:**

- 68.01 Configure a client to use a static IP address.
- 68.02 Configure a client to obtain an IP address automatically by using DHCP.
- 68.03 Configure a client to obtain an IP address automatically by using Alternate Configuration.

**69.0 CONFIGURE NAME RESOLUTION MECHANISMS FOR CLIENTS ON A NETWORK AND DESCRIBE THE NAME RESOLUTION PROCESS—The student will be able to:**

- 69.01 Use ARP to identify client media access control (MAC) addresses.
- 69.02 Describe the function of Network Basic Input/Output System (NetBIOS).
- 69.03 Configure a client to use a static IP address.
- 69.04 Configure a client to use name resolution servers.

**70.0 ISOLATE COMMON CONNECTIVITY ISSUES AND DESCRIBE HOW TO USE UTILITIES AND TOOLS AS PART OF THIS PROCESS—The student will be able to:**

- 70.01 Isolate common connectivity issues.
- 70.02 Use a flow chart to isolate a problem.
- 70.03 Use utilities and tools to isolate a problem

**71.0 CONFIGURE A ROUTING SOLUTION FOR A NETWORK ENVIRONMENT—The student will be able to:**

- 71.01 Describe the role of routing in the network infrastructure.
- 71.02 Enable and configure the Routing and Remote Access service.
- 71.03 Configure packet filters.

- 72.0 ALLOCATE IP ADDRESSING IN A NETWORK ENVIRONMENT—The student will be able to:
- 72.01 Describe the role of DHCP in the network infrastructure.
  - 72.02 Add and authorize a DHCP Server service.
  - 72.03 Configure a DHCP scope.
  - 72.04 Configure DHCP options.
  - 72.05 Configure a DHCP reservation.
  - 72.06 Configure a DHCP relay agent.
- 73.0 MANAGE THE DHCP SERVICE TO REFLECT CHANGING CLIENT IP ADDRESSING NEEDS AND MONITOR DHCP SERVER PERFORMANCE—The student will be able to:
- 73.01 Manage a DHCP database.
  - 73.02 Monitor DHCP.
  - 73.03 Apply security guidelines for DHCP.
- 74.0 ASSIGN COMPUTER NAMES TO THE IP ADDRESSES OF THE SOURCE AND DESTINATION HOSTS, AND THEN USE THE COMPUTER NAME TO CONTACT THE HOSTS—The student will be able to:
- 74.01 Describe the name resolution process.
  - 74.02 View names on a client.
  - 74.03 Configure host name resolution.
- 75.0 RESOLVE HOST NAMES BY USING DOMAIN NAME SYSTEM—The student will be able to:
- 75.01 Describe the role of DNS in the network infrastructure.
  - 75.02 Install the DNS Server service.
  - 75.03 Configure the properties for the DNS Server service.
  - 75.04 Configure the DNS zones.
  - 75.05 Configure DNS zone transfers.
  - 75.06 Configure dynamic updates.
  - 75.07 Configure a DNS client.
  - 75.08 Delegate authority for zones.
- 76.0 MANAGE AND MONITOR DNS SERVERS TO ENSURE THAT THEY ARE FUNCTIONING PROPERLY AND TO OPTIMIZE NETWORK PERFORMANCE—The student will be able to:
- 76.01 Configure the Time-to-Live (TTL) value.
  - 76.02 Configure aging and scavenging.
  - 76.03 Integrate DNS with WINS.
  - 76.04 Test the DNS server configuration.
  - 76.05 Monitor DNS server performance.
- 77.0 CONFIGURE A SERVER WITH THE ROUTING AND REMOTE ACCESS SERVICE, CREATE APPROPRIATE REMOTE ACCESS CONNECTIONS ON A NETWORK ACCESS SERVER, AND CONFIGURE USERS' ACCESS RIGHTS—The student will be able to:
- 77.01 Describe a network access infrastructure.
  - 77.02 Configure a virtual private network (VPN) connection.
  - 77.03 Configure a dial-up connection.
  - 77.04 Configure a wireless connection.
  - 77.05 Control remote user access to a network.

77.06 Centralize authentication and policy management for network access by using Internet Authentication Service (IAS).

**78.0 MANAGE AND MONITOR NETWORK ACCESS AND THE NETWORK ACCESS SERVICES—The student will be able to:**

78.01 Configure logging on the network access server.  
78.02 Collect and monitor network access data.

**79.0 PERFORM INSTALLATION OF A NETWORK CLIENT OPERATING SYSTEM—The student will be able to:**

79.01 Plan a client operating system installation.  
79.02 Install a client operating system.  
79.03 Upgrade a client operating system from an earlier version.  
79.04 Automate the installation process for a client operating system.

**80.0 INSTALL AND CONFIGURE HARDWARE DEVICES—The student will be able to:**

80.01 Configure hardware devices and drivers on a computer running a client OS.  
80.02 Add and remove devices by using built in utilities and wizards  
80.03 Restore device drivers.

**81.0 CONFIGURE AND MANAGE FILE SYSTEMS—The student will be able to:**

81.01 Work with file systems.  
81.02 Manage data compression.  
81.03 Secure data by using EFS.  
81.04 Configure disk compression.  
81.05 Secure files by using EFS.

**82.0 TROUBLESHOOT THE BOOT PROCESS AND OTHER SYSTEM ISSUES—The student will be able to:**

82.01 Examine the boot process.  
82.02 Control system settings during the boot process.  
82.03 Change startup behavior.  
82.04 Use advanced boot options to troubleshoot startup problems.  
82.05 Restore a computer to a previous state.  
82.06 Troubleshoot the boot process and other system issues.

**83.0 CONFIGURE THE DESKTOP—The student will be able to:**

83.01 Configure user desktop settings.  
83.02 Customize the desktop environment.  
83.03 Configure system settings.  
83.04 Describe how user profiles and group policy affect desktop customization.

**84.0 CONFIGURE IP ADDRESSES AND NAME RESOLUTION—The student will be able to:**

84.01 Configure IP addresses.  
84.02 Troubleshoot IP addresses.  
84.03 Determine TCP/IP name resolution methods.

- 84.04 Configure a DNS and WINS client.
- 84.05 Connect to a remote host.
- 84.06 Configure IP addresses.
- 84.07 Configure the DNS client.

**85.0 CONFIGURE THE CLIENT TO WORK IN A NETWORK ENVIRONMENT—The student will be able to:**

- 85.01 Examine workgroups and user accounts.
- 85.02 Create and authenticate local user accounts.
- 85.03 Configure local security.
- 85.04 Configure logon options.
- 85.05 Configure networking.
- 85.06 Join a domain.
- 85.07 Operate in a domain.

**86.0 SUPPORT REMOTE USERS—The student will be able to:**

- 86.01 Establish remote access connections.
- 86.02 Connect to Virtual Private Networks.
- 86.03 Configure inbound connections.
- 86.04 Configure authentication protocols and encryption.
- 86.05 Using remote desktop.
- 86.06 Store user names and passwords to facilitate remote connections.
- 86.07 Configure a VPN connection.
- 86.08 Configure and using remote desktop.
- 86.09 Store user names and passwords.

**87.0 CONFIGURE A CLIENT OS FOR MOBILE COMPUTING—The student will be able to:**

- 87.01 Configure hardware for mobile computing.
- 87.02 Configure power management options for mobile computing.
- 87.03 Make files, folders, and web pages available for offline use.

**88.0 MONITOR RESOURCES AND PERFORMANCE—The student will be able to:**

- 88.01 Determine system information.
- 88.02 Use task manager to monitor system performance.
- 88.03 Use performance and maintenance tools to improve performance.
- 88.04 Monitor event logs.
- 88.05 Configure program compatibility.

**OCCUPATIONAL COMPLETION POINT - DATA CODE E  
SYSTEMS ENGINEER - SOC Code 15-1032**

**02.0 APPLY COMMUNICATION SKILLS (READING, WRITING, SPEAKING, LISTENING, AND VIEWING) IN A COURTEOUS, CONCISE, AND CORRECT MANNER ON PERSONAL AND PROFESSIONAL LEVELS—The student will be able to:**

- 02.19 Communicate technical information in a concise, understandable manner to a non-technical audience both verbally and in writing.

**20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES--The student will be able to:**

- 20.29 Participate in work-based learning experiences in a network support services environment.
- 20.30 Discuss the use of technology in a network support services environment.
- 20.31 Compare and contrast the software applications used in a network support services environment.

**90.0 PLAN A NETWORK INFRASTRUCTURE--The student will be able to:**

- 90.01 Explain how to plan a network.
- 90.02 Explain how to prepare development and test environments.
- 90.03 Explain the concepts of managing and maintaining a network environment by using specific tools.
- 90.04 Explain the technologies and services implemented in a network.

**91.0 PLAN AND OPTIMIZE A TCP/IP PHYSICAL AND LOGICAL NETWORK--The student will be able to:**

- 91.01 Discuss TCP/IP.
- 91.02 Plan a TCP/IP addressing scheme.
- 91.03 Optimize network performance.

**92.0 PLAN AND TROUBLESHOOT ROUTING--The student will be able to:**

- 92.01 Describe how routing works.
- 92.02 Create a secure routing plan.
- 92.03 Identify TCP/IP routing trouble shooting tools.
- 92.04 Troubleshoot TCP/IP routing.

**93.0 PLAN A DHCP STRATEGY--The student will be able to:**

- 93.01 Demonstrate how DHCP operates in an enterprise environment.
- 93.02 Plan a DHCP strategy.
- 93.03 Secure a DHCP strategy.

**94.0 PLAN A DNS STRATEGY--The student will be able to:**

- 94.01 Plan a namespace strategy.
- 94.02 Plan zones.
- 94.03 Plan zone replication.
- 94.04 Plan a DNS server implementation.

**95.0 OPTIMIZE AND TROUBLESHOOT DNS--The student will be able to:**

- 95.01 Optimize a DNS server.
- 95.02 Optimize the DNS server-to-server communications.
- 95.03 Optimize DNS client support traffic.
- 95.04 Troubleshoot host name resolution.

**96.0 PLAN AND TROUBLESHOOT IPSEC--The student will be able to:**

- 96.01 Discuss IPsec.
- 96.02 Understand IPsec default policies, rules, and settings.
- 96.03 Plan IPsec deployment.

