



Regional Occupational Program

Cyber Security A+ Certification 2025-2026

COURSE DESCRIPTION

This competency-based course prepares students for entry-level positions common in the computer maintenance and repair field such as a computer support specialist and computer service technician. Classroom instruction and practical experience will include installation and configuration of various components, diagnostics, operating systems, and software. Students achieving competency in this course will be prepared to take the A+ Certification exams in both hardware and operating systems.

Course Information

Course Length: 1 Year
 Prerequisite: None
 Course Level: Introductory
 UC: No
 Articulated: No
 Industry Cert.: 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 24/25 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
<ol style="list-style-type: none"> 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. 		<u>1</u> <u>2</u> <u>11</u>	<u>2</u> <u>3</u> <u>4</u> <u>5</u> <u>7</u> <u>8</u> <u>9</u> <u>10</u> <u>11</u>	<u>LS</u> <u>9-10</u> <u>11-12.6</u> <u>SLS</u> <u>11-12.2</u> <u>9-10</u> <u>11-12.1</u> <u>11-12.1d</u> <u>WS</u> <u>11-12.7</u> <u>11-12.6</u>	<u>1b,c</u> <u>2c</u> <u>3b,c</u> <u>5c</u> <u>6b,c,d</u>
2. Collaboration, Creativity, and Critical Thinking	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ol style="list-style-type: none"> 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. 		<u>2</u> <u>4</u> <u>5</u>	<u>2</u> <u>3</u> <u>4</u>	<u>LS</u> <u>9-10</u> <u>11-12.6</u>	<u>1c</u> <u>3c,d</u> <u>4a-d</u>

<ul style="list-style-type: none"> c. Discuss the importance of the critical thinking process to real-world applications. 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. 		<u>7</u> <u>9</u> <u>10</u> <u>11</u>	<u>5</u> <u>7</u> <u>8</u> <u>9</u> <u>11</u>	<u>SLS</u> <u>9-10</u> <u>11-12.1</u> <u>11-12.1d</u> <u>11-12.2</u> <u>WS</u> <u>11-12.7</u> <u>11-12.6</u>	<u>5c,d</u> <u>6c</u> <u>7b,c,d</u>
3. Leaders and Teams: Roles and Responsibilities	CTE – PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> 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. 		<u>7</u> <u>8</u> <u>9</u>	<u>3</u> <u>7</u> <u>8</u> <u>9</u> <u>11</u>	<u>SLS</u> <u>11-12.2</u> <u>9-10</u> <u>11-12.1</u> <u>11-12.1d</u> <u>WS</u> <u>11-12.6</u>	<u>7a,c</u>
4. Legal, Ethical, and Environmental Considerations	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> 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. 		<u>5</u> <u>7</u> <u>8</u>	<u>3</u> <u>5</u> <u>7</u>	<u>WS</u> <u>11-12.6</u> <u>11-12.7</u>	<u>2a,b</u> <u>3a,b</u> <u>5c</u>

<ul style="list-style-type: none"> 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. 		<u>12</u>	<u>8</u> <u>9</u> <u>11</u>	<u>SLS</u> <u>9-10</u> <u>11-12.1</u> <u>11-12.1d</u> <u>11-12.2</u>	<u>6c</u>
5. Personal Growth and Career Planning	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> 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. 		<u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>6</u>	<u>2</u> <u>3</u> <u>4</u> <u>7</u> <u>8</u> <u>11</u>	<u>LS</u> <u>9-10</u> <u>11-12.6</u> <u>SLS</u> <u>9-10</u> <u>11-12.1</u> <u>11-12.1d</u> <u>11-12.2</u> <u>WS</u> <u>11-12.6</u>	<u>1a</u> <u>3a,c</u> <u>4d</u> <u>6a,d</u> <u>7b</u>
6. Workplace Safety and Personal Wellness	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> 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. 		<u>2</u> <u>5</u> <u>6</u> <u>8</u> <u>12</u>	<u>2</u> <u>5</u> <u>6</u> <u>7</u> <u>8</u> <u>10</u> <u>11</u>	<u>LS</u> <u>9-10</u> <u>11-12.6</u> <u>WS</u> <u>11-12.7</u> <u>11-12.6</u> <u>SLS</u> <u>9-10</u> <u>11-12.1</u> <u>11-12.1d</u>	<u>1a,d</u> <u>2a,d</u> <u>5b</u>

<p>m. Describe how ergonomics, housekeeping, and maintenance are related to accidents and injuries.</p> <p>n. Demonstrate cyber ethics, cyber safety, and cybersecurity.</p> <p>o. Assess the potential impact of preventative physical and mental health measures on workplace safety.</p>					
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Cybersecurity A+ Certification Units of Instruction

