

CYBERSECURITY STANDARDS



This document was prepared by:

Office of Career Readiness, Adult Learning & Education Options
Nevada Department of Education
755 N. Roop Street, Suite 201
Carson City, NV 89701

www.doe.nv.gov

Adopted by the Nevada State Board of Education on
January 18, 2018

The Nevada Department of Education does not discriminate on the basis of race, color, religion, national origin, sex, disability, sexual orientation, gender identity or expression, or age in its programs and activities and provides equal access to the Boy Scouts and other designated youth groups.

For inquiries, contact the Equity Coordinator at (775) 687-9200.

NEVADA STATE BOARD OF EDUCATION

Elaine Wynn..... President
 Mark NewburnVice President
 Robert BlakelyMember
 David Carter.....Member
 Tonia Holmes-Sutton.....Member
 Dave Jensen.....Member
 Cathy McAdooMember
 Dawn MillerMember
 Felicia Ortiz.....Member
 Hunter Drost..... Student Representative

NEVADA DEPARTMENT OF EDUCATION

Steve Canavero, Ph.D.
 Superintendent of Public Instruction

Kristine Nelson, Director
 Office of Career Readiness, Adult Learning & Education Options

VISION

All Nevadans ready for success in the 21st century

MISSION

To improve student achievement and educator effectiveness by ensuring opportunities, facilitating learning, and promoting excellence



TABLE OF CONTENTS

Nevada State Board of Education / Nevada Department of Education	iii
Acknowledgements / Standards Development Members / Business and Industry Validation / Project Coordinator	vii
Introduction.....	ix
Content Standard 1.0 – Safety Procedures and Proper Use of Tools	1
Content Standard 2.0 – Understand Technical, Legal, and Ethical Issues.....	2
Content Standard 3.0 – Understand Hardware Components.....	3
Content Standard 4.0 – Understand Operating Systems.....	4
Content Standard 5.0 – Understand Industry Standards, Practices, and Network Theory	6
Content Standard 6.0 – Understand Networking	7
Content Standard 7.0 – Understand Network Operations	9
Content Standard 8.0 – Understand the Cybersecurity Lifecycle	11
Content Standard 9.0 – Understand Computer Forensics Concepts	12
Content Standard 10.0 – Understand Emerging Technologies	14
Crosswalks and Alignments.....	15

ACKNOWLEDGEMENTS

The development of Nevada career and technical standards and assessments is a collaborative effort sponsored by the Office of Career Readiness, Adult Learning & Education Options at the Department of Education and the Career and Technical Education Consortium of States. The Department of Education relies on teachers and industry representatives who have the technical expertise and teaching experience to develop standards and performance indicators that truly measure student skill attainment. Most important, however, is recognition of the time, expertise and great diligence provided by the writing team members in developing the career and technical standards for Cybersecurity.

STANDARDS DEVELOPMENT MEMBERS

Fran Bromley-Norwood	Teacher	Cheyenne High School, Las Vegas
Samuel W. Cornelius	Industry	Code Central
Wayne Davies	Teacher	Southwest Career and Technical Academy, Las Vegas
Greg Ellis	Instructor	Truckee Meadows Community College, Reno
Matt Heffelfinger	Senior Manager	Sands Corporation
Dan Manson, Ph.D.	Professor	Cal Poly Pomona
Melissa Perrin-Smith	Teacher	Advanced Technologies Academy, Las Vegas
Arthur Salmon	Instructor	College of Southern Nevada, Las Vegas
Michael Seal	Teacher	Silver Stage High School, Silver Springs
Daniel Slentz	Industry	Oasis Online Consulting
Margaret Taylor	CIT Department Chair	College of Southern Nevada, Las Vegas
Scott Waber	IT Supervisor	City of Las Vegas

BUSINESS AND INDUSTRY VALIDATION

All CTE standards developed through the Nevada Department of Education are validated by business and industry through one or more of the following processes: (1) the standards are developed by a team consisting of business and industry representatives; or (2) a separate review panel was coordinated with industry experts to ensure the standards include the proper content; or (3) the adoption of nationally-recognized standards endorsed by business and industry.

The Cybersecurity standards were validated through active participation of business and industry representatives on the development team.

