



Regional Occupational Program

Cybersecurity 2: Network+ A-G 2025-2026

COURSE DESCRIPTION

Cybersecurity 2 prepares students for post-secondary success in the cybersecurity field. In this course students engage with studies of the history and implications of network communications; the network protocols which make the internet possible; how networks provide access to services and communicate with one another, methods used to increase scalability, reliability, and security in the modern network, and the Internet of Things (IOT). Students targeting a cybersecurity career aligned with the Department of Defense (DoD) or Government related service can take this course to prepare for the CompTIA Network+ and CompTIA Security+ Certifications, to meet DoD 8140 cyber security workforce requirements.

Course Information:

Course Length: 1 Year
 Prerequisite: None
 Course Level: Concentrator
 UC: Yes G - Elective
 Articulated: No
 Industry Cert.: CompTIA Network+
 Industry Sector: Information & Communication Technologies
 Pathway: Information Support Services
 CALPADS: 8111

O*Net SOC Codes:

15-1231 Computer Network Support Specialists
 15-1241 Computer Network Architects
 15-1244 Network and Computer Systems Administrators

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 2: Network+

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. 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. 		<u>2</u> <u>4</u> <u>5</u> <u>7</u> <u>9</u> <u>10</u>	<u>2</u> <u>3</u> <u>4</u> <u>5</u> <u>7</u> <u>8</u>	<u>LS</u> <u>9-10</u> <u>11- 12.6</u> <u>SLS</u> <u>9-10</u>	<u>1c</u> <u>3c,d</u> <u>4a-d</u> <u>5c,d</u> <u>6c</u> <u>7b,c,d</u>

<ul style="list-style-type: none"> 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>11</u>	<u>9</u> <u>11</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>	
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. d. Identify discrimination based on race, nationality, religion, gender, age, disability, or sexual orientation. 		<u>5</u> <u>7</u> <u>8</u> <u>12</u>	<u>3</u> <u>5</u> <u>7</u> <u>8</u> <u>9</u>	<u>WS</u> <u>11-12.6</u> <u>11-12.7</u> <u>SLS</u>	<u>2a,b</u> <u>3a,b</u> <u>5c</u> <u>6c</u>

<ul style="list-style-type: none"> 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>11</u>	<u>9-10</u> <u>11-12.1</u> <u>11-12.1d</u> <u>11-12.2</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. m. Describe how ergonomics, housekeeping, and maintenance are related to accidents and injuries. n. Demonstrate cyber ethics, cyber safety, and cybersecurity. 		<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>

o. Assess the potential impact of preventative physical and mental health measures on workplace safety.					
Cybersecurity 2: Network+ Units of Instruction					
7. Understanding Local Area Networking	CTE-PS	CRP	CTE- AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate the ability to understand the fundamentals of local area networks (LAN) and how to install a LAN. b. Identify local area networks, devices, and data transfer. c. Identify network topologies and standards. 	A3.0 A3.3	<u>1</u> <u>2</u> <u>4</u> <u>5</u>	<u>1</u> <u>2</u> <u>4</u> <u>10</u> <u>11</u>	LS 9-10 11-12.6 WS 11-12.6	
8. Defining Networks with the OSI Model	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate an understanding of the Open Systems Interconnection (OSI) model layers and how it defines data communications on a network. b. Define the OSI layers. c. Define the communications sub-network. 	A3.5	<u>1</u> <u>2</u> <u>4</u> <u>5</u>	<u>1</u> <u>2</u> <u>4</u> <u>10</u> <u>11</u>	LS 9-10 11-12.6 WS 11-12.6	
9. Understanding Wired and Wireless Networks	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate an understanding of network tools, cabling, and equipment necessary to set up wired and wireless networks. b. Identify wired networks and media types. c. Demonstrate the ability to install and configure a wireless network. 	A2.0 A2.3	<u>1</u> <u>2</u> <u>4</u> <u>5</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. Understanding Internet Protocols	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate the ability to enable computers on a local area network to communicate through layer 3 IP addressing using IPv4 and IPv6 protocols. b. Demonstrate the ability to work with IPv4. c. Demonstrate the ability to work with IPv6. 	A 3.6	<u>1</u> <u>2</u> <u>4</u> <u>5</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. Implementing TCP/IP in the Command Line	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate the ability to quickly implement TCP/IP commands using the Windows command line prompt. 	A4.2	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>	LS 9-10	

