Regional Occupational Program

Cybersecurity: A+ Certification 2026-2027

COURSE DESCRIPTION

This competency-based course prepares students for entry-level information technology support roles such as computer user support specialist, help desk technician, and computer service technician. Classroom instruction and hands-on lab experiences include computer hardware, mobile devices, operating systems, software installation and configuration, networking fundamentals, troubleshooting, security practices, operational procedures, documentation, and customer support.

Students install, configure, maintain, diagnose, and troubleshoot computer systems and related devices while applying safe work practices, professional communication, and responsible technology-use procedures. Students who achieve competency in this course will build foundational knowledge and hands-on skills aligned to CompTIA A+ certification content and will be prepared to continue toward CompTIA A+ certification.

Course Information

Course Length:	1 Year
Prerequisite:	None
Course Level:	Introductory
UC:	No
Articulated:	No
Industry Cert.:	CompTIA A+ Certification
Industry Sector:	Information and Communication Technologies
Pathway:	Information and Support Services
CALPADS:	8110

O*Net SOC Codes

15-1232	Computer User Support Specialists
15-1231	Computer Network Support Specialists
11-3021	Computer and Information Systems Managers

Legend

CTE - PS	CTE Pathway Standards
CRP	Career Ready Practices
CTE - AS	CTE Anchor Standards
CCSS	Common Core State Standards
ISTE	International Society for Technology in Education

Includes updates from 25/26 ICT Advisory

Advisory Minutes

Cybersecurity: A+ Certification

Course Orientation

a. Discuss objectives for this course, including competencies, teacher expectations, classroom policies, and procedures.
b. Identify and discuss the acquisition of transferable skills (communication, collaboration, creativity, and critical thinking) and their importance to being college and career ready and for future personal and professional success.
c. Review objectives, competencies, and course syllabus.
d. Discuss student and teacher expectations, including behavior, class rules, appropriate dress, pre-course knowledge, and grading policies, including enrollment and attendance requirements and procedures, and classroom/school safety and disaster procedures.
e. Discuss next steps in course sequence related to the career pathway, the need for reinforcement of basic skills, transferrable skills, and postsecondary and career options.
f. Discuss the Big Six: Career Ready Essentials and the Standards for Career Ready Practice as they relate to this course, all aspects of the industry sector, and being college and career ready.

Big Six: Career Ready Essentials

1. Effective Communication	CTE – PS	CRP	CTE - AS	CCSS	ISTE
a. Demonstrate effective verbal communication and conflict resolution skills. **b. Use the writing process to develop written communication with the appropriate tone, organization, and format for the identified audience.** c. Explain the effect of interpersonal skills on one's ability to communicate effectively and develop relationships. d. Describe the impact of ineffective communication on business relationships. e. Analyze the impact of vocabulary, body language, and tone on verbal communication. f. Demonstrate active listening skills. g. Accurately interpret industry-specific written communication. h. Model responsible and effective use of various communication technologies. i. Identify valid and reliable digital reference and resource materials. j. Gather information from multiple digital sources to compare and contrast, synthesize, and summarize. k. Identify and use appropriate communication and collaboration technologies. l. Utilize technology to problem solve, accomplish tasks, and to produce or publish products.		1 2 11	2 3 4 5 7 8 9 10 11	**LS** 9-10 11-12.6 **SLS** 11-12.2 9-10 11-12.1 11-12.1d **WS** 11-12.7 11-12.6	1b,c 2c 3b,c 5c 6b,c,d

