

Minnesota State-Approved Technical Skill Assessments

4/20/2017

Pathway: Network Systems

Cluster: Information Technology

CLUSTER/ PATHWAY/ PROGRAM	CERTIFICATION / ASSESSMENT TITLE	TYPE	ISSUING ORGANIZATION	WEBSITE Please report broken web links	ELIGIBILITY REQUIREMENTS / PREREQUISITES	ADMINISTRA- TION ELIGIBILITY (Written, Oral, Practical, etc.)	PASSING SCORE	COST	COMMENTS
<p>● For use at SECONDARY For use at SECONDARY For use at SECONDARY For use at SECONDARY</p>									
Information Technology	(IC ³ ® Exam 1:) Computing Fundamentals	(IC ³ ®) Internet and Computing Core Certification	Certiport Centers (not at Pearson VUE or Prometric)	http://www.certiport.com	3 separate exams for certification: Computing Fundamentals, Key Applications, and Living Online	Online	Pass/Fail	\$28-\$45 per exam depending on sales and/or retake ability	May choose to assess in only one exam.
Information Technology	(IC ³ ® Exam 2:) Key Applications	(IC ³ ®) Internet and Computing Core Certification	Certiport Centers (not at Pearson VUE or Prometric)	http://www.certiport.com	3 separate exams for certification: Computing Fundamentals, Key Applications, and Living Online	Online	Pass/Fail	\$28-\$45 per exam depending on sales and/or retake ability	May choose to assess in only one exam.
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Information Technology	CompTIA Strata IT Fundamentals	CompTIA Cert 1 exam for those new to IT as well as those changing careers to IT	CompTIA: Certiport, Pearson VUE, or Prometric	http://www.certiport.com http://www.pearsonvue.com http://www.prometric.com/default.htm	Designed for individuals and students new to the IT job market as well as the increasing number of professionals changing careers to IT or technology-related fields.	Online	70%	\$87-\$102 Member org cost is less.	
Information Technology	CompTIA A+ Essentials	One of 2 exams for the CompTIA A+ Certification	CompTIA: Certiport, Pearson VUE, or Prometric	http://www.certiport.com http://www.pearsonvue.com http://www.prometric.com/default.htm	Measures the necessary competencies of an entry-level IT professional with a recommended 500 hours of hands-on experience in the lab or field.	Online	Pass/Fail	\$147-\$173 Member org cost is less	Also tests for understanding of computer technology, networking and security, as well as communication skills and professionalism.
Information Technology	CompTIA A+ Practical Applications	One of 2 exams for the CompTIA A+ Certification	CompTIA: Certiport, Pearson VUE, or Prometric	http://www.certiport.com http://www.pearsonvue.com http://www.prometric.com/default.htm	An extension of the knowledge and skills identified in A+ Essentials, with more of a "hands-on" orientation focused on scenarios in which troubleshooting and tools must be applied to resolve problems.	Online	Pass/Fail	\$147-\$173 Member org cost is less	

Information Technology	Test Out PC Pro Certification	Certification	Test Out Corporation	http://www.testout.com/home/certification/testout-pc-pro-certification	Students should have completed an entire course of study for PC hardware and software (equivalent to both TestOut A+ courses).	Online	Passing Score: 1100 on a scale of 200-1500.	The TestOut PC Pro Certification is included in the cost of TestOut's PC Pro and A+ courseware.	The TestOut PC Pro exam is comprised of several questions incorporating lab activities, each requiring multiple tasks.
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Information Technology	Test Out Windows Server Pro: Install & Configure Certification	Certification	Test Out Corporation	http://www.testout.com/home/certification/testout-windows-server-pro-install-configure-certification	Students should have completed the entire course of study for Windows Server Pro.	Online	Passing score: 1220 on a scale of 200-1700	The TestOut Windows Server Pro Certification exam is included in the cost of TestOut's Windows Server Pro: Install & Configure training.	The exam contains 15 performance-based questions in which your students will be asked to complete 50 tasks.

Network Systems	CompTIA IT Fundamentals Practical Exam - Security Pro	CompTIA Network+ Certification	CompTIA: Certiport, Pearson VUE, or Prometric	http://www.certiport.com http://pearsonvue.com http://www.prometric.com/default.htm		Online			
Network Systems	CompTIA IT Fundamentals Practical Exam - Network Pro	CompTIA Network+ Certification	CompTIA: Certiport, Pearson VUE, or Prometric	http://www.certiport.com http://pearsonvue.com http://www.prometric.com/default.htm		Online			
Network Systems	CompTIA Network+ Exam	CompTIA Network+ Certification	CompTIA: Certiport, Pearson VUE, or Prometric	http://www.certiport.com http://pearsonvue.com http://www.prometric.com/default.htm	Recommended certification before this exam is CompTIA A+.	Online	720 out of 900	\$209-\$246	
Network Systems	Certified Entry Networking Technician (CCENT)	Cisco Certification	Pearson VUE	http://www.cisco.com/web/learning/le3/le2/le45/learning_certification_level_home.html	CCENT is the first step toward Cisco CCNA (Cisco Certified Networking Associate) certification. ICND1 Interconnecting Cisco Networking Devices 1 --Exam	Online		\$125	

Network Systems	Computer Networking Fundamentals	Academic Assessment	NOCTI	http://www.nocti.org/Jobready.cfm	"Job ready" assessment that measures technical skills at the occupational level (entry-level worker).	Online or written	National Norm	\$19 per post-test exam; \$31 for pre-test & post-test exam	Contact NOCTI directly to order assessments for your high school program; information is on their web site.
Network Systems	Computer Repair Technology	Academic Assessment	NOCTI	http://www.nocti.org/Jobready.cfm	"Job ready" assessment that measures technical skills at the occupational level (entry-level worker).	Online or written	National Norm	\$19 per post-test exam; \$31 for pre-test & post-test exam	Contact NOCTI directly to order assessments for your high school program; information is on their web site.
Network Systems	Computer Technology	Academic Assessment	NOCTI	http://www.nocti.org/Jobready.cfm	"Job ready" assessment that measures technical skills at the occupational level (entry-level worker).	Online or written	National Norm	\$19 per post-test exam; \$31 for pre-test & post-test exam	Contact NOCTI directly to order assessments for your high school program; information is on their web site.