<ul style="list-style-type: none"> b. Demonstrate the ability to use basic TCP/IP commands. c. Demonstrate the ability to use advanced TCP/IP commands. 		<u>4</u> <u>5</u>	<u>4</u> <u>5</u> <u>10</u> <u>11</u>	<u>11-12.6</u> <u>WS</u> <u>11-12.6</u> <u>11-12.7</u>	
12. Working with Networking Services	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate the ability to install and configure DHCP, DNS, and WINS terminal services. b. Demonstrate an ability to set up common networking services. c. Identify network services. d. Identify and define naming resolution techniques. 	<u>A2.4</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</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>	
13. Understanding Wide Area Networks	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate the ability to install Wide Area Network technologies and configure networking services and protocols. b. Install and configure routers. c. Identify and define common WAN technologies and connections. 	<u>A2.0</u> <u>A2.3</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</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>	
14. Defining Network Infrastructure and Network Security	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate the ability to secure a network using VPNs, intranets, extranets, and security devices such as firewalls. b. Identify networks outside of the LAN. c. Demonstrate the ability to configure security devices and zones. 	<u>A5.0</u> <u>A5.3</u> <u>A5.4</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</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>	
15. Planning, Installing, and Configuring Windows Server 2012	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate the ability to plan, install, and configure Windows Server 2012. b. Describe the features and capabilities of Windows Server 2012. c. Describe Windows Server 2012 Management. 	<u>A2.0</u> <u>A2.3</u> <u>A8.0</u> <u>A8.1</u> <u>A8.2</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</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. Installing and Configuring an Active Directory Domain Controller	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate the ability to install and configure server roles through the Active Directory domain controller and related services and functions within Windows Server 2012. 	<u>A2.0</u> <u>A5.0</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"> b. Describe Active Directory. c. Install Active Directory Domain Controller. 	A5.1	<u>4</u> <u>5</u>	<u>4</u> <u>5</u> <u>10</u> <u>11</u>	11-12.6 WS 11-12.6 11-12.7	
17. Administering Active Directory Objects	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate the ability to design an Active Directory hierarchy and then create and administer Active Directory objects. b. Manager user accounts. c. Join computer domains to create their computer accounts. d. Manage group accounts. e. Delegate Active Directory tasks. 	A4.0 A5.0	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</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	
18. Automating Administrative Tasks	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate the ability to implement the Windows PowerShell and standard command line utility as an alternative to manual navigation around a b. GIU interface so that the user can simplify and automate routine administrative tasks. c. Demonstrate the ability to use Windows PowerShell to manage Active Directory objects. d. Use command line tools to administer Active Directory. e. Use bulk operations. 	A4.1 A4.2 A4.3 B4.0	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</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	
19. Configuring Group Policy	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate the ability to simplify administrative tasks related to security. b. Create Group Policy Objects. c. Demonstrate the ability to implement a Central Store. 	A4.3 A5.2	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</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	
20. Securing Windows Servers	CTE - PS	CRP	CTE - AS	CCSS	ISTE
<ul style="list-style-type: none"> a. Demonstrate the ability to protect network communications from unauthorized access and malicious actions. b. Configure Windows Server user security. c. Configure Windows Firewall. 	A5.0 A5.3 A5.4	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</u>	<u>1</u> <u>2</u> <u>4</u> <u>5</u> <u>10</u>	LS 9-10 11-12.6 WS 11-12.6 11-12.7	

A-G Approved Key Assignments

1.	Password Vulnerability: Students will create a password using ECHO command and trace it to its last memory address using DeBug. Students write a reflective journal that addresses the objective, the process, and its relationship to online safety. <i>Unit(s) 7, 8, 9, 10, 11, 12, 13</i>
2.	Router Web Access: Students will check DHCP client list on a router to identify computers and mobile devices (phones, tablets, etc.) in the local area. This activity aligns with NSA Knowledge Unit 1.6. <i>Unit(s) 7, 8, 9, 10, 11, 12, 13</i>
3.	Purge Script: Students will create a script to purge temporary caches automatically when the system shuts down. Student groups reflect and capture the objective(s), the process, and the real-life application in their journals. <i>Unit(s) 14, 15, 16, 17, 18</i>
4.	Students will create an application capable of sending/receiving remote messages and files. <i>Unit(s) 16, 17, 18, 19, 20</i>
5.	Students will use VB.Net to create a network scanner to graphically display computers that are on and off. <i>Unit(s) 16, 17, 18, 19, 20</i>
6.	Students will scan TCP and UDP ports for real-time system intrusion and identify the intruder's MAC address (i.e. netstat, arp, NBT stat). <i>Unit(s) 16, 17, 18, 19, 20</i>
7.	Rogue laptop: Students will track and identify a “rogue” laptop that keeps changing names and IP addresses across multiple domains (e.g. scanner, arp, nbtstat, etc.). <i>Unit(s) 9, 10, 11, 16</i>
8.	Stolen laptop: Students will identify a “stolen” laptop on the Internet and trace it to its last known latitude and longitude (e.g. ArcExplorer, Google Earth, tracert, finger). Aligns to NSA Knowledge Unit 1.4. <i>Unit(s) 9, 10, 11, 16</i>

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 and Communication Technologies

A. Information Support and Services Pathway

- A2.0 *Acquire, install, and implement software and systems.*
- A2.3 *Install software and setup hardware.*
- 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).*
- A3.4 *Identify and describe the layered nature of computing and networking such as the Open Systems Interconnect (OSI) model.*
- A3.6 *Describe and contrast the differences between various Internet protocols: hypertext transfer protocol (http), hypertext transfer protocol secure (https), file transfer protocol (ftp), simple mail transfer protocol (smtp).*
- 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.*
 - A4.3 *Automate common tasks using macros or scripting.*
- A5.0 *Identify requirements for maintaining secure network systems.*
 - A5.1 *Follow laws, regulatory guidelines, policies, and procedures to ensure the security and integrity of information systems.*
 - A5.2 *Identify potential attack vectors and security threats.*
 - 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.*
- A8.0 *Manage and implement information, technology, and communication projects.*
 - A8.1 *Develop the purpose and scope of a project.*
 - A8.2 *Acquire, use, and manage necessary internal and external resources when supporting various organizational systems.*

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 understand 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.