2. Collaboration, Creativity, and Critical Thinking	CTE - PS	CRP	CTE - AS	CCSS	ISTE
a. Demonstrate critical thinking skills for a variety of purposes and in different settings. **b. Collaborate to reach consensus on an identical objective through the sharing of knowledge, tasks, and learning.** c. Discuss the importance of the critical thinking process to real-world applications.		2 4 5 7 9	2 3 4 5 7	**LS** 9-10 11- 12.6 **SLS** 9-10	1c 3c,d 4a-d 5c,d 6c

d. Evaluate the impact of creative thinking on problem solving and innovation in real-world applications. e. Compile work that demonstrates the process used to (elaborate, refine, analyze) evaluate original ideas and maximize creative efforts. f. Apply divergent and convergent thinking to the development of an original idea or solution. g. Examine real-world limits to adopting ideas. h. Demonstrate creative thinking (preparation, insight, evaluation, elaboration, and communication) to create a new idea or concept. i. Assume shared responsibility for collaborative work, and value the individual contributions made by each team member. j. Evaluate evidence, arguments, claims, and beliefs to identify connections. k. Identify bias, prejudice, propaganda, self-deception, distortion, and misinformation. l. Produce intellectual, informational, or material products that serve an authentic purpose. m. Work effectively and respectfully with those from diverse backgrounds or cultures. n. Demonstrate respect, trust, commitment, and the ability to compromise in collaborative projects.		10 11	8 9 11	11-12.1 11-12.1d 11-12.2 **WS** 11-12.7 11-12.6	7b,c,d
3. Leaders and Teams: Roles and Responsibilities	**CTE – PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Determine the individual and team members' roles and responsibilities. **b. Demonstrate leadership skills and qualities (i.e., reliability, negotiation skills, initiative, positive reinforcement, recognition of others' efforts, problem-solving skills, conflict resolution, and delegation).** c. Explain the importance of technical, social, and communication skills to team success. d. Compare and contrast leadership styles and their effectiveness in various situations. e. Organize and delegate responsibilities in a team setting to encourage ideas, perspectives, and contributions from all team members. f. Develop a strong sense of team identity by brainstorming solutions, volunteering, assisting others, practicing respect and courtesy, and taking initiative. g. Examine situations in which a follower becomes the leader. h. Describe twenty-first-century skills required across all occupations. i. Identify and discuss the characteristics of a successful team (i.e., leadership, cooperation, and effective decision-making). j. Leverage social and cultural differences to increase innovation and quality of work.		7 8 9	3 7 8 9 11	**SLS** 11-12.2 9-10 11-12.1 11-12.1d **WS** 11-12.6	7a,c
4. Legal, Ethical, and Environmental Considerations	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate industry specific ethical and legal practices. **b. Identify eco-friendly industry specific practices and resources.** c. Identify local, state, and federal regulatory agencies, entities, laws, and regulations.		5 7 8 12	3 5 7 8	**WS** 11-12.6 11-12.7	2a,b 3a,b 5c 6c

d. Identify discrimination based on race, nationality, religion, gender, age, disability, or sexual orientation. e. Summarize the ethical and legal implications of workplace discrimination and harassment. f. Explain the concept of corporate citizenship. g. Examine an employer's role in protecting the health and welfare of employees, the community, and the environment. h. Analyze current environmental laws and regulations and their impact on industry. i. Compare and contrast both society's and industry's impact on the environment.			9 11	**SLS** 9-10 11-12.1 11-12.1d 11-12.2	
5. Personal Growth and Career Planning	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate continued personal development and growth. **b. Develop and manage a personal growth and career plan.** c. Explain the relationship between sound financial habits and financial security. d. Create and manage a personal financial plan. e. Demonstrate initiative in achieving personal and professional goals. f. Apply time management strategies to meet deadlines. g. Demonstrate a growth mindset through flexibility and a positive attitude. h. Select and demonstrate appropriate job-search and retention techniques. i. Demonstrate strategies to prepare for employment. j. Demonstrate interpersonal skills appropriate for the workplace. k. Elaborate on the importance of perseverance to personal and professional success. l. Discover personal career interests, aptitudes, and skills.		1 2 3 4 6	2 3 4 7 8 11	**LS** 9-10 11-12.6 **SLS** 9-10 11-12.1 11-12.1d 11-12.2 **WS** 11-12.6	1a 3a,c 4d 6a,d 7b
6. Workplace Safety and Personal Wellness	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate proper industry specific safe work practices to prevent injury or illness. **b. Assess the potential impact of goal setting on personal and professional success.** c. Describe the role of security and emergency procedures in workplace safety. d. Describe the effect of preventative measures on emergencies in the workplace. e. Identify and describe the causes, prevention, and treatment of common accidents. f. Identify local, state, and federal agencies that regulate workplace safety. g. Explain the role of the California Occupational Safety and Health Administration (Cal-OSHA) and the Environmental Protection Agency (EPA). h. Discuss the basics of system operations. i. Demonstrate the proper use of personal protective equipment (PPE). j. Explain the purpose of and accurately interpret a Safety Data Sheet (SDS). k. Identify hazardous materials and chemicals. l. Demonstrate proper procedures to respond to work-related accidents and injuries.		2 5 6 8 12	2 5 6 7 8 10 11	**LS** 9-10 11-12.6 **WS** 11-12.7 11-12.6 **SLS** 9-10 11-12.1 11-12.1d	1a,d 2a,d 5b