PROJECT COORDINATOR

Melissa Scott, Education Programs Professional
 Information and Media Technologies
 Office of Career Readiness, Adult Learning & Education Options
 Nevada Department of Education

INTRODUCTION

The standards in this document are designed to clearly state what the student should know and be able to do upon completion of an advanced high school Cybersecurity program. These standards are designed for a three-credit course sequence that prepares the student for a technical assessment directly aligned to the standards.

These exit-level standards are designed for the student to complete all standards through their completion of a program of study. These standards are intended to guide curriculum objectives for a program of study.

The standards are organized as follows:

Content Standards are general statements that identify major areas of knowledge, understanding, and the skills students are expected to learn in key subject and career areas by the end of the program.

Performance Standards follow each content standard. Performance standards identify the more specific components of each content standard and define the expected abilities of students within each content standard.

Performance Indicators are very specific criteria statements for determining whether a student meets the performance standard. Performance indicators may also be used as learning outcomes, which teachers can identify as they plan their program learning objectives.

The crosswalk and alignment section of the document shows where the performance indicators support the Nevada Academic Content Standards in Science (based on the Next Generation Science Standards) and in English Language Arts and Mathematics (based on the Common Core State Standards). Where correlation with an academic content standard exists, students in the Cybersecurity program perform learning activities that support, either directly or indirectly, achievement of the academic content standards that are listed.

All students are encouraged to participate in the career and technical student organization (CTSO) that relates to the Cybersecurity program. CTSOs are co-curricular national associations that directly enforce learning in the CTE classroom through curriculum resources, competitive events, and leadership development. CTSOs provide students the ability to apply academic and technical knowledge, develop communication and teamwork skills, and cultivate leadership skills to ensure college and career readiness.

The Employability Skills for Career Readiness identify the “soft skills” needed to be successful in all careers, and must be taught as an integrated component of all CTE course sequences. These standards are available in a separate document.

The **Standards Reference Code** is only used to identify or align performance indicators listed in the standards to daily lesson plans, curriculum documents, or national standards.

Cybersecurity: Cybersecurity Standards Reference Code: **CYBR**

Example: CYBR.2.3.4

Standards	Content Standard	Performance Standard	Performance Indicator
Cybersecurity	2	3	4

CONTENT STANDARD 1.0 : SAFETY PROCEDURES AND PROPER USE OF TOOLS**PERFORMANCE STANDARD 1.1 : DEMONSTRATE PROPER SAFETY PROCEDURES**

- 1.1.1 Demonstrate the proper use of safety devices
- 1.1.2 Research the environmental impact of production
- 1.1.3 Research local, state, and federal regulations related to material handling
- 1.1.4 Demonstrate secure disposal of technology materials
- 1.1.5 Describe Material Safety Data Sheets (MSDS)
- 1.1.6 Explain the relationship between organization and safety
- 1.1.7 Demonstrate an organized work environment
- 1.1.8 Demonstrate electrical safety (e.g., grounding, ESD (static), etc.)
- 1.1.9 Apply installation safety (e.g., lifting, overhead movements, etc.)
- 1.1.10 Analyze emergency procedures (building layout, fire escape plan, safety/emergency exits, fail open/close, alert systems)

PERFORMANCE STANDARD 1.2 : IDENTIFY, CATEGORIZE, AND EMPLOY INDUSTRY STANDARD TOOLS

- 1.2.1 Explain common tools used in computer repair
- 1.2.2 Demonstrate the use of common networking and repair tools
- 1.2.3 Select the proper tool for diagnostic and troubleshooting procedures
- 1.2.4 Compare and contrast fire suppression systems in IT environments
- 1.2.5 Describe the purpose of Heating, Ventilation, and Air Conditioning (HVAC) systems for IT systems

CONTENT STANDARD 2.0 : UNDERSTAND TECHNICAL, LEGAL, AND ETHICAL ISSUES**PERFORMANCE STANDARD 2.1 : ANALYZE LEGAL AND ETHICAL ISSUES RELATED TO TECHNOLOGY**

- 2.1.1 Analyze legal issues in technology
- 2.1.2 Evaluate intellectual property laws
- 2.1.3 Explain differences between licensing, copyright, and infringement
- 2.1.4 Explain the differences between restricted content, prohibited or illegal content
- 2.1.5 Examine state, federal, and international regulations related to technology (e.g.; legal holds, disposal methods, data retention, discoverability, data protection, etc.)