96.04 Troubleshoot IPsec.

**97.0 PLAN A NETWORK ACCESS—The student will be able to:**

- 97.01 Select appropriate connection methods for a network access strategy.
- 97.02 Select a remote access policy strategy.
- 97.03 Select a network access authentication method.
- 97.04 Plan a network access strategy.

**98.0 TROUBLESHOOT NETWORK ACCESS—The student will be able to:**

- 98.01 Identify network access troubleshooting resources.
- 98.02 Troubleshoot network authentication.
- 98.03 Troubleshoot LAN authentication.
- 98.04 Troubleshoot remote access.

**99.0 ANALYZE GLOBAL DIRECTORY INFRASTRUCTURE—The student will be able to:**

- 99.01 Describe the architecture of global directory.
- 99.02 Describe the working of global directory.
- 99.03 Use administrative tools to examine the components of global directory.
- 99.04 Describe the global directory design, planning, and implementation processes.

**100.0 IMPLEMENT A GLOBAL DIRECTORY STRUCTURE AND DOMAIN STRUCTURE—The student will be able to:**

- 100.01 Create a forest and domain structure.
- 100.02 Configure DNS in a global directory environment.
- 100.03 Raise the functional level of a forest and a domain.
- 100.04 Create trust relationships between domains.
- 100.05 Secure trusts by using SID filtering.

**101.0 IMPLEMENT AN ORGANIZATIONAL UNIT STRUCTURE—The student will be able to:**

- 101.01 Create an organizational unit.
- 101.02 Delegate control for an organizational unit.
- 101.03 Plan an organization unit strategy.

**102.0 IMPLEMENT USER, GROUP, AND COMPUTER ACCOUNTS—The student will be able to:**

- 102.01 Describe the types of global directory accounts and groups.
- 102.02 Create multiple user and computer accounts.
- 102.03 Implement UPN suffixes.
- 102.04 Move objects within a domain and across domains in a global structure.
- 102.05 Plan a strategy for user computer and group accounts.
- 102.06 Plan a global directory audit strategy.

**103.0 IMPLEMENT GROUP POLICY—The student will be able to:**

- 103.01 Create and configure group policy objects.
- 103.02 Manage group policy objects.
- 103.03 Verify and troubleshoot group policies.
- 103.04 Delegate administrative control of group policies.

103.05 Plan a group policies strategy for the enterprise.

**104.0 DEPLOY AND MANAGE SOFTWARE BY USING GROUP POLICIES—The student will be able to:**

- 104.01 Explain the basic concepts of software deployment by using group policies.
- 104.02 Deploy software by using group policies.
- 104.03 Configure software deployment by using group policies.
- 104.04 Maintain deployed software by using group policies.
- 104.05 Troubleshoot some common problems with software deployment.
  
- 104.06 Plan a software deployment strategy.

**105.0 IMPLEMENT SITES TO MANAGE GLOBAL DIRECTORY REPLICATION—The student will be able to:**

- 105.01 Explain the components and the process of replication.
- 105.02 Create and configure sites.
- 105.03 Manage a global directory site topology.
- 105.04 Monitor and troubleshoot global directory replication failures.
- 105.05 Plan a site strategy.

**106.0 IMPLEMENT PLACEMENT OF DOMAIN CONTROLLERS—The student will be able to:**

- 106.01 Implement a global catalog in a global directory.
- 106.02 Determine the placement of domain controllers in a global directory.
- 106.03 Create a plan for placing domain controllers in a global directory.

**107.0 USE A FRAMEWORK FOR DESIGNING SECURITY AND CREATE A SECURITY DESIGN TEAM—The student will be able to:**

- 107.01 Describe common elements of security policies and procedures.
- 107.02 Create a security design framework.
- 107.03 Create a security design team.

**108.0 RECOGNIZE AND PREDICT COMMON THREATS BY USING A THREAT MODEL—The student will be able to:**

- 108.01 Explain common network vulnerabilities and how attackers can exploit them.
- 108.02 Predict threats to security by using the STRIDE (Spoofing, Tampering, Repudiation, Information disclosure, Denial of service, and Elevation of privilege) threat model.

**109.0 APPLY A FRAMEWORK FOR PLANNING RISK MANAGEMENT—The student will be able to:**

- 109.01 Explain the purpose and operation of risk management.
- 109.02 Draft the elements of a risk management plan.

**110.0 DESIGN SECURITY FOR PHYSICAL RESOURCES—The student will be able to:**

- 110.01 Determine threats and analyze risks to physical resources.
- 110.02 Design security for physical resources.

**111.0 DESIGN SECURITY FOR COMPUTERS—The student will be able to:**

- 111.01 Determine threats and analyze risks to computers.
- 111.02 Design security for computers.

**112.0 DESIGN SECURITY FOR ACCOUNTS—The student will be able to:**

- 112.01 Determine threats and analyze risks to accounts.
- 112.02 Design security for accounts.

**113.0 DESIGN SECURITY FOR AUTHENTICATION—The student will be able to:**

- 113.01 Determine threats and analyze risks to authentication.
- 114.02 Design security for authentication.

**114.0 DESIGN SECURITY FOR DATA—The student will be able to:**

- 114.01 Determine threats and analyze risks to data.
- 114.02 Design security for data.

**115.0 DESIGN SECURITY FOR DATA TRANSMISSION—The student will be able to:**

- 115.01 Determine threats and analyze risks to data transmission.
- 115.02 Design security for data transmission.

**116.0 DESIGN SECURITY FOR NETWORK PERIMETERS—The student will be able to:**

- 116.01 Determine threats and analyze risks to network perimeters.
- 116.02 Design security for network perimeters.

**117.0 DESIGN AN AUDIT POLICY AND AN INCIDENT RESPONSE PROCEDURE—The student will be able to:**

- 117.01 Explain the importance of auditing and incident response.
- 117.02 Design an auditing policy.
- 117.03 Design an incident response procedure.

**OCCUPATIONAL COMPLETION POINT - DATA CODE F**

**WIRELESS NETWORK ADMINISTRATOR - SOC Code 15-1080**

**WORK-BASED LEARNING**

**20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES - The student will be able to:**

- 20.29 Participate in work-based learning experiences in a network support services environment. LA.C.3.4
- 20.30 Discuss the use of technology in a network support services environment. LA.C.3.4
- 20.32 Discuss the management/supervisory skills needed in a network support service environment.

**120.0 DEMONSTRATE PROFICIENCY IN APPLYING RADIO FREQUENCY (RF) TECHNOLOGIES—The student will be able to:**

- 120.01 Define and apply the basic concepts of RF behavior.
- 120.02 Understand the applications of basic RF antenna concepts.
- 120.03 Understand and apply the basic components of RF mathematics.
- 120.04 Identify some of the different uses for spread spectrum technologies.
- 120.05 Comprehend the differences between, and apply the different types of spread spectrum technologies.
- 120.06 Identify and apply the concepts which make up the functionality of spread spectrum technology.
- 120.07 Identify the laws set forth by the FCC that govern spread spectrum technology, including power outputs, frequencies, bandwidths, hop times, and dwell times.

**121.0 DEVELOP AN AWARENESS OF WIRELESS LAN TECHNOLOGIES—The student will be able to:**

- 121.01 Identify and apply the processes involved in authentication and association.
- 121.02 Recognize the concepts associated with wireless LAN service sets.
- 121.03 Understand the implications of the following power management features of wireless LANs.
- 121.04 Specify the modes of operation involved in the movement of data traffic across wireless LANs.

**122.0 PERFORM IMPLEMENTATION AND MANAGEMENT ACTIVITIES—The student will be able to:**

- 122.01 Identify the technology roles for which wireless LAN technology is an appropriate technology application.
- 122.02 Identify the purpose of infrastructure devices and explain how to install, configure, and manage them.
- 122.03 Identify the purpose of wireless LAN client devices and explain how to install, configure, and manage them.
- 122.04 Identify the purpose of wireless LAN gateway devices and explain how to install, configure, and manage them.
- 122.05 Identify the basic attributes, purpose, and function of types of antennas.
- 122.06 Describe the proper locations and methods for installing antennas.
- 122.07 Explain the concepts of polarization, gain, beamwidth, and free-space path loss as they apply to implementing solutions that require antennas.
- 122.08 Identify the use of wireless LAN accessories and explain how to install, configure, and manage them.
- 122.09 Identify, understand, correct or compensate for wireless LAN implementation challenges.
- 122.10 Explain how antenna diversity compensates for multipath.
- 122.11 Identify and understand the importance and process of conducting a thorough site survey.
- 122.12 Identify and understand the importance of the necessary tasks involved in preparing to do an RF site survey.
- 122.13 Identify the necessary equipment involved in performing a site survey.
- 122.14 Understand the necessary procedures involved in performing a site survey.
- 122.15 Identify and understand site survey reporting procedures.

**123.0 DEVELOP AN AWARENESS OF WIRELESS SECURITY SYSTEMS--The student will be able to:**

- 123.01 Identify the strengths, weaknesses and appropriate uses of wireless LAN security techniques.
- 123.02 Describe types of wireless LAN security attacks, and explain how to identify and prevent them.
- 123.03 Given a wireless LAN scenario, identify the appropriate security solution from the following available wireless LAN security solutions.
- 123.04 Explain the uses of corporate security policies and how they are used to secure a wireless LAN.
- 123.05 Identify how and security precautions are used to secure a wireless LAN.

**124.0 DEMONSTRATE KNOWLEDGE OF WIRELESS INDUSTRY STANDARDS--The student will be able to:**

- 124.01 Identify, apply and comprehend the differences between wireless LAN standards.
- 124.02 Understand the roles of organizations in providing direction and accountability within the wireless LAN industry.
- 124.03 Identify the differences between the ISM and UNII bands.
- 124.04 Identify and understand the differences between the power output rules for point-to-point and point-to-multipoint links.
- 124.05 Identify the basic characteristics of infrared wireless LANs.

**OCCUPATIONAL COMPLETION POINT - DATA CODE G  
DATA COMMUNICATIONS ANALYST - SOC Code - 15-1081**

**20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES - The student will be able to:**

- 20.29 Participate in work-based learning experiences in a network support services environment.LA.C.3.4.
- 20.30 Discuss the use of technology in a network support services environment. LA.C.3.4.
- 20.32 Discuss the management/supervisors skills needed in a network support services environment.