m. Describe how ergonomics, housekeeping, and maintenance are related to accidents and injuries. n. Demonstrate cyber ethics, cyber safety, and cybersecurity. o. Assess the potential impact of preventative physical and mental health measures on workplace safety.					
Cybersecurity: A+ Certification Units of Instruction					
7. The Pathway of the IT Support Technician	**CTE-PS**	**CRP**	**CTE- AS**	**CCSS**	**ISTE**
a. Explain the importance of CompTIA A+ certification for entry-level IT support technicians. b. Describe the CompTIA A+ certification process and its relationship to entry-level IT support roles. c. Identify the major knowledge and skill areas addressed in CompTIA A+ certification content. d. Explain the importance of continuing education, certification renewal, and ongoing technical training for IT support technicians. e. Demonstrate the professional appearance, workplace characteristics, customer-service skills, and communication skills of a successful IT support technician.	A7.3	1 2 3 11	1 2 3	**LS** 9-10 11-12.6 **SLS** 11-12.2	
8. Hardware Installation and Configuration	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate competency installing and configuring computer hardware components and peripherals in desktop, laptop, mobile, and small-office/home-office systems. b. Identify the names, purpose, and characteristics of hardware system modules. c. Explain basic procedures for adding, removing, and replacing field-replaceable or customer-replaceable components for desktop, laptop, and mobile systems. d. Given a replacement scenario, choose the appropriate sequences. e. Identify basic BIOS/UEFI, firmware, driver, and device-management settings used when installing, configuring, or troubleshooting hardware devices. f. Choose the appropriate installation or configuration steps in a given scenario. g. Identify the names, purposes, performance characteristics, and compatibility considerations of common peripheral ports, connectors, cables, and adapters. h. Recognize ports, cabling, and connectors by sight. i. Identify proper procedures for installing and configuring common storage devices, including SATA, NVMe/M.2, external USB storage, and legacy IDE or SCSI devices where appropriate. j. Choose appropriate installation or configuration sequences for storage and peripheral devices and recognize associated data, power, and adapter cables. k. Identify proper procedures for installing and configuring common peripheral devices. l. Choose the appropriate installation or configuration sequences in given scenarios. m. Identify procedures to optimize PC operations in specific situations. n. Predict the effects of specific procedures under given scenarios.	A2.0 A2.3 A4.0 A6.0	1 2 4 5 11	1 2 4 5 10 11	**LS** 9-10 11-12.6 **WS** 11-12.6 11-12.7	