7. The Pathway of the PC Technician	CTE-PS	CRP	CTE- AS	CCSS	ISTE
<p>a. Explain the importance of A+ certifications for Computer Technicians.</p> <p>b. Describe the A+ certification process for PC Technicians.</p> <p>c. List the domains addressed in the A+ certification tests.</p> <p>d. Explain the importance of continuing education and training for PC Technicians.</p> <p>e. Demonstrate professional appearance, characteristics, and communication skills of a successful PC Technician.</p>	A7.3	<u>1</u> <u>2</u> <u>3</u> <u>11</u>	<u>1</u> <u>2</u> <u>3</u>	LS 9-10 11-12.6 SLS 11-12.2	
8. Installation and Configuration	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<p>a. Demonstrate competency installing and configuring assorted hardware within various systems.</p> <p>b. Identify the names, purpose, and characteristics of hardware system modules.</p> <p>c. Explain basic procedures for adding and removing field-replaceable modules for desktop and portable systems.</p> <p>d. Given a replacement scenario, choose the appropriate sequences.</p> <p>e. Identify typical IRQs, DMAs, and I/O addresses and procedures for altering these settings when installing and configuring devices.</p> <p>f. Choose the appropriate installation or configuration steps in a given scenario.</p> <p>g. Identify the names, purposes and performance characteristics of standardized/common peripheral ports and associated cabling.</p> <p>h. Recognize ports, cabling, and connectors by sight.</p> <p>i. Identify proper procedures for installing and configuring common IDE and SCSI devices.</p> <p>j. Choose the appropriate installation or configuration sequences in given scenarios; recognize the associated cables.</p> <p>k. Identify proper procedures for installing and configuring common peripheral devices.</p> <p>l. Choose the appropriate installation or configuration sequences in given scenarios.</p> <p>m. Identify procedures to optimize PC operations in specific situations.</p> <p>n. Predict the effects of specific procedures under given scenarios.</p> <p>o. Determine the issues that must be considered when upgrading a PC.</p> <p>p. In a given scenario, determine when and how to upgrade system components.</p>	A2.0 A2.3 A4.0 A6.0	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>11</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</u> <u>11</u>	LS 9-10 11-12.6 WS 11-12.6 11-12.7	

9. Diagnosing and Troubleshooting	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<p>a. Demonstrate competency in diagnosing and troubleshooting common computer problems.</p> <p>b. Use a logical and structured approach to isolate and identify the source of problems and to resolve problems.</p> <p>c. Recognize common problems associated with each module and their symptoms.</p> <p>d. Use specific problem-solving strategies appropriate to troubleshooting, eliminating possibilities, or guess and check.</p> <p>e. Distinguish types of symptoms and which component's issue could exhibit those symptoms: the user, hardware, network, or software.</p> <p>f. Given a problem situation, interpret the symptoms and infer the most likely cause.</p> <p>g. Identify basic troubleshooting procedures and tools.</p> <p>h. Describe how to elicit problem symptoms from customers.</p> <p>i. Justify asking particular questions in a given scenario.</p> <p>j. Explain the importance of documenting findings, actions, outcomes, and follow up after a repair has been completed.</p>	A6.0 A6.2 A6.3 A7.2	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>11</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</u> <u>11</u>	LS 9-10 11-12.6 WS 11-12.6 11-12.7	
10. Safety and Preventative Maintenance	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<p>a. Describe and demonstrate proper preventive maintenance, environmental, and safety procedures.</p> <p>b. Administer and maintain software and systems.</p> <p>c. Identify the various types of preventive maintenance measures, products, and procedures and when/how to use them.</p> <p>d. Use different systems and associated utilities to perform such functions as file management, backup and recovery, and execution of programs.</p> <p>e. Use security software and hardware to protect systems from attack and alert of potential threats, anti-malware software, and firewalls.</p> <p>f. Identify various safety measures and procedures and when/how to use them.</p> <p>g. Demonstrate standard procedures and practices for safely using tools and working safely around the electrical environment in various networking systems.</p> <p>h. Explain employer and environmental rules for hazardous toxic materials such as CRT monitors, batteries, and toner cartridges.</p> <p>i. Compare and contrast antistatic protection devices and describe their purpose.</p> <p>j. Identify the tools in a typical PC technician's tool kit.</p> <p>k. Name some of the dangers commonly faced by PC technicians and describe how to avoid them.</p>	A4.0 A4.1 A5.0 A5.3 A5.4	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>11</u> <u>12</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</u> <u>11</u>	LS 9-10 11-12.6 WS 11-12.6 11-12.7	
11. Motherboards, Processors, and Memory Systems	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<p>a. Identify, describe, and troubleshoot motherboards, memory systems, and processor functions.</p>	A6.0 A6.2	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>	LS 9-10	