**130.0 DEMONSTRATE A KNOWLEDGE OF GENERAL SECURITY CONCEPTS--The student will be able to:**

- 130.01 Describe access control.
- 130.02 Describe network authentication.
- 130.03 Understand the various types of network attacks (backdoors, DOS, spoofing, etc.)
- 130.04 Identify and modify non-essential services and protocols.
- 130.05 Identify malicious code (virus, worm, Trojan).
- 130.06 Configure system auditing, logging, and scanning as it relates to security procedures.

**131.0 DEVELOP AN AWARENESS OF COMMUNICATION SECURITY CONCEPTS--The student will be able to:**

- 131.05 Describe remote access protocols (VPN, RADIUS, L2TP, etc.).

- 131.06 Identify E-mail security concerns (hoaxes, spam, etc.).
- 131.07 Identify web (HTML) security concepts and designs (HTTP/S, IM, etc.).
- 131.08 Demonstrate an awareness of file transfer security concerns.
- 131.09 Describe and identify wireless networking security concerns and vulnerabilities.

**132.0 DEVELOP AN AWARENESS OF NETWORK INFRASTRUCTURE SECURITY—The student will be able to:**

- 132.16 Install and configure network firewalls.
- 132.17 Identify security concerns with various wiring media (copper, fiber).
- 132.18 Identify security concerns associated with removable media and storage devices.
- 132.19 Demonstrate an awareness of security topologies (security zones, Intranets, NAT, etc.).
- 132.20 Configure and use intrusion detection software.
- 132.21 Establish security baselines (updates, patches, hotfixes, Access Control lists, etc.).
- 132.22 Demonstrate the ability to configure a Virtual Private Network (VPN).
- 132.23 Describe the function of Network Address Translation (NAT).

**133.0 DEVELOP AN AWARENESS OF CRYPTOGRAPHY AND ITS RELATION TO SECURITY—The student will be able to:**

- 133.06 Demonstrate an understanding of security algorithms and encryption.
- 133.07 Use and apply Public Key Certificates.
- 133.08 Demonstrate an understanding of standards and protocols in commerce.

**134.0 INCORPORATE ORGANIZATIONAL AND OPERATIONAL SECURITY IN AN APPROPRIATE AND EFFECTIVE MANNER—The student will be able to:**

- 134.06 Describe how to establish a network security policy.
- 134.07 Explain the importance of physical security to protect network resources.
- 134.08 Identify and use disaster recovery procedures.
- 134.09 Describe the importance of business continuity and its relationship to network and corporate security.
- 134.10 Describe security policies and procedures that would be used in a business environment.
- 134.11 Explain the importance of privilege management (access, password management, sign-on, etc.).
- 134.12 Describe the concept of forensics as it applies to network security (obtaining evidence of security breaches).
- 134.13 Explain the importance of educating users and supervisors in regard to network security.
- 134.14 Create documentation that describes standards and guidelines for a network security system.

**Florida Department of Education  
STUDENT PERFORMANCE STANDARDS**

**Secondary Course Number:** 8209020  
**Course Title:** Computing for College and Careers  
**Course Credit:** 1

**COURSE DESCRIPTION:**

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society. This also includes proficiency with computers using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards. After successful completion of this core course, students will have met Occupational Completion Point - Data Code A, Information Technology Assistant, SOC Code 43- 4000.

**INFORMATION SYSTEMS**

02.0 DEMONSTRATE KNOWLEDGE, SKILL, AND APPLICATION OF INFORMATION SYSTEMS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data. (LA.B.1.4.3)
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks. (LA.B.2.4.4)
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software. (LA.B.2.4.4, LA.A.2.4.6)
- 01.05 Demonstrate basic computer file management skills. (LA.A.2.4.2, LA.B.2.4.4, LA.B.2.4.6)
- 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment. (LA.D.2.4.4)
- 01.07 Describe ethical issues and problems associated with computers and information systems.
- 01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

## **WORKPLACE COMMUNICATIONS**

02.0 DEMONSTRATE COMPREHENSION AND COMMUNICATION SKILLS-The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 USE TECHNOLOGY TO ENHANCE THE EFFECTIVENESS OF COMMUNICATION SKILLS-The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.  
(LA.B.1.4.1)
- 03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.  
(LA.B.1.4.1, LA.B.1.4.2, LA.B.1.4.3)
- 03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.  
(LA.B.2.4.1, LA.B.2.4.2)
- 03.05 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
- 03.06 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

## **MANAGEMENT**

04.0 DEVELOP AN AWARENESS OF MANAGEMENT FUNCTIONS AND ORGANIZATIONAL STRUCTURES AS THEY RELATE TO TODAY'S WORKPLACE AND EMPLOYER/EMPLOYEE ROLES-The student will be able to:

- 04.04 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
- 04.05 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
- 04.06 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 PRACTICE QUALITY PERFORMANCE IN THE LEARNING ENVIRONMENT AND THE WORKPLACE-The student will be able to:

- 05.03 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational

- skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
- 05.04 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 INCORPORATE APPROPRIATE LEADERSHIP AND SUPERVISION TECHNIQUES, CUSTOMER SERVICE STRATEGIES, AND STANDARDS OF PERSONAL ETHICS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 06.04 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
- 06.05 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
- 06.06 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

**MATHEMATICS AND FINANCE**

07.0 APPLY MATHEMATICAL OPERATIONS AND PROCESSES AS WELL AS FINANCIAL PLANNING STRATEGIES TO COMMONLY OCCURRING SITUATIONS IN THE WORKPLACE TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 07.04 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures. (MA.E.1.4.1, MA.E.A.4.2)
- 07.05 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time). (MA.B.3.4.1)
- 07.06 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate. (MA.A.3.4.3)

**JOB READINESS AND CAREER DEVELOPMENT**

08.0 ASSESS PERSONAL STRENGTHS AND WEAKNESSES AS THEY RELATE TO JOB OBJECTIVES, CAREER EXPLORATION, PERSONAL DEVELOPMENT, AND LIFE GOALS-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

10.0 INCORPORATE KNOWLEDGE GAINED FROM INDIVIDUAL ASSESSMENT AND JOB/CAREER EXPLORATION TO DESIGN AN INDIVIDUAL CAREER PLAN THAT REFLECTS THE TRANSITION FROM SCHOOL TO WORK, LIFELONG LEARNING, AND PERSONAL AND PROFESSIONAL GOALS-The student will be able to:

- 09.08 Analyze personal skills and aptitudes in comparison with various business related job and career options.

- 09.09 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.10 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up). (LA.C.3.4.4)
- 09.11 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.12 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.13 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.14 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

#### **HUMAN RELATIONS/INTERPERSONAL SKILLS**

- 10.0 DEMONSTRATE HUMAN RELATIONS/INTERPERSONAL SKILLS APPROPRIATE FOR THE WORKPLACE-The student will be able to:
  - 10.04 Accept constructive criticism. (SS.B.1.4.5)
  - 10.05 Apply appropriate strategies to manage and resolve conflicts in work situations. (LA.D.1.4.2, SS.B.1.4.5)
  - 10.06 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

#### **ADMINISTRATIVE PROCEDURES**

- 13.0 PERFORM FUNCTIONS AND RESPONSIBILITIES TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:
  - 13.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

#### **NETWORK/SOFTWARE SUPPORT**

- 41.0 PERFORM E-MAIL ACTIVITIES-The student will be able to:
  - 41.01 Describe e-mail capabilities and functions.
  - 41.09 Use the Internet to perform e-mail activities.
- 42.0 DEMONSTRATE OPERATING SYSTEMS-The student will be able to:
  - 42.01 Identify operating system file naming conventions.
  - 42.10 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
  - 42.12 Demonstrate a working knowledge of standard file formats.

42.14 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

**INFORMATION TECHNOLOGY**

67.0 DEVELOP AN AWARENESS OF EMERGING TECHNOLOGIES-The student will be able to:

67.01 Compare and contrast various methods of evaluation for emerging technologies.

67.02 Demonstrate knowledge of the process of planning upgrades and changeovers.

67.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

**Florida Department of Education  
STUDENT PERFORMANCE STANDARDS**

**Course Number:** 8207310  
**Course Title:** Introduction to Information Technology  
**Course Credit:** 1

**COURSE DESCRIPTION:**

This course is designed to provide an introduction to information technology concepts and careers as well as the impact information technology has on the world, people, and industry and basic web design concepts. The content includes information technology career research; operating systems and software applications; electronic communications including e-mail and Internet services; basic web commands and design; and emerging technologies. After successful completion of Introduction to Information Technology, students will have met Occupational Completion Point - Data Code A, General Office - OES 55321, SOC Code 43-9061.

**INFORMATION SYSTEMS**

03.0 DEMONSTRATE KNOWLEDGE, SKILL, AND APPLICATION OF INFORMATION SYSTEMS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.07 Describe ethical issues and problems associated with computers and information systems.

**WORKPLACE COMMUNICATIONS**

02.0 DEMONSTRATE COMPREHENSION AND COMMUNICATION SKILLS-The student will be able to:

- 02.03 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.62 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.63 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.64 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.65 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.66 Demonstrate an awareness of project management concepts and

tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 USE TECHNOLOGY TO ENHANCE THE EFFECTIVENESS OF COMMUNICATION SKILLS-  
The student will be able to:

03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.

03.06 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

#### **MANAGEMENT**

04.0 DEVELOP AN AWARENESS OF MANAGEMENT FUNCTIONS AND ORGANIZATIONAL STRUCTURES AS THEY RELATE TO TODAY'S WORKPLACE AND EMPLOYER/EMPLOYEE ROLES-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures. Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.

04.02 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 PRACTICE QUALITY PERFORMANCE IN THE LEARNING ENVIRONMENT AND THE WORKPLACE-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).