	NOCTI	NOCTI	TESTING AGREEMENT	Each institution/consortium should have a Testing Coordinator who contacts NOCTI to obtain assessment exams, proctoring information, data management needs, and other important functions. Click here for getting started: http://www.nocti.org/GettingStarted.cfm				\$19 per post-test exam; \$31 for pre-test & post-test exam	Contact NOCTI directly to order assessments for your high school program; information is on their web site.
Network Systems	Computer Technology (250E)	Academic Assessment	Precision Exams	http://www.precisionexams.com	End-of-course assessment that assesses key application software, basic computing fundamentals, and ethics and appropriate behavior while using technology as a tool.	Online	80%	\$6 per exam	50 questions on assessment; Grades 9-12; contact Precisions Exams for further information on ordering & assessing.
	Precision Exams-Washington	Precision Exams	TESTING AGREEMENT	Each institution/consortium should have a Testing Coordinator (or Proctor) who contacts Precision Exams to obtain assessment exams, proctoring information, data management needs, and other important functions. Click here for getting started: http://www.precisionexams.com					

Network Systems	SkillsUSA Computer Maintenance Technology	Academic Assessment	SkillsUSA	http://www.workforcereadysystem.org/technicalareas.shtml		Online	75%	\$10 member/ \$20 nonmember	All students in class must be members in SkillsUSA to get the member discount.
Network Systems	SkillsUSA Internetworking	Academic Assessment	SkillsUSA	http://www.workforcereadysystem.org/technicalareas.shtml		Online	75%	\$10 member/ \$20 nonmember	All students in class must be members in SkillsUSA to get the member discount.
Network Systems	SkillsUSA	SkillsUSA	SITE COORDINATOR	Each institution/consortium should have a coordinator who contacts SkillsUSA to obtain assessment exams, proctoring information, data management needs, and other important functions. Click here for the SkillsUSA Work Force Ready System Web site and browse the various Assessment Links and other details: http://www.workforcereadysystem.org					

Network Systems	Test Out Network Pro Certification	Certification	Test Out Corporation	http://www.testout.com/home/certification/testout-network-pro-certification	Students should have completed the entire course of study for Network Pro.	Online	Passing score: 1200 on a scale of 200-1700	The TestOut Network Pro Certification Exam is included in the cost of TestOut's Network Pro training.	The exam is comprised of lab and other question formats to provide an authentic assessment of hands-on abilities.
Network Systems	Test Out Security Pro Certification	Certification	Test Out Corporation	http://www.testout.com/home/certification/testout-security-pro-certification	Students should have completed the entire course of study for Security Pro.	Online	Passing score: 1220 on a scale of 170-1700.	The TestOut Security Pro Certification Exam is included in the cost of TestOut's Security Pro training.	Exam contains 14 performance-based simulation questions & asked to complete multiple tasks that are commonly performed by entry-level IT security professionals.

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Network Systems	CompTIA IT Fundamentals Practical Exam - Network Pro	CompTIA Network+ Certification	CompTIA: Certiport, Pearson VUE, or Prometric	http://www.certiport.com http://pearsonvue.com http://www.prometric.com/default.htm		Online			
Network Systems	CompTIA Network+ Exam	CompTIA Network+ Certification	CompTIA: Certiport, Pearson VUE, or Prometric	http://www.certiport.com http://www.pearsonvue.com http://www.prometric.com/default.htm	Recommended certification before this exam is CompTIA A+.	Online	720 out of 900	\$209-\$246	
Network Systems	CCENT (Cisco Certified Entry Networking Technician Certification) Cisco entry level	Cisco Certification	Pearson VUE	http://www.cisco.com/web/learning/le3/le2/le45/learning_certification_level_home.html	CCENT is the first step toward Cisco CCNA (Cisco Certified Networking Associate) certification. ICND1 Interconnecting Cisco Networking Devices 1 --Exam	Online	National Norm	\$125	
Network Systems	ICND1: Interconnecting Cisco Networking Devices 1	Cisco Certified Network Associate (CCNA®) Certification	Pearson VUE	http://www.cisco.com/web/learning/le3/le2/le0/le9/learning_certification_type_home.html	The two exams are: ICND1 (Interconnecting Cisco Networking Devices 1) and ICND2 (Interconnecting Cisco Networking Devices 2)	Online	National Norm	\$125 each of two exams. OR, \$150 for a single exam for those well prepared.	

Network Systems	ICND2: Interconnecting Cisco Networking Devices 2	Cisco Certified Network Associate (CCNA®) Certification	Pearson VUE	http://www.cisco.com/web/learning/le3/le2/le0/le9/learning_certification_type_home.html	The two exams are: ICND1 (Interconnecting Cisco Networking Devices 1) and ICND2 (Interconnecting Cisco Networking Devices 2)	Online	National Norm	\$125 each of two exams. OR, \$150 for a single exam for those well prepared.	
Network Systems	Cisco Certified Design Associate (CCDA®) Certification Exam	Cisco CCDA® Certification	Pearson VUE	http://www.cisco.com/web/learning/le3/le2/le0/le4/learning_certification_type_home.html	CCDA is a Cisco level higher than Entry. This Associate level indicates a foundation knowledge of network design for the Cisco converged network.	Online	National Norm	Exam has a new version as of Dec 2010, so not sure about cost. Probably \$250.	
Network Systems	MTA Exam: Networking Fundamentals	Microsoft Technology Associate Certification	MTA Licensed Campus	http://www.certiport.com To verify whether or not your campus is registered as an MTA Campus Licensed institution, call 1-888-999-9830 ext 7.	MTA exams are available only to and through accredited academic institutions. MTA Campus Licenses are available for purchase through Certiport.	Online	70 pts	Per student cost depends on how many students take exams.	Educational institutions can buy a one-year MTA Campus License which allows up to 1,000 exams to be delivered.
Network Systems	MTA Exam: Security Fundamentals	Microsoft Technology Associate Certification	MTA Licensed Campus	http://www.certiport.com To verify whether or not your campus is registered as an MTA Campus Licensed institution, call 1-888-999-9830 ext 7.	MTA exams are available only to and through accredited academic institutions. MTA Campus Licenses are available for purchase through Certiport.	Online	70 pts	Per student cost depends on how many students take exams.	Educational institutions can buy a one-year MTA Campus License which allows up to 1,000 exams to be delivered.

Network Systems	MTA Exam: Windows Server Administration Fundamentals	Microsoft Technology Associate Certification	MTA Licensed Campus	http://www.certiport.com To verify whether or not your campus is registered as an MTA Campus Licensed institution, call 1-888-999-9830 ext 7.	MTA exams are available only to and through accredited academic institutions. MTA Campus Licenses are available for purchase through Certiport.	Online	70 pts	Per student cost depends on how many students take exams.	Educational institutions can buy a one-year MTA Campus License which allows up to 1,000 exams to be delivered.
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Network Systems	SkillsUSA Internetworking	Academic Assessment	SkillsUSA	http://www.workforcereadysystem.org/technicalareas.shtml		Online	75%	\$10 member/ \$20 nonmember	All students in class must be members in SkillsUSA to get the member discount.