o. Determine the issues that must be considered when upgrading a computer system, including compatibility, performance, power, storage, memory, firmware, operating-system support, and user needs. p. In a given scenario, determine when and how to upgrade system components using appropriate compatibility, safety, documentation, and testing procedures.					
9. Diagnosing, Troubleshooting, and Documentation	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate competency in diagnosing and troubleshooting common computer problems. **b. Use a logical and structured approach to isolate and identify the source of problems and to resolve problems.** c. Recognize common problems associated with each module and their symptoms. d. Use specific problem-solving strategies appropriate to troubleshooting, eliminating possibilities, or guess and check. e. Distinguish types of symptoms and which component's issue could exhibit those symptoms: the user, hardware, network, or software. f. Given a problem situation, interpret the symptoms and infer the most likely cause. g. Identify basic troubleshooting procedures and tools. h. Describe how to gather problem symptoms and relevant information from users or customers using professional questioning and active-listening techniques. i. Justify asking particular questions in a given scenario. j. Explain the importance of documenting findings, actions taken, outcomes, follow-up steps, and resolution details after troubleshooting or repair has been completed.	A6.0 A6.2 A6.3 A7.2	1 2 4 5 11	1 2 4 5 10 11	**LS** 9-10 11-12.6 **WS** 11-12.6 11-12.7	
10. Safety and Preventive Maintenance	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Describe and demonstrate proper preventive maintenance, environmental, and safety procedures for computer systems, peripherals, tools, and work areas. **b. Administer and maintain software and systems.** c. Identify the various types of preventive maintenance measures, products, and procedures and when/how to use them. d. Use different systems and associated utilities to perform such functions as file management, backup and recovery, and execution of programs. e. Use security software, system settings, anti-malware tools, firewalls, updates, and safe-use practices to help protect systems and data from common threats. f. Identify various safety measures and procedures and when/how to use them. g. Demonstrate standard procedures and practices for safely using tools and working safely around the electrical environment in various networking systems. h. Explain employer, environmental, and e-waste procedures for handling or disposing of hazardous materials and components such as batteries, toner cartridges, displays, and legacy CRT monitors.	A4.0 A4.1 A5.0 A5.3 A5.4	1 2 4 5 11 12	1 2 4 5 10 11	**LS** 9-10 11-12.6 **WS** 11-12.6 11-12.7	

i. Compare and contrast antistatic protection devices and describe their purpose. j. Identify the tools in a typical IT support technician's tool kit. k. Identify common safety hazards faced by IT support technicians and describe procedures to reduce risk, including electrical safety, ESD protection, lifting/ergonomics, tool safety, and proper handling of components.					
11. Motherboards, Processors, Firmware, and Memory Systems	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Identify, describe, and troubleshoot motherboards, memory systems, and processor functions. b. Identify the core components of a CPU and its relationship to memory. c. Compare common processor types and characteristics, including cores, clock speed, cache, architecture, compatibility, integrated graphics, and performance considerations. d. Select, install, and troubleshoot a CPU. e. Identify common memory types and characteristics, including DRAM, DDR generations, capacity, speed, form factor, and compatibility. f. Explain the varieties of RAM and install and troubleshoot RAM. g. Identify the most popular types of motherboards, their components, and their architecture (bus structures). h. Upgrade, install, and troubleshoot motherboards. i. Identify the purpose of BIOS/UEFI firmware settings, including boot order, date and time, hardware configuration, virtualization support, security settings, and when configuration changes may be needed. j. Given a scenario involving BIOS/UEFI firmware or system configuration settings, choose the appropriate course of action.	A6.0 A6.2 A6.3 A6.6	1 2 4 5 11	1 2 4 5 10 11	**LS** 9-10 11-12.6 **WS** 11-12.6 11-12.7	
12. Printers	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. Demonstrate competency identifying, configuring, and connecting assorted printers. **b. Describe printer and multifunction device technologies, including laser, inkjet, thermal, impact, and 3D printing where appropriate.** c. Explain the laser printing process, including imaging, charging, exposing, developing, transferring, fusing, and cleaning. d. Describe printer connectivity methods, interfaces, drivers, configuration options, supplies, and upgrade considerations. e. Demonstrate the installation of printers and multifunction devices. f. Recognize common printer and multifunction device problems and apply appropriate troubleshooting, maintenance, and resolution techniques.	A2.3 A6.2	1 2 4 5 11	1 2 4 5 10 11	**LS** 9-10 11-12.6 **WS** 11-12.6 11-12.7	
13. Networking Fundamentals	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**