05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 INCORPORATE APPROPRIATE LEADERSHIP AND SUPERVISION TECHNIQUES, CUSTOMER SERVICE STRATEGIES, AND STANDARDS OF PERSONAL ETHICS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

06.03 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

#### **MATHEMATICS AND FINANCE**

07.0 APPLY MATHEMATICAL OPERATIONS AND PROCESSES AS WELL AS FINANCIAL PLANNING STRATEGIES TO COMMONLY OCCURRING SITUATIONS IN THE WORKPLACE TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

**JOB READINESS AND CAREER DEVELOPMENT**

08.0 ASSESS PERSONAL STRENGTHS AND WEAKNESSES AS THEY RELATE TO JOB OBJECTIVES, CAREER EXPLORATION, PERSONAL DEVELOPMENT, AND LIFE GOALS-The student will be able to:

- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 INCORPORATE KNOWLEDGE GAINED FROM INDIVIDUAL ASSESSMENT AND JOB/CAREER EXPLORATION TO DESIGN AN INDIVIDUAL CAREER PLAN THAT REFLECTS THE TRANSITION FROM SCHOOL TO WORK, LIFELONG LEARNING, AND PERSONAL AND PROFESSIONAL GOALS-The student will be able to:

- 09.15 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
- 09.16 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
- 09.17 Describe job requirements for the variety of occupations and professions within the global world of information technology.
- 09.18 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
- 09.19 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
- 09.20 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 DEMONSTRATE HUMAN RELATIONS/INTERPERSONAL SKILLS APPROPRIATE FOR THE WORKPLACE-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

**WORK-BASED LEARNING**

20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES-The student will be able to:

- 20.44 Participate in work-based learning experiences in an information technology environment.
- 20.46 Discuss the use of technology in an information technology environment.

#### **NETWORK/SOFTWARE SUPPORT**

- 41.0 PERFORM E-MAIL ACTIVITIES—The student will be able to:
  - 41.01 Describe e-mail capabilities and functions.
  - 41.02 Identify components of an e-mail message.
  - 41.03 Identify the components of an e-mail address.
  - 41.04 Identify when to use different e-mail options.
  - 41.05 Attach a file to an e-mail message.
  - 41.06 Forward an e-mail message.
  - 41.07 Use an address book.
  - 41.08 Reply to an e-mail message.
  - 41.09 Use the Internet to perform e-mail activities.
  - 41.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
  - 41.12 Identify when to include information from an original e-mail message in a response.
  - 41.13 Identify common problems associated with widespread use of e-mail.
- 42.0 DEMONSTRATE KNOWLEDGE OF DIFFERENT OPERATING SYSTEMS—The student will be able to:
  - 42.01 Identify operating system file naming conventions.
  - 42.10 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
  - 42.12 Demonstrate a working knowledge of standard file formats.
  - 42.14 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

#### **WEB DESIGN**

- 55.0 DEMONSTRATE PROFICIENCY NAVIGATING THE INTERNET, INTRANET, AND THE WWW—The student will be able to:
  - 55.01 Identify and describe Web terminology.
  - 55.10 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
  - 55.11 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
  - 55.14 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
  - 55.15 Trace the evolution of the Internet from its inception to the present and into the future.
  - 55.16 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
  - 55.17 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
  - 55.18 Identify effective Boolean search strategies.
- 56.0 DEMONSTRATE PROFICIENCY USING HTML COMMANDS—The student will be able to:
  - 56.01 Identify elements of a Web page.

- 56.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
- 56.03 Define basic HTML terminology.
- 56.04 Analyze HTML source code developed by others.
- 56.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, and tables).
- 56.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
- 56.08 Edit and test HTML documents for accuracy and validity.
- 56.17 Use basic functions of WYSIWYG editors.
- 56.18 Use basic functions of HTML, DHTML, and XML editors and converters.
- 56.19 Enhance web pages through the addition of images and graphics including animation.

57.0 DEMONSTRATE PROFICIENCY IN PAGE DESIGN APPLICABLE TO THE WWW-The student will be able to:

- 57.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
- 57.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
- 57.04 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD ROMs).
- 57.05 Use image design software to create and edit images.
- 57.25 Demonstrate proficiency in publishing to the Internet.
- 57.26 Demonstrate proficiency in adding downloadable forms to web pages.
- 57.27 Explain the need for web-based applications.

63.0 DEMONSTRATE PROFICIENCY USING SPECIALIZED WEB DESIGN SOFTWARE-The student will be able to:

- 63.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
- 63.02 Demonstrate use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

**INFORMATION TECHNOLOGY**

64.0 DEVELOP AN AWARENESS OF THE INFORMATION TECHNOLOGY INDUSTRY-The student will be able to:

- 64.01 Explain how information technology impacts the operation and management of business and society.
- 64.04 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
- 64.05 Explain the emergence of a paperless society.

65.0 DEVELOP AN AWARENESS OF MICROPROCESSORS AND DIGITAL COMPUTERS-The student will be able to:

- 65.01 Describe the evolution of the digital computer.
- 65.02 Explain the general architecture of a microcomputer system.
- 65.03 Explain the evolution of microprocessors.
- 65.04 Explain software hierarchy and its impact on microprocessors.
- 65.05 Explain the need for and use of peripherals.
- 65.06 Demonstrate proficiency using peripherals.
- 65.07 Identify the basic concepts of computer maintenance and upgrades.

65.08 Differentiate between diagnosing and troubleshooting.

66.0 DEVELOP AN AWARENESS OF PROGRAMMING LANGUAGES-The student will be able to:

66.01 Explain the history of programming languages.

66.02 Explain the need for and use of compilers.

66.03 Explain how compilers work.

66.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

67.0 DEVELOP AN AWARENESS OF EMERGING TECHNOLOGIES-The student will be able to:

67.01 Compare and contrast various methods of evaluation for emerging technologies.

67.02 Demonstrate knowledge of the process of planning upgrades and changeovers.

67.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

69.0 DEMONSTRATE AN UNDERSTANDING OF THE SEVEN LAYERS OF THE OPEN SYSTEMS INTERFACE (OSI) MODEL-The student will be able to:

69.01 Describe the evolution of OSI from its inception to the present and into the future.

69.02 Explain the interrelations of the seven layers of the Open Systems

Interface (OSI) as it relates to hardware and software.

69.04 Identify types of networks and how they work.

69.06 Identify the role of servers and clients on a network.

69.07 Identify benefits and risks of networked computing.

69.08 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).

69.09 Identify Intranets, Extranets and how they relate to the Internet.

69.11 Demonstrate basic understanding of network administration.

## **SOFTWARE APPLICATIONS**

70.0 DEMONSTRATE PROFICIENCY USING COMMON SOFTWARE APPLICATIONS-The student will be able to:

70.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

70.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

71.0 DEMONSTRATE PROFICIENCY USING SPECIALIZED SOFTWARE APPLICATIONS-The student will be able to:

71.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control,

- materials management, etc.).
- 71.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
- 71.06 Demonstrate the ability to incorporate digital sound.

July 2007

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

Secondary Course Number: 8207020  
Course Title: Networking 1  
Course Credit: 1

**COURSE DESCRIPTION:**

This course is designed to develop competencies needed for employment in network support positions. The content includes instruction in basic hardware configuration, hardware and software troubleshooting, operating systems, and computer networking. After successful completion of Networking 1, students will have met Occupational Completion Point - Data Code B, Computer Support Assistant - SOC Code - 15-1041

**MANAGEMENT**

**08.0 INCORPORATE APPROPRIATE LEADERSHIP AND SUPERVISION TECHNIQUES, CUSTOMER SERVICE STRATEGIES, AND STANDARDS OF PERSONAL ETHICS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:**

08.17 Develop strategies for resolving customer conflicts.

**NETWORK/SOFTWARE SUPPORT**

**30.0 IDENTIFY, INSTALL, CONFIGURE, AND UPGRADE DESKTOP AND SERVER COMPUTER MODULES AND PERIPHERALS, FOLLOWING ESTABLISHED BASIC PROCEDURES FOR SYSTEM ASSEMBLY AND DISASSEMBLY OF FIELD REPLACEABLE MODULES-the student will be able to:**

- 30.16 Identify and describe the functions of main processing boards (e.g., CPUs, RAM, ROM, bus architecture).
- 30.17 Identify and describe the functions of communication ports (e.g., serial and parallel ports).
- 30.18 Identify and describe the functions of peripheral devices (e.g., scanners, modems, hard drives, printers).
- 30.19 Identify and describe the components of portable systems (e.g., battery, LCD, AC adapter, PDAs).
- 30.20 Troubleshoot, install and upgrade computers and peripherals
- 30.21 Perform system hardware setup Demonstrate an understanding of input/output devices
- 30.22 Installation and configuration of applications software, hardware, and device drivers.
- 30.23 Demonstrate an understanding of the operation and purpose of hardware components
- 30.24 Install operating system software.

- 30.25 Customize operating systems.
- 30.26 Install application software.
- 30.27 Perform storage formatting and preparation activities.
- 30.28 Identify data measurement (e.g., bits, bytes, kilobytes).
- 30.29 Install and Configure RAID.
- 30.30 Recognize and report on server room environmental issues (temperature, humidity/ESD/power surges, back-up).

**31.0 DIAGNOSE AND TROUBLESHOOT COMMON MODULE PROBLEMS AND SYSTEM MALFUNCTIONS OF COMPUTER SOFTWARE, HARDWARE, PERIPHERALS, AND OTHER OFFICE EQUIPMENT--The student will be able to:**

- 31.10 Troubleshoot a personal computer system
- 31.11 Identify configuration problems.
- 31.12 Identify software problems.
- 31.13 Identify hardware malfunctions.
- 31.14 Identify network malfunctions
- 31.15 Resolve computer error messages.
- 31.16 Understand and troubleshoot memory and cache systems.
- 31.17 Verify that drives are the appropriate type.
- 31.18 Describe knowledge database search procedures used to identify possible solutions when troubleshooting software and hardware problems.

**32.0 IDENTIFY ISSUES, PROCEDURES AND DEVICES FOR PROTECTION WITHIN THE COMPUTING ENVIRONMENT, INCLUDING PEOPLE, HARDWARE AND THE SURROUNDING WORKSPACE--The student will be able to:**

- 32.06 Apply basic rules for hardware safety.
- 32.07 Demonstrate proficiency in basic preventative hardware maintenance.
- 32.08 Special disposal procedures that comply with environmental guidelines for batteries, CRTs, toner kits/cartridges, chemical solvents and cans, and MSDS.
- 32.09 Apply ergonomic principles applicable to the configuration of computer workstations.
- 32.10 Describe ethical issues and problems associated with computers and information systems.