PERFORMANCE STANDARD 2.2 : EVALUATE PRIVACY ISSUES RELATED TO TECHNOLOGY

- 2.2.1 Analyze acceptable use policies
- 2.2.2 Explain the difference between technology policies, privacy standards, and best practices
- 2.2.3 Explain data and privacy encryption issues related to using technology
- 2.2.4 Evaluate appropriate consent policies to monitoring various stakeholders
- 2.2.5 Explain appropriate data classification

PERFORMANCE STANDARD 2.3 : DESCRIBE THE IMPORTANCE OF CUSTOMER RELATIONS

- 2.3.1 Communicate with customers to ensure understanding of customer requirements, scope, and concerns
- 2.3.2 Utilize appropriate documentation systems
- 2.3.3 Explain the purpose of business agreements (i.e., memos of understanding, service level agreement, statement of work, master services agreement)

CONTENT STANDARD 3.0 : UNDERSTAND HARDWARE COMPONENTS**PERFORMANCE STANDARD 3.1 : IDENTIFY BASIC HARDWARE COMPONENTS**

- 3.1.1 Categorize system unit components (e.g., power supply connectors, motherboard characteristics, form factors, CPU features, memory module attributes, and expansion business types)
- 3.1.2 Use industry standard vocabulary to identify components

PERFORMANCE STANDARD 3.2 : INSTALL AND CONFIGURE MOTHERBOARD

- 3.2.1 Select and install appropriate system unit components to meet customer specifications
- 3.2.2 Interpret BIOS/UEFI settings for basic hardware components
- 3.2.3 Configure the settings of basic hardware components
- 3.2.4 Troubleshoot basic hardware components and resolve issues

PERFORMANCE STANDARD 3.3 : INSTALL AND CONFIGURE AUDIO AND VIDEO COMPONENTS

- 3.3.1 Categorize audio and video device components, connectors, and cables
- 3.3.2 Install appropriate sound and video cards to match specifications and end-user requirements
- 3.3.3 Configure display and video settings
- 3.3.4 Manage sound card and audio device settings

PERFORMANCE STANDARD 3.4 : INSTALL AND CONFIGURE STORAGE AND OTHER EXTERNAL DEVICES

- 3.4.1 Identify external device components, connectors, and cables
- 3.4.2 Connect external devices using the appropriate connectors and cables
- 3.4.3 Manage device driver updates and roll back drivers
- 3.4.4 Enable or disable devices
- 3.4.5 Install drivers for external devices
- 3.4.6 Prepare devices for safe removal
- 3.4.7 Manipulate system utilities to configure storage and external devices

PERFORMANCE STANDARD 3.5: INSTALL AND MAINTAIN PRINTERS

- 3.5.1 Install SOHO multifunction device / printers and configure appropriate settings
- 3.5.2 Compare and contrast differences between the various print technologies and the associated imaging process
- 3.5.3 Perform appropriate printer maintenance

CONTENT STANDARD 4.0 : UNDERSTAND OPERATING SYSTEMS**PERFORMANCE STANDARD 4.1 : EVALUATE, INSTALL, AND SECURE OPERATING SYSTEMS**

- 4.1.1 Use industry standard vocabulary in relation to operating systems (OS)
- 4.1.2 Compare and contrast Microsoft Windows Operating Systems
- 4.1.3 Install and secure operating systems
- 4.1.4 Install and configure Windows networking

PERFORMANCE STANDARD 4.2 : EMPLOY AND CONFIGURE WINDOWS TOOLS

- 4.2.1 Explain various features and tools of operating systems
- 4.2.2 Apply appropriate command line tools
- 4.2.3 Select appropriate operating system features and tools based on customer requirements
- 4.2.4 Configure Windows Update Settings
- 4.2.5 Configure local users and groups for a Windows networking system
- 4.2.6 Configure User Access Control (UAC)
- 4.2.7 Use Windows Control Panel utilities
- 4.2.8 Perform common preventive maintenance procedures using the appropriate Windows OS tools
- 4.2.9 Troubleshoot common PC security issues using best practices

PERFORMANCE STANDARD 4.3 : TROUBLESHOOT COMMON WINDOWS OPERATING SYSTEMS AND SOFTWARE

- 4.3.1 Explain key terms and acronyms used in diagnostic testing and troubleshooting
- 4.3.2 Identify common symptoms for a given discrepancy
- 4.3.3 Develop a solution for a given discrepancy
- 4.3.4 Document the solution