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Pathway: Network Systems
Cluster: Information Technology

KEY: Y=Essential N=Not Essential O=Optional

PERFORMANCE ELEMENT AND INDICATOR	PERFORMANCE MEASURE	COMMON CORE COMPETENCIES Consensus among work group		COMMENTS
		Secondary	Postsecondary	
TOPIC 1: ACADEMIC FOUNDATIONS: Achieve additional academic knowledge and skills required to pursue the full range of career and education opportunities within a career cluster and/or career pathway.				
ELEMENT 01.01: Achieve language art skills required to pursue postsecondary education and future career opportunities within the Network Systems pathway.				
INDICATOR 01.01.01 Demonstrate language arts knowledge and skills required to pursue the full range of post-secondary education and career opportunities.	MEASURE 01.01.01a Adapt language for audience, purpose, situation. (i.e. diction/structure, style).	Y	Y	<i>e.g. Talking with client.</i>
	MEASURE 01.01.01b Organize oral and written information and evaluate for accuracy, clarity, fact, and relevancy.	Y	Y	
	MEASURE 01.01.01c Compose and edit focused copy for a variety of written documents.	Y	Y	<i>e.g. Technical reports, short manuals.</i>
	MEASURE 01.01.01d Comprehend key elements of oral and written information.	Y	Y	<i>e.g. Cause/effect, comparisons/contrasts, conclusions, context, purpose, charts/tables/graphs, evaluation/critiques, mood, persuasive text, sequence, summaries, and technical subject matter.</i>
	MEASURE 01.01.01e Identify assumptions, purpose, and outcomes/solutions and predict potential outcomes and/or solutions from oral and written information regarding technology trends.	Y	Y	<i>e.g. Information security, organization's policies.</i>
	MEASURE 01.01.01f Present formal and informal speeches including discussion, information requests, interpretation, and persuasive arguments.	Y	Y	
ELEMENT 01.02: Achieve mathematics skills required to pursue postsecondary education and future career opportunities within the Network Systems pathway.				
INDICATOR 01.02.01 Demonstrate mathematics knowledge and skills required to pursue the full range of post-secondary education and career opportunities.	MEASURE 01.02.01a Demonstrate knowledge of basic arithmetic operations such as addition, subtraction, multiplication, and division and the use of relational expressions such as equal to, not equal, greater than, and less than.	Y	Y	<i>e.g. This includes whole numbers, decimals, and fractions.</i>

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	MEASURE 01.02.01b Apply data and measurements to solve a problem.	Y	Y	
	MEASURE 01.02.01c Analyze mathematical problem statements for missing and/or irrelevant data.	Y	Y	
	MEASURE 01.02.01d Construct charts/tables/graphs from functions and data.	O	O	
	MEASURE 01.02.01e Analyze and apply data when interpreting operational documents.	Y	Y	
ELEMENT 01.03: Achieve science skills required to pursue postsecondary education and future career opportunities within the Network Systems pathway.				
INDICATOR 01.03.01 Demonstrate science knowledge and skills required to pursue the full range of post-secondary and career education opportunities.	MEASURE 01.03.01a Evaluate and apply scientific methods in qualitative and quantitative analysis, data gathering, direct and indirect observation, predictions, and problem identification.	O	O	
TOPIC 2: COMMUNICATIONS - Communicate clearly and effectively with reason including technical terminology and information.				
ELEMENT 02.01: Use oral and written communications to communicate with co-workers and clients/customers.				
INDICATOR 02.01.01 Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice.	MEASURE 02.01.01a Determine, select, and apply the most appropriate reading strategy for identifying the overarching purpose of a text (i.e. skimming, reading for detail, reading for meaning or critical analysis).	Y	Y	
INDICATOR 02.01.02 Locate, organize and reference written information from various sources.	MEASURE 02.01.02a Locate, organize and reference written information from various sources.	Y	Y	
INDICATOR 02.01.03 Use correct grammar, punctuation and terminology to write and edit documents.	MEASURE 02.01.03a Compose multi-paragraph documents clearly, succinctly, and accurately using correct grammar, spelling, punctuation, and capitalization.	Y	Y	
	MEASURE 02.01.03b Create and interpret tables, charts, and figures to support written communications.	Y	Y	

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INDICATOR 02.01.04 Develop and deliver formal and informal presentations using appropriate media to engage and inform audiences.	MEASURE 02.01.04a Prepare and deliver oral presentations to provide information for specific purposes and audiences that sustains the listener's attention and interest.	Y	Y	
	MEASURE 02.01.04b Identify and prepare support materials that will enhance an oral presentation.	Y	Y	
	MEASURE 02.01.04c Create and interpret tables, charts, and figures to support an oral presentation.	O	O	
	MEASURE 02.01.04d Implement a variety of media strategies for presentations.	Y	Y	<i>e.g. power point, prezi, audio options</i>
INDICATOR 02.01.05 Interpret verbal and nonverbal cues/behaviors to enhance communication with co-workers and clients/customers.	MEASURE 02.01.05a Interpret verbal and nonverbal behaviors when communicating with co-workers and clients/customers.	O	O	
INDICATOR 02.01.06 Apply active listening skills to obtain and clarify information.	MEASURE 02.01.06a Interpret a given verbal and nonverbal message/information.	Y	Y	<i>e.g. Instructions from employer/manager or communication with client/customer</i>
	MEASURE 02.01.06b Respond with restatement and clarification techniques to clarify information.	Y	Y	
	MEASURE 02.01.06b Model behaviors that demonstrate active listening.	Y	Y	
INDICATOR 02.01.07 Demonstrate ability to communicate & resolve conflicts within a diverse workforce.	MEASURE 02.01.07a Demonstate ability to communicate & resolve conflicts within a diverse workforce.	O	O	<i>e.g. Team-based projects</i>
INDICATOR 02.01.08 Exhibit public relations skills to increase internal and external customer/client satisfaction.	MEASURE 02.01.08a Communicate effectively when developing positive customer/client relationships.	Y	Y	

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ELEMENT 02.02: Develop positive customer relations to build and maintain a customer base in the Network Systems industry.

INDICATOR 02.02.01 Demonstrate ability to assist customers in a professional manner.	MEASURE 02.02.01a Determine customers' individual needs.	Y	Y	
	MEASURE 02.02.01b Project a professional business images.	Y	Y	<i>e.g., Appearance, voice, grammar, word usage, enunciation, nonverbal communication.</i>
	MEASURE 02.02.01c Interact with customers/ clients and coworkers in a professional manner.	Y	Y	<i>e.g., Prompt, friendly, courteous, respectful, helpful, knowledgeable, understandable.</i>
	MEASURE 02.02.01d Document step-by-step installation and configuration procedures.	Y	Y	
INDICATOR 02.02.02 Document procedures using clear and effective notes for future use.	MEASURE 02.02.02a Ensure that work promotes the best interest of the company.	Y	Y	
	MEASURE 02.02.02b Develop audit trails.	Y	Y	

TOPIC 3: PROBLEM-SOLVING AND CRITICAL THINKING - Utilize critical thinking skills to make sense of problems and persevere in solving them. Employ valid, reliable research strategies. Demonstrate creativity and innovation.

INDICATOR 03.01 Solve problems using critical thinking skills (analyze, synthesis, and evaluate) independently and in teams.	MEASURE 03.01.01 Solve problems using critical thinking skills (analyze, synthesis, and evaluate) independently and in teams.	Y	Y	<i>e.g. Refer to Topic 10: Technical Skills for additional indicators and measures in problem-solving and critical thinking in the Network Systems career pathway.</i>
INDICATOR 03.02 Solve problems using creativity and innovation.	MEASURE 03.02.01 Solve problems using creativity and innovation.	Y	Y	<i>e.g. Refer to Topic 10: Technical Skills for additional indicators and measures in problem-solving and critical thinking in the Network Systems career pathway.</i>

TOPIC 4: TECHNOLOGY APPLICATIONS - Use technology to enhance productivity.