**33.0 IDENTIFY SPECIFIC TERMINOLOGY, FACTS, WAYS AND MEANS OF DEALING WITH CLASSIFICATIONS, CATEGORIES AND PRINCIPLES OF MOTHERBOARDS, PROCESSORS AND MEMORY IN DESKTOP AND SERVER COMPUTER SYSTEMS--The student will be able to:**

- 33.04 Identify EDO RAM ,DRAM, SRAM, RIMM, VRAM, SDRAM, and WRAM.
- 33.05 Identify memory banks, memory chips (8-bit, 16-bit, and 32-bit), SIMMS (Single In-line Memory Module), DIMMS (Dual In-line Memory Module), parity chips versus non-parity chips.
- 33.06 Identify printer parallel port, COM/serial port, floppy drive, hard drive, Memory, and Boot sequence.

**34.0 DEMONSTRATE KNOWLEDGE OF BASIC TYPES OF PRINTERS, BASIC CONCEPTS, PRINTER COMPONENTS, HOW THEY WORK, HOW THEY PRINT ONTO A PAGE, PAPER PATH, CARE AND SERVICE TECHNIQUES, AND COMMON PROBLEMS--The student will be able to:**

- 34.01 Identify types of printers--laser, inkjet, dot matrix.
- 34.02 Identify care and service techniques and common problems with primary printer types.

34.03 Implement and manage printing on a network.

**35.0 IDENTIFY AND DESCRIBE BASIC NETWORK CONCEPTS AND TERMINOLOGY, ABILITY TO DETERMINE WHETHER A COMPUTER IS NETWORKED, KNOWLEDGE OF PROCEDURES FOR SWAPPING AND CONFIGURING NETWORK INTERFACE CARDS, AND KNOWLEDGE OF THE RAMIFICATIONS OF REPAIRS WHEN A COMPUTER IS NETWORKED**—The student will be able to:

- 35.01 Define networking and describe the purpose of a network.
- 35.02 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).
- 35.03 Describe the various types of network topologies.
- 35.04 Identify and describe the purpose of standards, protocols, and the Open Systems Interconnection (OSI) reference model.
- 35.05 Configure network and verify network connectivity.
- 35.06 Discuss the responsibilities of the network administrator (e.g., rights and responsibilities).
- 35.07 Develop user logon procedures.
- 35.08 Utilize network management infrastructures (e.g., network monitoring, alerting, security) to perform administrative tasks.
- 35.09 Identify common backup strategies and procedures.
- 35.10 Select and use appropriate electronic communications software and hardware for specific tasks.
- 35.11 Compare and contrast Internet software and protocols.
- 35.12 Diagnose and resolve electronic communications operational problems.
- 35.13 Design and implement directory tree structures.
- 35.14 Install services tools (SNMP, backup software)
- 35.15 Perform full backup and verify backup
- 35.16 Identify bottlenecks (e.g., processor, bus transfer, I/O, disk I/O, network I/O, memory).
- 35.17 Use the concepts of fault tolerance/fault recovery to create a disaster recovery plan.
- 35.18 Document and test disaster recovery plan regularly, and update as needed.

**36.0 PERFORM END USER SUPPORT AND ASSISTANCE BY TROUBLESHOOTING AND DIAGNOSING THROUGH TELEPHONE, E-MAIL, INTERNET, REMOTE ACCESS, OR DIRECT CONTACT**—The student will be able to:

- 36.01 Apply call center vocabulary.
- 36.02 Listen and input information simultaneously.
- 36.03 Apply first response assistance for minor repair work.

**38.0 DEMONSTRATE PROFICIENCY USING GRAPHICAL USER INTERFACE (GUI) OPERATING SYSTEMS**—The student will be able to:

- 38.11 Identify parts of GUI windows.
- 38.12 Create and use icons.
- 38.13 Demonstrate proficiency in using menu systems.
- 38.14 Demonstrate proficiency in using pointing and selection devices.
- 38.15 Identify keyboard shortcuts and special function keys.

- 38.16 Demonstrate proficiency in manipulating windows.
- 38.17 Utilize help systems and hypertext links.
- 38.18 Create, organize, and maintain file system directories.
- 38.19 Organize desktop objects.
- 38.20 Run multiple applications.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

Secondary Course Number: 8207441  
Course Title: Networking 2, Administration  
Course Credit: 1

**COURSE DESCRIPTION:**

This course is designed to provide individuals with the knowledge necessary to understand and identify the tasks involved in supporting operating system within a large networking environment. After successful completion of Networking 1 and 2 Administration, students will have met Occupational Completion Point - Data Code C - Network Support Technician SOC code 12-1070

**MANAGEMENT**

08.0 INCORPORATE APPROPRIATE LEADERSHIP AND SUPERVISION TECHNIQUES, CUSTOMER SERVICE STRATEGIES, AND STANDARDS OF PERSONAL ETHICS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE—THE STUDENT WILL BE ABLE TO:

08.18 Develop diplomatic methods to communicate with customers.

**WORK-BASED LEARNING**

20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES—The student will be able to:

20.29 Participate in work-based learning experiences in a network support services environment. LA.C.3.4

20.30 Discuss the use of technology in a network environment. LA.C.3.4.

**NETWORK/SOFTWARE SUPPORT**

37.0 PERFORM END USER SUPPORT AND ASSISTANCE BY TROUBLESHOOTING AND DIAGNOSING THROUGH TELEPHONE, E-MAIL, REMOTE ACCESS, OR DIRECT CONTACT—The student will be able to:

37.09 Apply first response assistance for minor repair work.

40.0 PERFORM INSTALLATION AND CONFIGURATION ACTIVITIES—The student will be able to:

40.11 Configure the operating system environment.

40.12 Connect client workstation running similar operating system to the network.

40.13 Configure Internet access for a network.

40.14 Configure a Web server.

40.15 Use remote server to deploy operating system.

40.16 Troubleshoot failed installations.

40.17 Install and configure network services for interoperability.

40.18 Monitor, configure troubleshoot and control access to printers.

- 40.19 Monitor, configure troubleshoot and control access to files, folders, and shared folders.
- 40.20 Monitor, configure troubleshoot and control access to Web sites.

**41.0 DEMONSTRATE PROFICIENCY USING COMPUTER NETWORKS--The student will be able to:**

- 41.02 Identify and describe the purpose of standards, protocols, and the Open Systems Interconnection (OSI) reference model.

**42.0 DEMONSTRATE PROFICIENCY IN CONFIGURING AND TROUBLESHOOTING HARDWARE DEVICES AND DRIVERS-- The student will be able to:**

- 42.05 Configure hardware devices.
- 42.06 Configure driver signing options.
- 42.07 Update device drivers.
- 42.08 Troubleshoot problems with hardware.

**43.0 DEMONSTRATE PROFICIENCY IN MANAGING, MONITORING, AND OPTIMIZING SYSTEM PERFORMANCE, RELIABILITY AND AVAILABILITY--The student will be able to:**

- 43.06 Monitor and optimize usage of system resources.
- 43.07 Manage processes.
- 43.08 Optimize disk performance.
- 43.09 Manage and optimize availability of system data and user data.
- 43.10 Recover systems and user data.

**44.0 DEMONSTRATE PROFICIENCY IN MANAGING, CONFIGURING AND TROUBLESHOOTING STORAGE USE--The student will be able to:**

- 44.07 Configure and manage user profiles.
- 44.08 Monitor, configure and troubleshoot disks and volumes.
- 44.09 Configure data compression.
- 44.10 Monitor and configure disk quotas.
- 44.11 Recover from disk failures.

**45.0 DEMONSTRATE PROFICIENCY IN CONFIGURING AND TROUBLESHOOTING NETWORK CONNECTIONS--The student will be able to:**

- 45.09 Install, configure and troubleshoot shared access.
- 45.10 Install, configure and troubleshoot a virtual private network.
- 45.11 Install, configure and troubleshoot network protocols.
- 45.12 Install and configure network services.
- 45.13 Configure, monitor and troubleshoot remote access.
- 45.14 Install, configure, monitor, and troubleshoot Terminal Services.
- 45.15 Configure the properties of a connection.
- 45.16 Install, configure, and troubleshoot network adapters and drivers.

**46.0 DEMONSTRATE PROFICIENCY IN IMPLEMENTING, MONITORING, AND TROUBLESHOOTING SECURITY--The student will be able to:**

- 46.08 Encrypt data on a hard disk by using Encrypting File System.

- 46.09 Implement, configure, manage and troubleshoot policies in an operating system environment.
- 46.10 Implement, configure, manage and troubleshoot auditing.
- 46.11 Implement, configure, manage and troubleshoot local accounts.
- 46.12 Implement, configure, manage and troubleshoot account policy.
- 46.13 Implement, configure, manage and troubleshoot security by using the Security Configuration Tool Set.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

Secondary Course Number: 8207442  
Course Title: Networking 3, Administration  
Course Credit: 1

**COURSE DESCRIPTION:**

This course continues the study of network support services. The content includes the planning, implementation, and management of server and client operating systems in a networking environment. After successful completion of this course, students will have met Occupational Completion Point - Data Code D, Systems Administrator. SOC Code 15-1031

**MANAGEMENT**

08.0 INCORPORATE APPROPRIATE LEADERSHIP AND SUPERVISION TECHNIQUES, CUSTOMER SERVICE STRATEGIES, AND STANDARDS OF PERSONAL ETHICS TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE—The student will be able to:

08.18 Develop diplomatic methods to communicate with customers, clients, and end-users of information technology services.