<ul style="list-style-type: none"> b. Identify the core components of a CPU and its relationship to memory. c. Describe the difference in popular modern CPU chips by their basic characteristics. d. Select, install, and troubleshoot a CPU. e. Identify the types of DRAM (Dynamic Random-Access Memory). 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 CMOS (Complementary Metal-Oxide Semiconductor) memory, what it contains, and how/when to change its parameters. j. Given a scenario involving CMOS, choose the appropriate course of action. 	A6.3 A6.6	<u>4</u> <u>5</u> <u>11</u>	<u>4</u> <u>5</u> <u>10</u> <u>11</u>	11-12.6 WS 11-12.6 11-12.7	
12. Printers	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate competency identifying, configuring, and connecting assorted printers. b. Describe printers and multifunction device technologies. Explain the laser printing process. c. Describe printer interfaces and options/upgrades. d. Demonstrate the installation of printers and multifunction devices. e. Recognize common printer and multifunction device problems and techniques used to resolve them. 	A2.3 A6.2	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>11</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</u> <u>11</u>	LS 9-10 11-12.6 WS 11-12.6 11-12.7	
13. Computer Networking	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Identify, describe, troubleshoot, and correct basic network errors. b. Describe the basic roles of various networked computers. c. Identify the common types of network cables, their characteristics, and connectors. d. Explain network technologies and Ethernet. e. Compare and contrast between the topologies of local area networks (LAN) and wide area networks (WAN). 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 technologies available for establishing Internet connectivity and their characteristics. 	A3.0 A3.3 A6.0	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>11</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</u> <u>11</u>	LS 9-10 11-12.6 WS 11-12.6 11-12.7	
14. Operating System Fundamentals	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Identify, describe, and use components of an operating system. b. Identify the major desktop components, interfaces, and their functions. c. Differentiate and describe the characteristics of major operating systems. 	A2.4 A4.2	<u>1</u> <u>2</u> <u>4</u>	<u>1</u> <u>2</u> <u>4</u>	LS 9-10 11-12.6	

<ul style="list-style-type: none"> d. Identify the names, locations, purposes, and contents of major system files. 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, and managing disks, directories, and files including procedures for changing file attributes and the ramifications of those changes (for example, security issues). g. Identify and describe the major operating system utilities, their purpose, location, and available switches. 		<u>5</u> <u>11</u>	<u>5</u> <u>10</u> <u>11</u>	<u>WS</u> <u>11-12.6</u> <u>11-12.7</u>	
15. Installation, Configuration and Upgrading Systems	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate and identify the proper procedures for installing, configuring, and upgrading operating systems. b. Identify the procedures for installing modern operating systems (Microsoft, Apple, and Linux...) bringing the operating system to a basic operational level. c. Identify steps to perform an operating system upgrade for modern operating systems (Microsoft, Apple, and Linux ...). Given an upgrade scenario, choose the appropriate next steps. d. Identify the basic system boot sequences and boot methods, including the steps to create an emergency boot disk with utilities installed for Microsoft operating systems. e. Identify procedures for installing/adding a device, including loading, adding, and configuring device drivers and required software. f. Identify procedures necessary to optimize the operating system and major subsystems. 	<u>A2.0</u> <u>A4.0</u> <u>A4.1</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>11</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</u> <u>11</u>	<u>LS</u> <u>9-10</u> <u>11-12.6</u> <u>WS</u> <u>11-12.6</u> <u>11-12.7</u>	
16. Diagnosing and Troubleshooting Operating Systems	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate and describe the proper techniques for diagnosing and troubleshooting operating systems. b. Recognize and interpret the meaning of common error codes and startup messages from the boot sequence and identify steps to correct the problems. c. Use available resources to identify and resolve problems using knowledge bases, forums, and manuals. d. Recognize when to use common diagnostic utilities and tools. Given a diagnostic scenario involving one of these utilities or tools, select the appropriate steps needed to resolve the problem. e. Recognize and describe common operational and usability problems and determine how to resolve them. 	<u>A6.0</u> <u>A6.1</u> <u>A6.2</u> <u>A6.3</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>11</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</u> <u>11</u>	<u>LS</u> <u>9-10</u> <u>11-12.6</u> <u>WS</u> <u>11-12.6</u> <u>11-12.7</u>	
17. Windows Networking	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Identify and configure the networking and Internet capabilities of Windows. b. Identify the networking capabilities of Windows. 	<u>A3.5</u>	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>	<u>LS</u> <u>9-10</u>	

<ul style="list-style-type: none"> c. Given configuration parameters, configure the operating system to connect to a network. d. Identify the basic internet protocols and terminologies. e. Identify procedures for establishing Internet connectivity. f. In a given scenario, configure the operating system to connect to and use Internet resources. 		<u>4</u> <u>5</u> <u>11</u>	<u>4</u> <u>5</u> <u>11</u>	<u>11-12.6</u> WS <u>11-12.6</u> <u>11-12.7</u>	
18. Mobile Devices	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Explain the features and capabilities of mobile devices. b. Identify the three major mobile OSs. c. Describe how to configure mobile devices. d. Compare and contrast features among the three mobile OS competitors. e. Demonstrate how to troubleshoot common mobile device issues. f. Explain basic mobile device security and troubleshooting. g. Describe typical mobile application troubleshooting issues. 	<u>A2.0</u> <u>A5.0</u> <u>A6.0</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>11</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</u> <u>11</u>	<u>LS</u> <u>9-10</u> <u>11-12.6</u> WS <u>11-12.6</u> <u>11-12.7</u>	

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 11-12.1d

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.