INDICATOR 04.01 Use technology to increase workplace efficiency.	MEASURE 04.01.01 Manage personal schedules and contact information.	Y	Y	
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<p>INDICATOR 04.02 Employ technological tools to expedite workflow.</p>	<p>MEASURE 04.02.01 Use information technology tools to manage and perform work responsibilities.</p>	<p>Y</p>	<p>Y</p>	
<p>INDICATOR 04.03 Utilize technology applications to communicate within a workplace.</p>	<p>MEASURE 04.03.01 Use technology applications to share files and documents.</p>	<p>Y</p>	<p>Y</p>	
	<p>MEASURE 04.03.02 Use technology applications to communicate within and across organizations.</p>	<p>Y</p>	<p>Y</p>	
<p>INDICATOR 04.04 Utilize web to perform workplace tasks.</p>	<p>MEASURE 04.04.01 Use web for searching information and resources.</p>	<p>Y</p>	<p>Y</p>	
	<p>MEASURE 04.04.02 Evaluate web resources for reliability and validity.</p>	<p>Y</p>	<p>Y</p>	
<p>INDICATOR 04.05 Utilize spreadsheet applications to organize and manipulate data.</p>	<p>MEASURE 04.05.01 Utilize spreadsheet applications to organize and manipulate data.</p>	<p>Y</p>	<p>Y</p>	
<p>INDICATOR 04.06 Utilize database applications to manage data.</p>	<p>MEASURE 04.08.01 Utilize database applications to manage data.</p>	<p>Y</p>	<p>Y</p>	
<p>INDICATOR 04.07 Utilize collaborative tools to facilitate group work.</p>	<p>MEASURE 04.07.01 Utilize collaborative tools to facilitate group work.</p>	<p>Y</p>	<p>Y</p>	
<p>INDICATOR 04.08 Utilize computer operating systems to manage work tasks including file management.</p>	<p>MEASURE 04.08.01 Utilize computer operating systems to manage work tasks including file management.</p>	<p>Y</p>	<p>Y</p>	<p><i>e.g. Network shares</i></p>
<p>INDICATOR 04.09 Use computer-based equipment (containing embedded computers or processors) to control devices.</p>	<p>MEASURE 04.09.01 Operate computer driven equipment, peripherals and network devices.</p>	<p>Y</p>	<p>Y</p>	
	<p>MEASURE 04.09.02 Use installation and operation manuals.</p>	<p>Y</p>	<p>Y</p>	
	<p>MEASURE 04.09.03 Troubleshoot computer driven equipment and machines.</p>	<p>Y</p>	<p>Y</p>	

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	MEASURE 04.09.04 Access support as needed to maintain operation of computer driven equipment.	Y	Y	
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TOPIC 5: ORGANIZATIONAL AND GLOBAL SYSTEMS – Understand the environmental, social, and economic impacts of decisions within an organization. Understand global context of industries and careers.

INDICATOR 05.01 Identify and explain what the impacts are on business, industry and government when IT is integrated.	MEASURE 05.01.01 Identify and explain what the impacts are on business, industry and government when IT is integrated.	O	O	
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TOPIC 6: SAFETY, HEALTH, AND ENVIRONMENT – Understand the importance of safety, health, and environmental management systems and their importance to organizational performance and regulatory compliance.

INDICATOR 06.01 Have a knowledge of personal and jobsite safety rules and regulations to maintain safe and healthful working conditions and environments.	MEASURE 06.01.01 Assess and recommend workplace conditions with regard to safety and health.	Y	Y	
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TOPIC 7: LEADERSHIP AND TEAMWORK - Use leadership in collaborating with others to accomplish productive organizational goals and objectives with an awareness of cultural/global competence.

INDICATOR 07.01 Demonstrate interpersonal skills to accomplish organizational goals and objectives.	MEASURE 07.01.01 Demonstrate personal and interpersonal skills appropriate to the workplace.	Y	Y	
	MEASURE 07.01.02 Participate in civic and community leadership and teamwork opportunities to enhance skills.	O	O	

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TOPIC 8: ETHICS AND LEGAL RESPONSIBILITIES –Know, understand, and model the importance of ethics, integrity, and legal responsibilities.

INDICATOR 08.01 Apply standard practices and behaviors that meet legal and ethical responsibilities and exhibit positive cyber-citizenry to understand legal issues faced by IT professionals.	MEASURE 08.01.01 Identify legal and ethical issues faced by IT professionals.	Y	Y	
	MEASURE 08.01.02 Explain legal issues involved in IT security policies.	Y	Y	
	MEASURE 08.01.03 Demonstrate knowledge of the legal issues that face organizations and IT professionals.	Y	Y	
	MEASURE 08.01.04 Identify issues and trends affecting computers and information privacy.	Y	Y	

TOPIC 9: CAREER DEVELOPMENT, EMPLOYABILITY, AND CITIZENSHIP –Attend to personal health and financial well-being. Know and understand the importance of employability skills. Plan education and career paths aligned to personal goals and employability goals. Act as a responsible and contributing citizen and employee.

INDICATOR 09.01 Assess and evaluate career opportunities in Network Systems career pathway to broaden awareness of careers available in the profession.	MEASURE 09.01.01 Match personal interests and aptitudes to careers when researching opportunities within the pathway.	Y	Y	<i>e.g., Identify desirable personality traits important to business - positive attitude, self-confidence, interest & enthusiasm, initiative.</i>
	MEASURE 09.01.02 Participate in career planning to enhance job-success potential and learn new knowledge and skills.	Y	Y	<i>e.g., Assess personal interests and skills needed for success in IT industry.</i>
				<i>e.g. Identify sources of career information & employment opportunities in IT.</i>
				<i>e.g. Prepare letters of applications, resume, and letters of reference for future employment</i>
			<i>e.g. Practice interview skills and employability skills through experiential learning (e.g. job shadowing, mentorship, internship).</i>	

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	<p>MEASURE 09.01.03 Utilize career-advancement activities to enhance professional development.</p>	Y	Y	<p><i>e.g. Describe techniques for obtaining work experience (volunteer activities, internships)</i> <i>e.g. Explain the need for ongoing education as a worker.</i> <i>e.g. Identify skills needed to enhance career progression.</i> <i>e.g. Utilize resources that can contribute to professional development (trade journals/ periodicals professional/ trade associations).</i></p>
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TOPIC 10: TECHNICAL LITERACY – Apply technical knowledge and skills required to pursue careers in a specific career cluster and/or career pathway.

ELEMENT 10.01: Demonstrate knowledge of the hardware components associated with information systems.

<p>INDICATOR 10.01.01 Identify computer classifications and hardware.</p>	<p>MEASURE 10.01.01a Identify major hardware components and their functions.</p>	Y	Y	
	<p>MEASURE 10.01.01b Identify the hardware associated with digital communications functions.</p>	Y	Y	<p><i>e.g. WAN, LAN</i></p>
	<p>MEASURE 10.01.01c Identify types of storage functions.</p>	Y	Y	
<p>INDICATOR 10.01.02 Describe elements and types of information processing.</p>	<p>MEASURE 10.01.02a Identify the elements of the information processing cycle.</p>	Y	Y	<p><i>e.g. input, process, output, storage</i></p>
	<p>MEASURE 10.01.02b Identify types of processing.</p>	Y	O	<p><i>e.g. batch, interactive, event-driven, object-oriented</i></p>
<p>INDICATOR 10.01.03 Use available reference tools as appropriate.</p>	<p>MEASURE 10.01.03a Access needed information using company and manufacturers' references .</p>	Y	Y	<p><i>e.g. procedural manuals, documentation, standards, work flowcharts</i></p>

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ELEMENT 10.02: Compare classes of software associated with the development and maintenance information systems to develop software and maintain computer systems.