**WORK-BASED LEARNING**

20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES - The student will be able to:

20.29 Participate in work-based learning experiences in a network support services environment.

20.30 Discuss the use of technology in a network support services environment.

20.32 Discuss the management/supervisors skills needed in a network support services environment.

**NETWORK/SOFTWARE SUPPORT**

50.0 ADMINISTER ACCOUNTS AND RESOURCES ON COMPUTERS RUNNING SERVER OPERATING SYSTEM SOFTWARE IN A NETWORKED ENVIRONMENT—The student will be able to:

50.07 Describe features of server operating system.

50.08 Log on to the server operating system.

50.09 Install and configure administrative tools.

50.10 Create user accounts.

50.11 Create computer accounts.

50.12 Create an organizational unit.

- 51.0 MODIFY USER AND COMPUTER ACCOUNTS ON COMPUTERS RUNNING A SERVER OPERATING SYSTEM IN A NETWORKED ENVIRONMENT—The student will be able to:
- 51.08 Modify user and computer account properties.
  - 51.09 Enable and unlock user and computer accounts.
  - 51.10 Create a user account template.
  - 51.11 Locate user and computer accounts in a global directory structure.
  - 51.12 Save queries.
  - 51.13 Reset user and computer accounts.
  - 51.14 Move domain objects.
- 52.0 PERFORM VARIOUS ADMINISTRATIVE FUNCTIONS USING GROUPS—The student will be able to:
- 52.06 Create groups.
  - 52.07 Manage group membership
  - 52.08 Apply strategies for using groups
  - 52.09 Modify groups.
  - 52.10 Manage default groups.
- 53.0 ENABLE RESOURCE ACCESS WITH PERMISSIONS, MANAGE ACCESS TO FILES AND FOLDERS USING PERMISSIONS, AND MANAGE PERMISSION INHERITANCE—The student will be able to:
- 53.06 Manage access to resources.
  - 53.07 Manage access to shared folders.
  - 53.08 Manage access to files and folders by using file system permissions.
  - 53.09 Determine effective permissions.
  - 53.10 Manage access to shared files by using offline caching.
- 54.0 IMPLEMENT PRINTING IN A NETWORKED ENVIRONMENT UTILIZING A PARTICULAR SERVER OPERATING SYSTEM—The student will be able to:
- 54.05 Install and share printers.
  - 54.06 Manage access to printers by using shared printer permissions.
  - 54.07 Manage printer drivers.
  - 54.08 Implement printer locations.
- 55.0 SET UP A NETWORK-WIDE PRINTING STRATEGY TO MEET THE NEEDS OF USERS AND TROUBLESHOOT INSTALLATION OR CONFIGURATION PROBLEMS—The student will be able to:
- 55.05 Change the location of the print spooler.
  - 55.06 Set printing priorities.
  - 55.07 Schedule printer availability.
  - 55.08 Configure a printing tool.
- 56.0 UTILIZE AVAILABLE PERMISSIONS FOR MANAGING ACCESS TO GLOBAL DIRECTORY OBJECTS, HOW TO MOVE OBJECTS BETWEEN ORGANIZATIONAL UNITS IN THE SAME DOMAIN, AND HOW TO DELEGATE CONTROL OF AN ORGANIZATIONAL UNIT—The student will be able to:
- 56.04 Identify the role of organizational units.

- 56.05 Modify permissions for global directory objects.
- 56.06 Delegate control of organizational units.

**57.0 USE GROUP POLICY TO CONFIGURE FOLDER REDIRECTION, BROWSER CONNECTIVITY, AND THE DESKTOP—The student will be able to:**

- 57.04 Configure group policy settings.
- 57.05 Assign scripts with group policy.
- 57.06 Configure folder redirection.

**58.0 MANAGE COMPUTER SECURITY IN A SECURITY IN A NETWORKING ENVIRONMENT—The student will be able to:**

- 58.06 Describe the security features a server operating system.
- 58.07 Use security templates to secure computers.
- 58.08 Test computer security policy.
- 58.09 Configure auditing.
- 58.10 Manage security logs.

**59.0 ADMINISTER SERVERS REMOTELY—The student will be able to:**

- 59.04 Explain the tasks, tools, and rights that are required to administer a server.
- 59.05 Configure remote access for administration and client preferences.
- 59.06 Manage remote desktop connections.

**60.0 MONITOR SERVER PERFORMANCE BY USING PERFORMANCE TOOLS, CONFIGURE AND MANAGE PERFORMANCE LOGS, CONFIGURE AND MANAGE ALERTS, AND MANAGE SYSTEM MONITOR VIEWS—The student will be able to:**

- 60.05 Establish a performance baseline.
- 60.06 Perform real-time and logged monitoring.
- 60.07 Configure and manage counter logs.
- 60.08 Configure alerts.

**61.0 COLLECT PERFORMANCE DATA BY MONITORING PRIMARY SERVER SUBSYSTEMS AND IDENTIFY SYSTEM BOTTLENECKS BY USING THE PERFORMANCE MONITORING SOFTWARE—The student will be able to:**

- 61.08 Explain how the four primary server subsystems affect server performance.
- 61.09 Monitor server memory.
- 61.10 Monitor processor usage.
- 61.11 Monitor disks.
- 61.12 Monitor network usage.
- 61.13 Identify the guidelines for using counters and thresholds.
- 61.14 Describe the best practices for monitoring server performance.

**62.0 MAINTAINING DEVICE DRIVERS—The student will be able to:**

- 62.03 Configure device driver signing.
- 62.04 Restore the previous version of a device driver.

**63.0 USE SOFTWARE TOOLS TO MANAGE AND SET UP DISKS—The student will be able to:**

- 63.07 Initialize and partition a disk.
- 63.08 View and update disk properties.
- 63.09 Manage mounted drives.
- 63.10 Create volumes on a disk.
- 63.11 Convert a disk from basic to dynamic and from dynamic to basic.
- 63.12 Import disks.

**64.0 USE FILE ENCRYPTION FOR SECURITY OF DATA—The student will be able to:**

- 64.04 Manage disk based file compression.
- 64.05 Configure file encryption.
- 64.06 Implement disk quotas.

**65.0 PLAN FOR A COMPUTER DISASTER AND USE THE FEATURES OF A SERVER OPERATING SYSTEM TO PREVENT A DISASTER OR RECOVER WHEN ONE OCCURS—The student will be able to:**

- 65.08 Prepare for disaster recovery.
- 65.09 Back up data.
- 65.10 Schedule backup jobs.
- 65.11 Restore data.
- 65.12 Configure a shadow copy.
- 65.13 Recover from server failure.
- 65.14 Select a disaster recovery method.

**66.0 MANAGE AND DISTRIBUTE CRITICAL SOFTWARE UPDATES THAT RESOLVE KNOWN SECURITY VULNERABILITIES AND OTHER STABILITY ISSUES—The student will be able to:**

- 66.04 Install and configure client computers to use receive software updates.
- 66.05 Install and configure servers to use perform software updates.
- 66.06 Manage the Software Update Services infrastructure.

**67.0 CONSTRUCT AND ASSIGN IP ADDRESSES AND ISOLATE ADDRESSING ISSUES ASSOCIATED WITH THE IP ROUTING PROCESS—The student will be able to:**

- 67.01 Convert IP Addresses from decimal to binary.
- 67.02 Calculate a subnet mask.
- 67.03 Create subnets using VLSM and CIDR.
- 67.04 Isolate addressing issues associated with the IP routing process.

**68.0 CONFIGURE AN INTERNET PROTOCOL (IP) ADDRESS FOR CLIENT COMPUTERS—The student will be able to:**

- 68.01 Configure a client to use a static IP address.
- 68.02 Configure a client to obtain an IP address automatically by using DHCP.
- 68.03 Configure a client to obtain an IP address automatically by using Alternate Configuration.

**69.0 CONFIGURE NAME RESOLUTION MECHANISMS FOR CLIENTS ON A NETWORK AND DESCRIBE THE NAME RESOLUTION PROCESS—The student will be able to:**

- 69.01 Use ARP to identify client media access control (MAC) addresses.
- 69.02 Describe the function of Network Basic Input/Output System (NetBIOS).
- 69.03 Configure a client to use a static IP address.
- 69.04 Configure a client to use name resolution servers.

**70.0 ISOLATE COMMON CONNECTIVITY ISSUES AND DESCRIBE HOW TO USE UTILITIES AND TOOLS AS PART OF THIS PROCESS—The student will be able to:**

- 70.01 Isolate common connectivity issues.
- 70.02 Use a flow chart to isolate a problem.
- 70.03 Use utilities and tools to isolate a problem

**71.0 CONFIGURE A ROUTING SOLUTION FOR A NETWORK ENVIRONMENT—The student will be able to:**

- 71.01 Describe the role of routing in the network infrastructure.
- 71.02 Enable and configure the Routing and Remote Access service.
- 71.03 Configure packet filters.

**72.0 ALLOCATE IP ADDRESSING IN A NETWORK ENVIRONMENT—The student will be able to:**

- 72.01 Describe the role of DHCP in the network infrastructure.
- 72.02 Add and authorize a DHCP Server service.
- 72.03 Configure a DHCP scope.
- 72.04 Configure DHCP options.
- 72.05 Configure a DHCP reservation.
- 72.06 Configure a DHCP relay agent.

**73.0 MANAGE THE DHCP SERVICE TO REFLECT CHANGING CLIENT IP ADDRESSING NEEDS AND MONITOR DHCP SERVER PERFORMANCE—The student will be able to:**

- 73.01 Manage a DHCP database.
- 73.02 Monitor DHCP.
- 73.03 Apply security guidelines for DHCP.

**74.0 ASSIGN COMPUTER NAMES TO THE IP ADDRESSES OF THE SOURCE AND DESTINATION HOSTS, AND THEN USE THE COMPUTER NAME TO CONTACT THE HOSTS—The student will be able to:**

- 74.01 Describe the name resolution process.
- 74.02 View names on a client.
- 74.03 Configure host name resolution.

**75.0 RESOLVE HOST NAMES BY USING DOMAIN NAME SYSTEM—The student will be able to:**

- 75.01 Describe the role of DNS in the network infrastructure.
- 75.02 Install the DNS Server service.
- 75.03 Configure the properties for the DNS Server service.
- 75.04 Configure the DNS zones.
- 75.05 Configure DNS zone transfers.
- 75.06 Configure dynamic updates.
- 75.07 Configure a DNS client.
- 75.08 Delegate authority for zones.