a. Identify, describe, troubleshoot, and correct basic wired and wireless network connectivity issues. **b. Describe the basic roles of various networked computers.** c. Identify common network media, cables, connectors, and characteristics, including twisted-pair copper, fiber-optic, wireless, and related connector types. d. Explain basic network technologies, including Ethernet, Wi-Fi, IP addressing, DHCP, DNS, and common network services. e. Compare and contrast local area networks (LANs), wide area networks (WANs), and common physical and logical network topologies. f. Identify and describe basic wired and wireless networking concepts including how a network operates. g. Test and maintain wired and wireless network communications components and systems. h. Demonstrate how to troubleshoot wired and wireless networks. i. Identify common internet connectivity methods and their characteristics, including wired broadband, fiber, Wi-Fi, cellular, satellite, and small-office/home-office connections.	A3.0 A3.3 A6.0	1 2 4 5 11	1 2 4 5 10 11	**LS** 9-10 11-12.6 **WS** 11-12.6 11-12.7	
14. Operating System Fundamentals	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. **Identify, describe, and use common components and features of modern operating systems.** b. Identify the major desktop components, interfaces, and their functions. c. Differentiate and describe the characteristics of major desktop, mobile, and open-source operating systems. d. Identify the purpose of common operating-system files, folders, settings, and configuration locations used for basic support and troubleshooting. e. Demonstrate the ability to use command-line functions and utilities to manage the operating system, including the proper syntax and switches. f. Identify basic concepts and procedures for creating, viewing, organizing, securing, and managing storage, folders, files, permissions, and file attributes, including related security considerations. g. Identify and describe the major operating system utilities, their purpose, location, and available switches.	A2.4 A4.2	1 2 4 5 11	1 2 4 5 10 11	**LS** 9-10 11-12.6 **WS** 11-12.6 11-12.7	
15. Operating System Installation, Configuration, and Upgrades	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. **Demonstrate and identify proper procedures for installing, configuring, updating, and upgrading operating systems.** b. Identify procedures for installing modern desktop and mobile operating systems, including Windows, macOS, Linux, ChromeOS, Android, and iOS/iPadOS, and bringing the operating system to a basic operational level.	A2.0 A4.0 A4.1	1 2 4 5 11	1 2 4 5 10 11	**LS** 9-10 11-12.6 **WS** 11-12.6	