INDICATOR 10.02.01 Explain the functions of operating systems and hardware components.	MEASURE 10.02.01a Identify major operating system fundamentals and components.	Y	Y	
INDICATOR 10.02.02 Explain the role of number systems in information systems.	MEASURE 10.02.02a Demonstrate knowledge of number systems and internal data representation.	Y	Y	<i>e.g. binary, hexadecimal system</i>
INDICATOR 10.02.03 Explain the key functions and applications of software.	MEASURE 10.02.03a Demonstrate knowledge of the key functions of systems software.	Y	Y	
	MEASURE 10.02.03b Demonstrate knowledge of widely used software applications.	Y	Y	<i>e.g. Microsoft Office word processing, database management, spreadsheet development</i>

ELEMENT 10.03: Identify and compare new IT trends and technologies to build an understanding of their potential influence on IT practices.

INDICATOR 10.03.01 Identify and compare new trends and technologies.	MEASURE 10.03.01a Identify emerging information technologies.	Y	Y	
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ELEMENT 10.04: Summarize basic data communications components and trends to maintain and update IT systems.

INDICATOR 10.04.01 Explain data communications procedures, equipment and media.	MEASURE 10.04.01a Demonstrate knowledge of the uses of data communications equipment.	Y	Y	
	MEASURE 10.04.01b Demonstrate knowledge of the types of communications media.	Y	Y	
INDICATOR 10.04.02 Explain data transmissions codes and protocols.	MEASURE 10.04.02a Demonstrate knowledge of data transmission codes and protocols.	Y	Y	
INDICATOR 10.04.03 Explain the various types of networks.	MEASURE 10.04.03a Distinguish between the various types of networks.	Y	Y	

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INDICATOR 10.04.04 Summarize data communication trends and issues.	MEASURE 10.04.04a Identify data communication trends.	Y	Y	
	MEASURE 10.04.04b Identify major current issues in data communications.	Y	Y	
ELEMENT 10.05: Describe Internet protocols.				
INDICATOR 10.05.01 Describe Internet protocols.	MEASURE 10.05.01a Demonstrate knowledge of the Transmission Control Protocol/Internet Protocol (TCP/IP) suite.	Y	Y	
	MEASURE 10.05.01b Demonstrate knowledge of management protocols, applications and procedures.	Y	Y	
	MEASURE 10.05.01c Explain routing protocols.	Y	Y	
INDICATOR 10.05.02 Explain Domain Name Service (DNS).	MEASURE 10.05.02a Explain knowledge of the Domain Name -Service (DNS).	Y	Y	
	MEASURE 10.05.02b Explain the DNS hierarchy.	Y	Y	
	MEASURE 10.05.02c Explain elements of DNS.	Y	Y	<i>e.g. zones, servers types</i>
ELEMENT 10.06: Access and use Internet services when completing IT related tasks to service and update IT systems.				
INDICATOR 10.06.01 Demonstrate the ability to establish and troubleshoot an Internet connection.	MEASURE 10.06.01a Configure an Internet connection using appropriate Internet sources and technologies.	Y	Y	
	MEASURE 10.06.01b Test Internet connection using appropriate tools.	Y	Y	<i>e.g. Ping, trace route, net stat, host, dig, and nslookup</i>
	MEASURE 10.06.01c Troubleshoot Internet connection problems.	Y	Y	<i>e.g., Using OSI model reference</i>
INDICATOR 10.06.02 Demonstrate knowledge of the components of Internet software.	MEASURE 10.06.02a Install and configure Internet browser.	O	Y	
	MEASURE 10.06.02b Install common browser features.	O	Y	
	MEASURE 10.06.02c Install Internet software.	O	Y	

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	MEASURE 10.06.02d Differentiate between remote applications and applications installed on a local computer.	O	Y	
	MEASURE 10.06.02e Download and maintain software from the Internet.	O	Y	
	MEASURE 10.06.02f Unpack files using compression software.	O	O	
INDICATOR 10.06.03 Compare and contrast clients and servers.	INDICATOR 10.06.03a Differentiate between a client and a server.	Y	Y	
	INDICATOR 10.06.03b Explain the nature of the client/server relationship.	Y	Y	
INDICATOR 10.06.04 Describe how bandwidth affects data transmission.	MEASURE 10.06.04a Demonstrate knowledge of how bandwidth affects data transmission.	O	Y	
INDICATOR 10.06.05 Describe computer protection procedures.	INDICATOR 10.06.05a Explain spyware, adware, and malware.	O	Y	
	INDICATOR 10.06.05b Identify how to avoid spyware, adware, and malware and how to recover from infection.	O	Y	
	MEASURE 10.06.05c Identify types and capabilities of antimalware applications.	O	Y	
	INDICATOR 10.06.05c Demonstrate awareness of virus protection techniques.	O	Y	
	MEASURE 10.06.05e Demonstrate knowledge of cookies and their use on an internet connected computer system.	Y	O	
	MEASURE 10.06.05f Identify types and consequences of pop-ups and adware.	O	O	
INDICATOR 10.06.06 Explain the features and functions of Web browsing software.	MEASURE 10.06.06a Explain the features and functions of Web browsing software.	O	O	

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INDICATOR 10.06.07 Compare the benefits of Web hosting.	MEASURE 10.06.07a Compare the advantages and disadvantages of Web hosting.	O	Y	
	MEASURE 10.06.07b Identify and contrast the prominent protocols used for web page hosting.	O	Y	<i>e.g., http, https, ftp</i>
ELEMENT 10.07: Install and configure software programs to maintain and update IT systems.				
INDICATOR 10.07.01 Verify that hardware and software system components are compatible prior to performing installation.	MEASURE 10.07.01a Identify hardware and software requirements.	Y	Y	<i>e.g., Processor, memory, disk space, communications, printers, monitors.</i>
	MEASURE 10.07.01b Determine compatibility of hardware and software.	O	Y	
MEASURE 10.07.02 Verify that software to be installed is licensed prior to performing installation.	MEASURE 10.07.02a Verify conformance to licensing agreement.	Y	Y	
	MEASURE 10.07.02b Understand the concept of an End User License Agreement (EULA).	O	Y	
	MEASURE 10.07.02c Differentiate between open source and proprietary licenses.	O	Y	
INDICATOR 10.07.03 Perform successful software installation accurately and completely, using available resources as needed.	MEASURE 10.07.03a Install given application/system software on various platforms in accordance with manufacturer's procedures and business requirements.	O	Y	
	MEASURE 10.07.03b Differentiate between stand-alone and network installation procedures.	Y	N	
	MEASURE 10.07.03c Select appropriate installation options.	O	Y	
	MEASURE 10.07.03d Verify software installation and operation.	O	Y	
	MEASURE 10.07.03e Troubleshoot unexpected results.	Y	Y	
ELEMENT 10.08: Install, configure, and maintain an operating system.				
INDICATOR 10.08.01 Configure and maintain operating system.	MEASURE 10.08.01a Secure needed supplies and resources.	O	Y	
	MEASURE 10.08.01b Identify data requirements.	O	Y	