- 76.0 MANAGE AND MONITOR DNS SERVERS TO ENSURE THAT THEY ARE FUNCTIONING PROPERLY AND TO OPTIMIZE NETWORK PERFORMANCE—The student will be able to:**
- 76.01 Configure the Time-to-Live (TTL) value.
  - 76.02 Configure aging and scavenging.
  - 76.03 Integrate DNS with WINS.
  - 76.04 Test the DNS server configuration.
  - 76.05 Monitor DNS server performance.
- 77.0 CONFIGURE A SERVER WITH THE ROUTING AND REMOTE ACCESS SERVICE, CREATE APPROPRIATE REMOTE ACCESS CONNECTIONS ON A NETWORK ACCESS SERVER, AND CONFIGURE USERS' ACCESS RIGHTS—The student will be able to:**
- 77.01 Describe a network access infrastructure.
  - 77.02 Configure a virtual private network (VPN) connection.
  - 77.03 Configure a dial-up connection.
  - 77.04 Configure a wireless connection.
  - 77.05 Control remote user access to a network.
  - 77.06 Centralize authentication and policy management for network access by using Internet Authentication Service (IAS).
- 78.0 MANAGE AND MONITOR NETWORK ACCESS AND THE NETWORK ACCESS SERVICES—The student will be able to:**
- 78.01 Configure logging on the network access server.
  - 78.02 Collect and monitor network access data.
- 79.0 PERFORM INSTALLATION OF A NETWORK CLIENT OPERATING SYSTEM—The student will be able to:**
- 79.01 Plan a client operating system installation.
  - 79.02 Install a client operating system.
  - 79.03 Upgrade a client operating system from an earlier version.
  - 79.04 Automate the installation process for a client operating system.
- 80.0 INSTALL AND CONFIGURE HARDWARE DEVICES—The student will be able to:**
- 80.01 Configure hardware devices and drivers on a computer running a client OS.
  - 80.02 Add and remove devices by using built in utilities and wizards
  - 80.03 Restore device drivers.
- 81.0 CONFIGURE AND MANAGE FILE SYSTEMS—The student will be able to:**
- 81.01 Work with file systems.
  - 81.02 Manage data compression.
  - 81.03 Secure data by using EFS.
  - 81.04 Configure disk compression.
  - 81.05 Secure files by using EFS.
- 82.0 TROUBLESHOOT THE BOOT PROCESS AND OTHER SYSTEM ISSUES—The student will be able to:**

- 82.01 Examine the boot process.
- 82.02 Control system settings during the boot process.
- 82.03 Change startup behavior.
- 82.04 Use advanced boot options to troubleshoot startup problems.
- 82.05 Restore a computer to a previous state.
- 82.06 Troubleshoot the boot process and other system issues.

**83.0 CONFIGURE THE DESKTOP—The student will be able to:**

- 83.01 Configure user desktop settings.
- 83.02 Customize the desktop environment.
- 83.03 Configure system settings.
- 83.04 Describe how user profiles and group policy affect desktop customization.

**84.0 CONFIGURE IP ADDRESSES AND NAME RESOLUTION—The student will be able to:**

- 84.01 Configure IP addresses.
- 84.02 Troubleshoot IP addresses.
- 84.03 Determine TCP/IP name resolution methods.
- 84.04 Configure a DNS and WINS client.
- 84.05 Connect to a remote host.
- 84.06 Configure IP addresses.
- 84.07 Configure the DNS client.

**85.0 CONFIGURE THE CLIENT TO WORK IN A NETWORK ENVIRONMENT—The student will be able to:**

- 85.01 Examine workgroups and user accounts.
- 85.02 Create and authenticate local user accounts.
- 85.03 Configure local security.
- 85.04 Configure logon options.
- 85.05 Configure networking.
- 85.06 Join a domain.
- 85.07 Operate in a domain.

**86.0 SUPPORT REMOTE USERS—The student will be able to:**

- 86.01 Establish remote access connections.
- 86.02 Connect to Virtual Private Networks.
- 86.03 Configure inbound connections.
- 86.04 Configure authentication protocols and encryption.
- 86.05 Using remote desktop.
- 86.06 Store user names and passwords to facilitate remote connections.
- 86.07 Configure a VPN connection.
- 86.08 Configure and using remote desktop.
- 86.09 Store user names and passwords.

**87.0 CONFIGURE A CLIENT OS FOR MOBILE COMPUTING—The student will be able to:**

- 87.01 Configure hardware for mobile computing.
- 87.02 Configure power management options for mobile computing.
- 87.03 Make files, folders, and web pages available for offline use.

**88.0 MONITOR RESOURCES AND PERFORMANCE—The student will be able to:**

- 88.01 Determine system information.
- 88.02 Use task manager to monitor system performance.
- 88.03 Use performance and maintenance tools to improve performance.
- 88.04 Monitor event logs.
- 88.05 Configure program compatibility.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

Secondary Course Number: 8207443  
Course Title: Networking 4, Administration  
Course Credit: 1

**COURSE DESCRIPTION:**

This course continues the study of network support services. The content includes the planning, implementation, and management of server and client operating systems in a networking environment. After successful completion of this course, students will have met Occupational Completion Point – Data Code E, Systems Engineer. SOC Code 15-1032

**02.0 APPLY COMMUNICATION SKILLS (READING, WRITING, SPEAKING, LISTENING, AND VIEWING) IN A COURTEOUS, CONCISE, AND CORRECT MANNER ON PERSONAL AND PROFESSIONAL LEVELS—The student will be able to:**

02.19 Communicate technical information in a concise, understandable manner to a non-technical audience both verbally and in writing.

**20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES—The student will be able to:**

20.29 Participate in work-based learning experiences in a network support services environment.  
20.30 Discuss the use of technology in a network support services environment.  
20.31 Compare and contrast the software applications used in a network support services environment.

**90.0 PLAN A NETWORK INFRASTRUCTURE—The student will be able to:**

90.01 Explain how to plan a network.  
90.02 Explain how to prepare development and test environments.  
90.03 Explain the concepts of managing and maintaining a network environment by using specific tools.  
90.04 Explain the technologies and services implemented in a network.

**91.0 PLAN AND OPTIMIZE A TCP/IP PHYSICAL AND LOGICAL NETWORK—The student will be able to:**

91.01 Discuss TCP/IP.  
91.02 Plan a TCP/IP addressing scheme.  
91.03 Optimize network performance.

**92.0 PLAN AND TROUBLESHOOT ROUTING—The student will be able to:**

92.01 Describe how routing works.  
92.02 Create a secure routing plan.  
92.03 Identify TCP/IP routing trouble shooting tools.  
92.04 Troubleshoot TCP/IP routing.

- 93.0 PLAN A DHCP STRATEGY—The student will be able to:**
- 93.01 Demonstrate how DHCP operates in an enterprise environment.
  - 93.02 Plan a DHCP strategy.
  - 93.03 Secure a DHCP strategy.
- 94.0 PLAN A DNS STRATEGY—The student will be able to:**
- 94.01 Plan a namespace strategy.
  - 94.02 Plan zones.
  - 94.03 Plan zone replication.
  - 94.04 Plan a DNS server implementation.
- 95.0 OPTIMIZE AND TROUBLESHOOT DNS—The student will be able to:**
- 95.01 Optimize a DNS server.
  - 95.02 Optimize the DNS server-to-server communications.
  - 95.03 Optimize DNS client support traffic.
  - 95.04 Troubleshoot host name resolution.
- 96.0 PLAN AND TROUBLESHOOT IPSEC—The student will be able to:**
- 96.01 Discuss IPsec.
  - 96.02 Understand IPsec default policies, rules, and settings.
  - 96.03 Plan IPsec deployment.
  - 96.04 Troubleshoot IPsec.
- 97.0 PLAN A NETWORK ACCESS—The student will be able to:**
- 97.01 Select appropriate connection methods for a network access strategy.
  - 97.02 Select a remote access policy strategy.
  - 97.03 Select a network access authentication method.
  - 97.04 Plan a network access strategy.
- 98.0 TROUBLESHOOT NETWORK ACCESS—The student will be able to:**
- 98.01 Identify network access troubleshooting resources.
  - 98.02 Troubleshoot network authentication.
  - 98.03 Troubleshoot LAN authentication.
  - 98.04 Troubleshoot remote access.
- 99.0 ANALYZE GLOBAL DIRECTOR INFRASTRUCTURE—The student will be able to:**
- 99.01 Describe the architecture of global directory.
  - 99.02 Describe the working of global directory.
  - 99.03 Use administrative tools to examine the components of global directory.
  - 99.04 Describe the global directory design, planning, and implementation processes.
- 100.0 IMPLEMENT A GLOBAL DIRECTORY STRUCTURE AND DOMAIN STRUCTURE—The student will be able to:**
- 100.01 Create a forest and domain structure.
  - 100.02 Configure DNS in a global directory environment.
  - 100.03 Raise the functional level of a forest and a domain.
  - 100.04 Create trust relationships between domains.

100.05 Secure trusts by using SID filtering.

**101.0 IMPLEMENT AN ORGANIZATIONAL UNIT STRUCTURE—The student will be able to:**

- 101.01 Create an organizational unit.
- 101.02 Delegate control for an organizational unit.
- 101.03 Plan an organization unit strategy.

**102.0 IMPLEMENT USER, GROUP, AND COMPUTER ACCOUNTS—The student will be able to:**

- 102.01 Describe the types of global directory accounts and groups.
- 102.02 Create multiple user and computer accounts.
- 102.03 Implement UPN suffixes.
- 102.04 Move objects within a domain and across domains in a global structure.
- 102.05 Plan a strategy for user computer and group accounts.
- 102.06 Plan a global directory audit strategy.

**103.0 IMPLEMENT GROUP POLICY—The student will be able to:**

- 103.01 Create and configure group policy objects.
- 103.02 Manage group policy objects.
- 103.03 Verify and troubleshoot group policies.
- 103.04 Delegate administrative control of group policies.
- 103.05 Plan a group policies strategy for the enterprise.

**104.0 DEPLOY AND MANAGE SOFTWARE BY USING GROUP POLICIES—The student will be able to:**

- 104.01 Explain the basic concepts of software deployment by using group policies.
- 104.02 Deploy software by using group policies.
- 104.03 Configure software deployment by using group policies.
- 104.04 Maintain deployed software by using group policies.
- 104.05 Troubleshoot some common problems with software deployment.
  
- 104.06 Plan a software deployment strategy.

**105.0 IMPLEMENT SITES TO MANAGE GLOBAL DIRECTORY REPLICATION—The student will be able to:**

- 105.01 Explain the components and the process of replication.
- 105.02 Create and configure sites.
- 105.03 Manage a global directory site topology.
- 105.04 Monitor and troubleshoot global directory replication failures.
- 105.05 Plan a site strategy.