c. Identify steps to perform operating-system updates and upgrades for modern operating systems; given an upgrade scenario, choose appropriate next steps. d. Identify basic system boot sequences and boot methods, including recovery media, bootable USB tools, startup repair, recovery environments, and troubleshooting utilities. e. Identify procedures for installing, adding, and configuring devices, including device drivers, firmware, required software, and updates. f. Identify procedures necessary to optimize the operating system and major subsystems.				11-12.7	
16. Operating System Troubleshooting and Support	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. **Demonstrate and describe proper techniques for diagnosing and troubleshooting operating-system issues.** b. Recognize and interpret common error messages, startup issues, boot problems, system logs, and recovery prompts, and identify steps to correct or escalate the problem. c. Use available resources to identify and resolve problems using knowledge bases, forums, and manuals. d. Recognize when to use common diagnostic utilities, recovery tools, system settings, command-line tools, and support resources; given a diagnostic scenario, select appropriate steps to resolve or escalate the problem. e. Recognize and describe common operating-system, application, driver, update, performance, and usability problems and determine appropriate resolution steps.	A6.0 A6.1 A6.2 A6.3	1 2 4 5 11	1 2 4 5 10 11	**LS** 9-10 11-12.6 **WS** 11-12.6 11-12.7	
17. Operating System Networking and Internet Connectivity	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**
a. **Identify and configure basic networking and internet connectivity settings in Windows and other common operating systems where appropriate.** b. Identify common operating-system networking capabilities, including wired and wireless connections, network profiles, sharing settings, VPN connections, and basic firewall settings. c. Given configuration parameters, configure an operating system to connect to a wired, wireless, or small-office/home-office network. d. Identify basic internet protocols and terminology, including TCP/IP, HTTP/HTTPS, DNS, DHCP, VPN, and Wi-Fi security terms. e. Identify procedures for establishing Internet connectivity. f. In a given scenario, configure an operating system to connect to and use internet and cloud-based resources securely.	A3.5	1 2 4 5 11	1 2 4 5 11	**LS** 9-10 11-12.6 **WS** 11-12.6 11-12.7	
18. Mobile Devices	**CTE - PS**	**CRP**	**CTE - AS**	**CCSS**	**ISTE**

a. **Explain the features and capabilities of mobile devices, including smartphones, tablets, laptops, wearable devices, and related peripherals.** b. Identify common mobile operating systems and platforms, including Android, iOS/iPadOS, and other mobile or embedded operating systems where appropriate. c. Describe how to configure mobile devices, including network connectivity, accounts, applications, synchronization, updates, accessibility settings, and security settings. d. Compare and contrast features, compatibility, security settings, app management, and support considerations across common mobile operating systems and platforms. e. Demonstrate how to troubleshoot common mobile device issues. f. Explain basic mobile device security practices, including screen locks, authentication, encryption, updates, app permissions, device location, remote wipe, and safe connectivity. g. Describe typical mobile application troubleshooting issues.	A2.0 A5.0 A6.0	1 2 4 5 11	1 2 4 5 10 11	**LS** 9-10 11-12.6 **WS** 11-12.6 11-12.7	

Standards Alignment

The curricula have been aligned with the CTE Model Curriculum Standards released in 2013. Each industry sector was updated to meet the increased rigor and relevancy requirements of the Common Core State Standards. The curriculum also includes the new Standards for Career Ready Practices.

Standards for Career Ready Practice

1. *Apply appropriate technical skills and academic knowledge.*
2. *Communicate clearly, effectively, and with reason.*
3. *Develop an education and career plan aligned with personal goals.*
4. *Apply technology to enhance productivity.*
5. *Utilize critical thinking to make sense of problems and persevere in solving them.*
6. *Practice personal health and understand financial literacy.*
7. *Act as a responsible citizen in the workplace and the community.*
8. *Model integrity, ethical leadership, and effective management.*
9. *Work productively in teams while integrating cultural and global competence.*
10. *Demonstrate creativity and innovation.*
11. *Employ valid and reliable research strategies.*
12. *Understand the environmental, social, and economic impacts of decisions.*

CTE Anchor Standards—Common Core English Language Arts Alignment

Anchor Standard 1: Academics

Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the industry sector alignment matrix for identification of standards. Note: alignment listed within each sector.

Anchor Standard 2: Communications

Language Standard: Acquire and accurately use general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the (career and college) readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. LS 9-10, 11-12.6

Anchor Standard 3: Career Planning and Management

Speaking and Listening Standard: Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. SLS 11-12.2

Anchor Standard 4: Technology

Writing Standard: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments and information.