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INDICATOR 10.08.02 Use operating system principles to ensure optimal system functions.	MEASURE 10.08.02a Apply basic commands of operating system software.	Y	Y	
	MEASURE 10.08.02b Apply appropriate file and disk management techniques.	O	Y	
	MEASURE 10.08.02c Employ desktop operating skills.	O	Y	
	MEASURE 10.08.02d Handle materials and equipment in a responsible manner.	O	Y	
	MEASURE 10.08.02e Follow power-up and log-on procedures.	O	Y	
	MEASURE 10.08.02f Interact with/respond to system messages.	O	Y	
	MEASURE 10.08.02g Follow log-off and power-down procedures(s).	O	Y	

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ELEMENT 10.09: Describe and implement network systems security.

INDICATOR 10.09.01 Address potential security threats to information systems.	MEASURE 10.09.01a Describe potential security threats to information systems.	Y	Y	
	MEASURE 10.09.01b Provide for user authentication and restricted access.	Y	Y	<i>e.g. assign passwords, access level</i>
	MEASURE 10.09.01c Document security procedures.	Y	Y	
	MEASURE 10.09.01d Assess exposure to security issues.	Y	Y	
	MEASURE 10.09.01e Implement countermeasures.	Y	Y	
	MEASURE 10.09.01f Ensure compliance with security rules, regulations, and codes.	Y	Y	
	MEASURE 10.09.01g Demonstrate knowledge of threat protection strategies.	Y	Y	
	MEASURE 10.09.01h Implement security procedures in accordance with business policies.	Y	Y	
INDICATOR 10.09.02 Analyze network security systems.	MEASURE 10.09.02a Identify security requirements and the need for data protection.	Y	Y	
	MEASURE 10.09.02b Identify specific access levels that need to be accommodated.	Y	Y	
	MEASURE 10.09.02c Match security system design to identified business security requirements.	Y	Y	
INDICATOR 10.09.03 Implement network security systems.	MEASURE 10.09.03a Demonstrate knowledge of security requirements and the need for data protection.	Y	Y	
	MEASURE 10.09.03b Demonstrate the knowledge of access levels that need to be accommodated.	Y	Y	
	MEASURE 10.09.03c Demonstrate the knowledge of the role that routers, firewalls, intrusion detection systems, and VPNs play in security.	Y	Y	
	MEASURE 10.09.03d Apply security plan.	Y	Y	

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ELEMENT 10.10: Perform standard computer backup procedures to protect IT information.

INDICATOR 10.10.01 Perform computer disaster recovery procedures.	MEASURE 10.10.01a Install surge suppression protection.	Y	Y	
	MEASURE 10.10.01b Identify and maintain battery backup equipment.	Y	Y	
	MEASURE 10.10.01c Recognize the need for regular backup procedures.	Y	Y	
	MEASURE 10.10.01d Establish process for archiving files.	Y	Y	
	MEASURE 10.10.01e Identify common backup solutions.	Y	Y	
	MEASURE 10.10.01f Explain fault tolerance concepts.	Y	Y	
	MEASURE 10.10.01g Establish and maintain a disaster recovery plan.	Y	Y	

ELEMENT 10.11: Maintain computer systems to ensure optimal IT system functioning.

INDICATOR 10.11.01 Ensure that system is functioning optimally.	MEASURE 10.11.01a Monitor network system status and performance.	Y	Y	
	MEASURE 10.11.01b Run diagnostics.	Y	Y	
	MEASURE 10.11.01c Respond to system messages.	Y	Y	
	MEASURE 10.11.01d Perform preventive maintenance procedures on computer and peripheral devices.	Y	Y	
	MEASURE 10.11.01e Handle materials and equipment in a responsible manner.	Y	Y	
	MEASURE 10.11.01f Optimize operating system environment to maximize performance of desktop	Y	Y	
	MEASURE 10.11.01g Review automated scheduling software.	Y	Y	
INDICATOR 10.11.02 Fix and document system problems and solutions.	MEASURE 10.11.02a Fix recoverable problems.	Y	Y	
	MEASURE 10.11.02b Restore system.	Y	Y	
	MEASURE 10.11.02c Document computer system malfunctions.	Y	O	

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	MEASURE 10.11.02d Document software malfunction(s).	Y	Y	
INDICATOR 10.11.03 Configure systems to provide optimal hardware system interface .	MEASURE 10.11.03a Define hardware-software interface issues for a networking system.	O	O	
	MEASURE 10.11.03b Apply concepts of privileges instructions and protected mode programming.	O	N	
	MEASURE 10.11.03c Configure peripheral device drivers.	O	Y	
	MEASURE 10.11.03d Allocate disk space, non-sharable resources, and I/O devices.	O	Y	
	MEASURE 10.11.03e Apply advanced I/O concepts.	O	Y	<i>e.g. disk caching, data compression, extended memory, and formats</i>
ELEMENT 10.12: Analyze a network system to determine if it meets specifications.				
INDICATOR 10.12.01 Evaluate the correctness and effectiveness of implementing the network system.	MEASURE 10.12.01a Employ the use of prototyping to evaluate network system functionality.	Y	Y	<i>Very important!</i>
ELEMENT 10.13: Design a network system using technologies, tools and standards to demonstrate a basic understanding of network architecture.				
INDICATOR 10.13.01 Demonstrate knowledge of the basics of network architecture.	MEASURE 10.13.01a Demonstrate knowledge of the characteristics and uses of network components.	Y	Y	<i>e.g. hub, switches, routers, firewall</i>
	MEASURE 10.13.01b Differentiate between a physical and logical topology.	Y	Y	
	MEASURE 10.13.01c Demonstrate knowledge of OSI model.	Y	Y	
	MEASURE 10.13.01d Demonstrate knowledge of LAN transmission methods, standards, and protocols.	Y	Y	
	MEASURE 10.13.01e Demonstrate knowledge of various frame types and formats.	Y	Y	
	MEASURE 10.13.01f Differentiate processes, services, and protocols.	Y	Y	