**106.0 IMPLEMENT PLACEMENT OF DOMAIN CONTROLLERS—The student will be able to:**

- 106.01 Implement a global catalog in a global directory.
- 106.02 Determine the placement of domain controllers in a global directory.
- 106.03 Create a plan for placing domain controllers in a global directory.

**107.0 USE A FRAMEWORK FOR DESIGNING SECURITY AND CREATE A SECURITY DESIGN TEAM—The student will be able to:**

- 107.01 Describe common elements of security policies and procedures.
- 107.02 Create a security design framework.
- 107.03 Create a security design team.

**108.0 RECOGNIZE AND PREDICT COMMON THREATS BY USING A THREAT MODEL—The student will be able to:**

- 108.01 Explain common network vulnerabilities and how attackers can exploit them.
- 108.02 Predict threats to security by using the STRIDE (Spoofing, Tampering, Repudiation, Information disclosure, Denial of service, and Elevation of privilege) threat model.

**109.0 APPLY A FRAMEWORK FOR PLANNING RISK MANAGEMENT—The student will be able to:**

- 109.01 Explain the purpose and operation of risk management.
- 109.02 Draft the elements of a risk management plan.

**110.0 DESIGN SECURITY FOR PHYSICAL RESOURCES—The student will be able to:**

- 110.01 Determine threats and analyze risks to physical resources.
- 110.02 Design security for physical resources.

**111.0 DESIGN SECURITY FOR COMPUTERS—The student will be able to:**

- 111.01 Determine threats and analyze risks to computers.
- 111.02 Design security for computers.

**112.0 DESIGN SECURITY FOR ACCOUNTS—The student will be able to:**

- 112.01 Determine threats and analyze risks to accounts.
- 112.02 Design security for accounts.

**113.0 DESIGN SECURITY FOR AUTHENTICATION—The student will be able to:**

- 113.01 Determine threats and analyze risks to authentication.
- 114.02 Design security for authentication.

**114.0 DESIGN SECURITY FOR DATA—The student will be able to:**

- 114.01 Determine threats and analyze risks to data.
- 114.02 Design security for data.

**115.0 DESIGN SECURITY FOR DATA TRANSMISSION—The student will be able to:**

- 115.01 Determine threats and analyze risks to data transmission.
- 115.02 Design security for data transmission.

**116.0 DESIGN SECURITY FOR NETWORK PERIMETERS—The student will be able to:**

- 116.01 Determine threats and analyze risks to network perimeters.
- 116.02 Design security for **network perimeters**.

117.0 DESIGN AN AUDIT POLICY AND AN INCIDENT RESPONSE PROCEDURE—The student will be able to:

- 117.01 Explain the importance of auditing and incident response.
- 117.02 Design an auditing policy.
- 117.03 Design an incident response procedure.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

Secondary Course Number: 8207060  
Course Title: Networking 5  
Course Credit: 1

**COURSE DESCRIPTION:**

This course continues the study of network support services. The content includes wireless networking technologies, implementation, management and security. After successful completion of Networking 5, students will have met Occupational Completion Point - Data Code F, Wireless Network Specialist. SOC Code 15-1080

**WORK-BASED LEARNING**

**20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES - The student will be able to:**

- 20.29 Participate in work-based learning experiences in a network support services environment. LA.C.3.4
- 20.30 Discuss the use of technology in a network support services environment. LA.C.3.4
- 20.32 Discuss the management/supervisory skills needed in a network support service environment.

**120.0 DEMONSTRATE PROFICIENCY IN APPLYING RADIO FREQUENCY (RF) TECHNOLOGIES—The student will be able to:**

- 120.01 Define and apply the basic concepts of RF behavior.
- 120.02 Understand the applications of basic RF antenna concepts.
- 120.03 Understand and apply the basic components of RF mathematics.
- 120.04 Identify some of the different uses for spread spectrum technologies.
- 120.05 Comprehend the differences between, and apply the different types of spread spectrum technologies.
- 120.06 Identify and apply the concepts which make up the functionality of spread spectrum technology.
- 120.07 Identify the laws set forth by the FCC that govern spread spectrum technology, including power outputs, frequencies, bandwidths, hop times, and dwell times.

**121.0 DEVELOP AN AWARENESS OF WIRELESS LAN TECHNOLOGIES—The student will be able to:**

- 121.01 Identify and apply the processes involved in authentication and association.
- 121.02 Recognize the concepts associated with wireless LAN service sets.
- 121.03 Understand the implications of the following power management features of wireless LANs.
- 121.04 Specify the modes of operation involved in the movement of data traffic across wireless LANs.

**122.0 PERFORM IMPLEMENTATION AND MANAGEMENT ACTIVITIES--The student will be able to:**

- 122.01 Identify the technology roles for which wireless LAN technology is an appropriate technology application.
- 122.02 Identify the purpose of infrastructure devices and explain how to install, configure, and manage them.
- 122.03 Identify the purpose of wireless LAN client devices and explain how to install, configure, and manage them.
- 122.04 Identify the purpose of wireless LAN gateway devices and explain how to install, configure, and manage them.
- 122.05 Identify the basic attributes, purpose, and function of types of antennas.
- 122.06 Describe the proper locations and methods for installing antennas.
- 122.07 Explain the concepts of polarization, gain, beamwidth, and free-space path loss as they apply to implementing solutions that require antennas.
- 122.08 Identify the use of wireless LAN accessories and explain how to install, configure, and manage them.
- 122.09 Identify, understand, correct or compensate for wireless LAN implementation challenges.
- 122.10 Explain how antenna diversity compensates for multipath.
- 122.11 Identify and understand the importance and process of conducting a thorough site survey.
- 122.12 Identify and understand the importance of the necessary tasks involved in preparing to do an RF site survey.
- 122.13 Identify the necessary equipment involved in performing a site survey.
- 122.14 Understand the necessary procedures involved in performing a site survey.
- 122.15 Identify and understand site survey reporting procedures.

**123.0 DEVELOP AN AWARENESS OF WIRELESS SECURITY SYSTEMS--The student will be able to:**

- 123.01 Identify the strengths, weaknesses and appropriate uses of wireless LAN security techniques.
- 123.02 Describe types of wireless LAN security attacks, and explain how to identify and prevent them.
- 123.03 Given a wireless LAN scenario, identify the appropriate security solution from the following available wireless LAN security solutions.
- 123.04 Explain the uses of corporate security policies and how they are used to secure a wireless LAN.
- 123.05 Identify how and security precautions are used to secure a wireless LAN.

**124.0 DEMONSTRATE KNOWLEDGE OF WIRELESS INDUSTRY STANDARDS--The student will be able to:**

- 124.01 Identify, apply and comprehend the differences between wireless LAN standards.
- 124.02 Understand the roles of organizations in providing direction and accountability within the wireless LAN industry.
- 124.03 Identify the differences between the ISM and UNII bands.
- 124.04 Identify and understand the differences between the power output rules for point-to-point and point-to-multipoint links.

124.05 Identify the basic characteristics of infrared wireless LANs.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

Secondary Course Number: 8207070  
Course Title: Networking 6  
Course Credit: 1

**COURSE DESCRIPTION:**

This course continues the study of network support services. The content includes network security. After successful completion of this course, students will have met Occupational Completion Point - Data Code G, Data Communications Analyst. SOC Code 15-1081

**20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES - The student will be able to:**

- 20.29 Participate in work-based learning experiences in a network support services environment.LA.C.3.4.
- 20.30 Discuss the use of technology in a network support services environment. LA.C.3.4.
- 20.32 Discuss the management/supervisors skills needed in a network support services environment.

**130.0 DEMONSTRATE A KNOWLEDGE OF GENERAL SECURITY CONCEPTS--The student will be able to:**

- 130.01 Describe access control.
- 130.02 Describe network authentication.
- 130.03 Understand the various types of network attacks (backdoors, DOS, spoofing, etc.)
- 130.04 Identify and modify non-essential services and protocols.
- 130.05 Identify malicious code (virus, worm, Trojan).
- 130.06 Configure system auditing, logging, and scanning as it relates to security procedures.

**131.0 DEVELOP AN AWARENESS OF COMMUNICATION SECURITY CONCEPTS--The student will be able to:**

- 131.05 Describe remote access protocols (VPN, RADIUS, L2TP, etc.).
- 131.06 Identify E-mail security concerns (hoaxes, spam, etc.).
- 131.07 Identify web (HTML) security concepts and designs (HTTP/S, IM, etc.).
- 131.08 Demonstrate an awareness of file transfer security concerns.
- 131.09 Describe and identify wireless networking security concerns and vulnerabilities.

**132.0 DEVELOP AN AWARENESS OF NETWORK INFRASTRUCTURE SECURITY--The student will be able to:**

- 132.16 Install and configure network firewalls.
- 132.17 Identify security concerns with various wiring media (copper, fiber).
- 132.18 Identify security concerns associated with removable media and storage devices.

- 132.19 Demonstrate an awareness of security topologies (security zones, Intranets, NAT, etc.).
- 132.20 Configure and use intrusion detection software.
- 132.21 Establish security baselines (updates, patches, hotfixes, Access Control lists, etc.).
- 132.22 Demonstrate the ability to configure a Virtual Private Network (VPN).
- 132.23 Describe the function of Network Address Translation (NAT).

**133.0 DEVELOP AN AWARENESS OF CRYPTOGRAPHY AND ITS RELATION TO SECURITY—  
The student will be able to:**

- 133.06 Demonstrate an understanding of security algorithms and encryption.
- 133.07 Use and apply Public Key Certificates.
- 133.08 Demonstrate an understanding of standards and protocols in commerce.

**134.0 INCORPORATE ORGANIZATIONAL AND OPERATIONAL SECURITY IN AN  
APPROPRIATE AND EFFECTIVE MANNER—The student will be able to:**

- 134.06 Describe how to establish a network security policy.
- 134.07 Explain the importance of physical security to protect network resources.
- 134.08 Identify and use disaster recovery procedures.
- 134.09 Describe the importance of business continuity and its relationship to network and corporate security.
- 134.10 Describe security policies and procedures that would be used in a business environment.
- 134.11 Explain the importance of privilege management (access, password management, sign-on, etc.).
- 134.12 Describe the concept of forensics as it applies to network security (obtaining evidence of security breaches).
- 134.13 Explain the importance of educating users and supervisors in regard to network security.
- 134.14 Create documentation that describes standards and guidelines for a network security system.