Anchor Standard 5: Problem Solving and Critical Thinking

Writing Standard: Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem, narrow, or broaden the inquiry when appropriate, and synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. WS 11-12.7

Anchor Standard 6: Health and Safety

Reading Standards for Science and Technical Subjects: Determine the meaning of symbols, keywords, and other domain-specific words and phrases as they are used in a specific scientific or technical context. RSTS 9-10, 11-12.4

Anchor Standard 7: Responsibility and Flexibility

Speaking and Listening Standard: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners, building on others' ideas and expressing their own clearly and persuasively. SLS 9-10, 11-12.1

Anchor Standard 8: Ethics and Legal Responsibilities

Speaking and Listening Standard: Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the work. SLS 11-2.1d

Anchor Standard 9: Leadership and Teamwork

Speaking and Listening Standard: Work with peers to promote civil, democratic discussions and decision making; set clear goals and deadlines; and establish individual roles as needed. SLS 11-12.1b

Anchor Standard 10: Technical Knowledge and Skills

Writing Standard: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. WS 11-12.6

Anchor Standard 11: Demonstration and Application

Demonstrate and apply the knowledge and skills contained in the industry-sector anchor standards, pathway standards, and performance indicators in the classroom, laboratory, and workplace settings, and the career technical student organization. Note: no alignment evident for this standard. WS 11-12.6

CTE Model Curriculum Standards—Industry Sectors and Pathways

Information Support and Services Pathway

A. Information Support and Services Pathway

A2.0 Acquire, install, and implement software and systems.

A2.3 Install software and setup hardware.

A2.4 Define and use appropriate naming conventions and file management strategies.

A3.0 Access and transmit information in a networked environment.

A3.3 Recognize where processes are running in a networked environment (e.g., client access, remote access).

A3.5 Use multiple online search techniques and resources to acquire information.

A4.0 Administer and maintain software and systems.

A4.1 Use different systems and associated utilities to perform such functions as file management, backup and recovery, and execution of programs.

A4.2 Use a command line interface.

A5.0 Identify requirements for maintaining secure network systems.

A5.3 Take preventative measures to reduce security risks (e.g., strong passwords, avoid social engineering ploys, limit account permissions).

A5.4 Use security software and hardware to protect systems from attack and alert of potential threats, anti-malware software, and firewalls.

A6.0 Diagnose and solve software, hardware, networking, and security problems.

A6.1 Use available resources to identify and resolve problems using knowledge bases, forums, and manuals.

A6.2 Use a logical and structured approach to isolate and identify the source of problems and to resolve problems.

A6.3 Use specific problem-solving strategies appropriate to troubleshooting, eliminating possibilities, or guess and check.

A6.6 Distinguish types of symptoms and which component's issue could exhibit those symptoms: the user, hardware, network, or software.

A7.2 Describe and apply the principles of a customer-oriented service approach to supporting users.

A7.3 Use technical writing and communication skills to work effectively with diverse groups of people, including users with less technical abilities.

ISTE Standards for Students

1. Empowered Learner- Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.

a) Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes.

b) Students build networks and customize their learning environments in ways that support the learning process.

c) Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways

d) Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

2. Digital Citizen- Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.

a) Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.

b) Students engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices.

c) Students demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

d) Students manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

3.Knowledge Constructor- Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.

a) Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

b) Students evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources.

c) Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

d Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions.

4. Innovative Designer- Students use a variety of technologies within a design process to identify and solve problems creating new, useful, or imaginative solutions.

a) Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems.

b) Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

c) Students develop, test, and refine prototypes as part of a cyclical design process.

d) Students exhibit a tolerance for ambiguity, perseverance, and the capacity to work with open-ended problems.

5. Computational Thinker- Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

a) Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.

b) Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

c) Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

d) Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

6. Creative Communicator- Students communicate clearly and express themselves creatively for a variety of purposes using platforms, tools, styles, formats, and digital media appropriate for their goals.

a) Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

b) Students create original works or responsibly repurpose or remix digital resources into new creations.

c) Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations.

d) Students publish or present content that customizes the message and medium for their intended audiences.

7. Global Collaborator- Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

a) Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

b) Students use collaborative technologies to work with others, including peers, experts, or community members, to examine issues and problems from multiple viewpoints.

c) Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

d) Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.