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INDICATOR 10.13.02 Demonstrate knowledge of network classifications and topologies.	MEASURE 10.13.02a Differentiate between LANs and WANs.	Y	Y	
	MEASURE 10.13.02b Differentiate between point-to-point and point-to-multipoint network topologies.	Y	Y	
	MEASURE 10.13.02c Demonstrate knowledge of packet-switching techniques.	Y	Y	
	MEASURE 10.13.02d Identify basic physical and logical topology.	Y	Y	<i>e.g. star, ring, bus</i>
	MEASURE 10.13.02e Demonstrate knowledge of characteristics of connection-oriented and connectionless networks.	Y	Y	
	MEASURE 10.13.02f Investigate emerging network technologies.	Y	Y	
	MEASURE 10.13.02g Demonstrate knowledge of electronic communications.	Y	N	<i>e.g. LAN, Internet, remote database access, EDI</i>
	MEASURE 10.13.02h Demonstrate knowledge of analog vs. digital signals.	Y	Y	
	MEASURE 10.13.02i Demonstrate knowledge of Voice over IP (VoIP) concepts.	Y	Y	
	MEASURE 10.13.02j Explain the benefits and issues related to convergence.	Y	Y	
INDICATOR 10.14.03 Implement common networking platforms.	MEASURE 10.14.03a Select a LAN/WAN technology that meets defined set of requirements.	Y	Y	
	MEASURE 10.14.03b Demonstrate how the four components of a network operating system characterize and support network operations.	Y	Y	<i>Includes server platform, network services software, network redirection software, communications software</i>
INDICATOR 10.14.04 Implement appropriate LAN physical/atmospheric media.	MEASURE 10.14.04a Demonstrate knowledge of the reasons for installing different types of network media.	Y	Y	
	MEASURE 10.14.04b Install local-area network (LAN) media.	Y	Y	
	MEASURE 10.14.04c Test and troubleshoot network media for performance.	Y	Y	
	MEASURE 10.14.04d Demonstrate knowledge of the principles and operation of wire and wireless media.	Y	Y	

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INDICATOR 10.14.05 Demonstrate knowledge of communication standards for networks.	MEASURE 10.14.05a Demonstrate knowledge of the open system interconnection (OSI) standard.	Y	Y	
	MEASURE 10.14.05b Identify standard high-speed networks.	Y	Y	
INDICATOR 10.14.06 Use systems in network development.	MEASURE 10.14.06a Demonstrate knowledge of interconnecting LANs using WAN services.	Y	Y	
	MEASURE 10.14.06b Select primary and backup data circuits.	Y	Y	
	MEASURE 10.14.06d Configure a Virtual Private Network (VPN).	Y	Y	
	MEASURE 10.14.06e Demonstrate knowledge of the conversion of analog speech to digital.	Y	N	
INDICATOR 10.14.07 Characterize the Network Operating Systems.	MEASURE 10.14.07a Demonstrate knowledge of Network Operating Systems.	Y	Y	
	MEASURE 10.14.07b Demonstrate knowledge about the difference between stand-alone, peer-to-peer, and client-server networks and software.	Y	Y	
ELEMENT 10.15: Install and configure a network system.				
INDICATOR 10.15.01 Install a network infrastructure.	MEASURE 10.15.01a Evaluate installation requirements.	Y	Y	
	MEASURE 10.15.01b Install information system application programs in accordance with requirements.	Y	Y	
	MEASURE 10.15.01c Install appropriate operating system hardware and software and peripherals.	Y	Y	
	MEASURE 10.15.01d Identify differences between stand-alone and network applications/operating systems.	Y	Y	
	MEASURE 10.15.01e Access needed technical information using software help facilities.	Y	Y	
INDICATOR 10.15.02 Install a network infrastructure.	MEASURE 10.15.02a Plan installation to minimize disruption of process flow.	Y	Y	
	MEASURE 10.15.02b Resolve compatibility issues.	Y	Y	

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	MEASURE 10.15.02c Configure software appropriately for system and user application.	Y	Y	
	MEASURE 10.15.02d Assemble necessary components to complement information system design.	Y	Y	
	MEASURE 10.15.02e Utilize LAN Management software.	Y	Y	
	MEASURE 10.15.02f Import/export data between different software packages.	Y	Y	
INDICATOR 10.15.03 Configure a Network Operating System.	MEASURE 10.15.03a Choose and implement an appropriate routing protocol.	Y	Y	
	MEASURE 10.15.03b Develop a logical device naming convention.	Y	Y	
	MEASURE 10.15.03c Define traffic priorities.	Y	Y	
ELEMENT 10.16: Perform network monitoring to maintain a network system.				
INDICATOR 10.16.01 Monitor network performance including information management and infrastructure.	MEASURE 10.16.01a Create a baseline of system/network performance.	Y	Y	
	MEASURE 10.16.01b Monitor system status and performance.	Y	Y	
	MEASURE 10.16.01c Identify required service level.	Y	Y	
	MEASURE 10.16.01d Recognize system alerts.	Y	Y	
	MEASURE 10.16.01e Recognize security problems.	Y	Y	
	MEASURE 10.16.01f Identify abnormal system performance.	Y	Y	
	MEASURE 10.16.01g Recognize environmental problems.	Y	Y	
	MEASURE 10.16.01h Conduct post-implementation evaluation.	Y	Y	
INDICATOR 10.16.02 Perform network system administration tasks.	MEASURE 10.16.02a Add and delete user.	Y	Y	
	MEASURE 10.16.02b Implement a group policy.	Y	Y	

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	MEASURE 10.16.02c Add and delete groups.	Y	Y	
	MEASURE 10.16.02d Resetting passwords.	Y	Y	
ELEMENT 10.17: Perform network maintenance and user support services to maintain a network system.				
INDICATOR 10.17.01 Apply software updates, service packs and patches .	MEASURE 10.17.01a Install and configure software updates.	Y	Y	
	MEASURE 10.17.01b Upgrade network system software.	Y	Y	
INDICATOR 10.17.02 Install and configure network system updates.	MEASURE 10.17.02a Demonstrate knowledge of the basic elements of network maintenance.	Y	Y	
	MEASURE 10.17.02b Identify available diagnostic and maintenance tools.	Y	Y	
	MEASURE 10.17.02c Document network system malfunction(s) .	Y	Y	<i>Important!</i>
	MEASURE 10.17.02d Fix recoverable problems.	Y	Y	
	MEASURE 10.17.02e Perform preventive maintenance procedures on computer and peripheral devices.	Y	N	
	MEASURE 10.17.02f Restore system(s).	Y	Y	
	MEASURE 10.17.02g Identify new or replacement networking components needed.	Y	Y	
	MEASURE 10.17.02h Establish and create a preventative maintenance plan.	Y	Y	
	MEASURE 10.17.02i Create maintenance plan for regular integrity checks.	Y	N	
	MEASURE 10.17.02j Identify maintenance procedures and processes.	Y	N	
	MEASURE 10.17.02k Evaluate maintenance procedures and processes.	O	O	
MEASURE 10.17.02l Select most appropriate solutions.	Y	N		

Pathway: Network Systems

Cluster: Information Technology

KEY: Y=Essential N=Not Essential O=Optional

INDICATOR 10.17.03 Troubleshoot network system procedures.	MEASURE 10.17.03a Demonstrate knowledge of troubleshooting steps.	Y	Y	
	MEASURE 10.17.03b Identify available diagnostic tools-	Y	Y	
	MEASURE 10.17.03c Perform appropriate analysis to identify problem cause.	Y	Y	
	MEASURE 10.17.03d Develop resolution plan.	Y	Y	
	MEASURE 10.17.03e Identify possible solutions.	Y	Y	
	MEASURE 10.17.03f Test identified solutions.	Y	Y	
	MEASURE 10.17.03g Detect problems.	Y	Y	
	MEASURE 10.17.03h Identify critically of problem.	Y	Y	
	MEASURE 10.17.03i Identify problems using diagnostic tools.	Y	Y	
	MEASURE 10.17.03j Document results and solutions.	Y	Y	
INDICATOR 10.17.04 Troubleshoot data communications.	MEASURE 10.17.04a Isolate system faults in various types of networks, cables, and carrier systems.	Y	Y	
	MEASURE 10.17.04b Determine hardware communication faults utilizing diagnostic tools.	Y	Y	
	MEASURE 10.17.04c Identify network problems utilizing network management tools.	Y	Y	

Technical Skill Assessment Blueprint

7/1/2015

Pathway: Network Systems

Cluster: Information Technology

An "assessment blueprint" is a document that indicates the knowledge and skills that will be covered in an assessment instrument and the percentage of the assessment that will be devoted to each area of knowledge and skills. The Minnesota assessment blueprints will be used to review the appropriateness of existing assessments by determining how closely those assessments match up to what the Network Systems career pathway working groups have determined should be assessed. The assessment blueprints can also be used to guide the development of new assessments where suitable third-party assessments do not exist.

		SECONDARY	POST-SECONDARY	BUSINESS & INDUSTRY
		% of Assessment ↓	% of Assessment ↓	% of Assessment ↓
TOPIC 1	ACADEMIC FOUNDATIONS: Achieve additional academic knowledge and skills required to pursue the full range of career and education opportunities within a career cluster and/or career pathway.	5%	6%	5%
TOPIC 2	COMMUNICATIONS - Communicate clearly and effectively with reason including technical terminology and information.	9%	9%	10%
TOPIC 3	PROBLEM-SOLVING AND CRITICAL THINKING - Utilize critical thinking skills to make sense of problems and persevere in solving them. Employ valid, reliable research strategies. Demonstrate creativity and innovation.	20%	12%	17%
TOPIC 4	TECHNOLOGY APPLICATIONS - Use technology to enhance productivity.	15%	7%	5%
TOPIC 5	ORGANIZATIONAL AND GLOBAL SYSTEMS – Understand the environmental, social, and economic impacts of decisions within an organization. Understand global context of industries and careers.	0%	7%	5%
TOPIC 6	SAFETY, HEALTH, AND ENVIRONMENT – Understand the importance of safety, health, and environmental management systems and their importance to organizational performance and regulatory compliance.	0%	2%	3%
TOPIC 7	LEADERSHIP AND TEAMWORK - Use leadership in collaborating with others to accomplish productive organizational goals and objectives with an awareness of cultural/global competence.	0%	5%	5%
TOPIC 8	ETHICS AND LEGAL RESPONSIBILITIES –Know, understand, and model the importance of ethics, integrity, and legal responsibilities.	5%	5%	5%
TOPIC 9	CAREER DEVELOPMENT, EMPLOYABILITY, AND CITIZENSHIP –Attend to personal health and financial well-being. Know and understand the importance of employability skills. Plan education and career paths aligned to personal goals and employability goals. Act as a responsible and contributing citizen and employee.	10%	6%	5%
TOPIC 10	TECHNICAL LITERACY – Apply technical knowledge and skills required to pursue careers in a specific career cluster and/or career pathway.	36%	41%	40%
		100%	100%	100%

Information Technology: Network Systems

Career Pathway Plan of Study for ► Learners ► Parents ► Counselors ► Teachers/Faculty--Effective Graduates 2015 & Beyond

*This Career Pathway Plan of Study (based on the Network Systems Pathway of the Information Technology Career Cluster) can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals. *This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.*

EDUCATION LEVELS	GRADE	English/ Language Arts	Math	Science	Social Studies/ Sciences	Other Required Courses Other Electives Recommended Electives Learner Activities	*Career and Technical Courses and/or Degree Major Courses for Network Systems	SAMPLE Occupations Relating to This Pathway
<i>Interest Inventory Administered and Plan of Study Initiated for all Learners</i>								
SECONDARY	9	English/ Language Arts I	Geometry	Earth or Life or Physical Science	Government & Citizenship/ Geography	All plans of study should meet local and state high school graduation requirements and college entrance requirements including art, health, and physical education. Certain local student organization activities such as BPA, DECA, or SkillsUSA are also important for personal growth and leadership development.	<ul style="list-style-type: none"> IT Exploration Computer Applications I, II, III 	<p>Network Design & Administration:</p> <ul style="list-style-type: none"> ► Communications Analyst ► Data Communications Analyst ► Information Systems Administrator ► Information Systems Operator ► Information Technology Engineer ► Network Consulting Engineer ► Network Pre-Sales Engineer <p>Network:</p> <ul style="list-style-type: none"> ► Administrator ► Analyst ► Architect ► Engineer ► Manager ► Operations Analyst ► Security Analyst ► Specialist ► Technician ► Transport Administrator PC Support Specialist <p>Systems:</p> <ul style="list-style-type: none"> ► Administrator ► Engineer ► Support Lead ► Technical Support Specialist ► Telecommunications Network Technician ► User Support Specialist
	10	English/ Language Arts II	Algebra II	Biology	U.S. History		<ul style="list-style-type: none"> Business Communications *Computer Technician I & II 	
	11	English/ Language Arts III	Probability & Statistics	Chemistry or Physics or CTE Science Equivalent	World History		<ul style="list-style-type: none"> Advanced Computer Applications Networking Essentials Game Design Mobile Apps 	
	12	English/ Language Arts IV	Math Elective (i.e., Business Math or other CTE Math Equivalent)	Science Elective (i.e., CTE Science Equivalent)	Economics (Ag. Ed./ Bus. Ed./ Social Studies)		<ul style="list-style-type: none"> AP Computer Science Computer Systems Operations 	
<i>College Placement Assessments-Academic/Career Advisement Provided</i>								
<i>Articulation/Dual Credit Transcribed-Postsecondary courses may be taken/moved to the secondary level for articulation/dual credit purposes.</i>								
POSTSECONDARY	Year 1	Transfer Curriculum Goals Determined by Local College Program in College Year 1 and Year 2 - Goal 1: Communication; Goal 2: Critical Thinking/Problem-Solving; Goal 3: Natural Science; Goal 4: Mathematical/Logical Reasoning; Goal 5: History and the Social and Behavior Sciences; Goal 6: The Humanities and the Arts; Goal 7: Human Diversity; Goal 8: Global Perspective; Goal 9: Ethical and Civic Responsibility; Goal 10: People and the Environment			All plans of study need to meet learners' career goals with regard to required degrees, licenses, certifications or journey worker status. Certain local student organization activities such as College BPA, College DECA, or SkillsUSA may also be important to include.	<ul style="list-style-type: none"> Core Classes (e.g., Introduction to Computers, Web Design) 	<ul style="list-style-type: none"> Advanced Classes (e.g. Introduction to Programming, Software Development) Continue Courses in the Area of Specialization Complete Programming and Software Development Major (4-year degree program) 	
	Year 2	**Not all 10 goals are required						
	Year 3	Continue courses in the area of specialization.						
	Year 4							