PERFORMANCE STANDARD 4.4 : ANALYZE OTHER OPERATING SYSTEMS, MOBILE, AND CLOUD TECHNOLOGIES

- 4.4.1 Identify common features and functionality of the Mac OS and Linux operating systems
- 4.4.2 Set up and use client-side virtualization
- 4.4.3 Identify basic cloud concepts
- 4.4.4 Summarize the properties and purpose of services provided by networked hosts
- 4.4.5 Identify basic features of mobile operating systems
- 4.4.6 Install and configure basic mobile device network connectivity and email
- 4.4.7 Summarize methods and data related to mobile device synchronization
- 4.4.8 Compare and contrast methods to secure mobile devices
- 4.4.9 Explain the characteristics of various types of other mobile devices
- 4.4.10 Compare and contrast accessories, features, and ports of mobile and IoT devices
- 4.4.11 Troubleshoot common mobile OS and tablet software/hardware issues

PERFORMANCE STANDARD 4.5 : COMPARE FEATURES OF LAPTOPS AND TABLETS

- 4.5.1 Compare and contrast laptops, tablets, and computer form factors
- 4.5.2 Explain current trends in laptops and tablet applications
- 4.5.3 Compare laptop and tablet operating systems
- 4.5.4 Explain the function of components within the display of a laptop and tablet
- 4.5.5 Compare and contrast accessories, features, and ports of laptops and tablets

CONTENT STANDARD 5.0 : UNDERSTAND INDUSTRY STANDARDS, PRACTICES, AND NETWORK THEORY

PERFORMANCE STANDARD 5.1 : DETERMINE ISO LAYERS

- 5.1.1 Describe the OSI model and relate to hardware in a network
- 5.1.2 Implement the appropriate industry policy and procedures
- 5.1.3 Compare and contrast the ports and protocols (HTTP, NetBIOS, SMTP, TCP, UDP, etc.)
- 5.1.4 Configure and apply appropriate ports and protocols (FTP, SSH, Telnet, DHCP, TFTP, etc.)
- 5.1.5 Utilize appropriate wired connections
- 5.1.6 Utilize appropriate wireless connections

PERFORMANCE STANDARD 5.2 : DEMONSTRATE THE BASICS OF NETWORK THEORY AND CONCEPTS

- 5.2.1 Describe encapsulation/de-encapsulation
- 5.2.2 Explain modulation techniques
- 5.2.3 Apply numbering systems (e.g., binary, octal, hexadecimal)
- 5.2.4 Demonstrate addressing and subnetting techniques
- 5.2.5 Compare broadband/baseband
- 5.2.6 Compare and contrast bit rates vs. baud rates
- 5.2.7 Describe CDMA
- 5.2.8 Explain the difference between CSMA/CD-CSMA/CA
- 5.2.9 Describe wavelength
- 5.2.10 Apply TCP/IP suite (TCP, UDP, ICMP)

PERFORMANCE STANDARD 5.3 : CONFIGURE EQUIPMENT LOCATION USING BEST PRACTICES

- 5.3.1 Compare Main (MDF) and intermediate distribution frame (IDF)
- 5.3.2 Implement a cable management solution
- 5.3.3 Analyze and create a power management plan (i.e., power converters, circuits, UPS {Power redundancy}, inverters, load capacity, etc.)
- 5.3.4 Determine proper airflow for optimal performance
- 5.3.5 Utilize correct rack systems for location and operation
- 5.3.6 Employ consistent labeling methodologies (port, system, circuit, patch panel)
- 5.3.7 Develop a plan to monitor rack security and environmental conditions

CONTENT STANDARD 6.0 : UNDERSTAND NETWORKING**PERFORMANCE STANDARD 6.1 : INSTALL NETWORKS**

- 6.1.1 Categorize Ethernet wired network adapter components, features, and connectors
- 6.1.2 Categorize Ethernet wireless access point components, features, connectors, and cables
- 6.1.3 Describe common network connectivity devices and their roles
- 6.1.4 Analyze properties of basic network protocols
- 6.1.5 Apply appropriate networking utilities to view, test, and troubleshoot basic network configuration, topology, communication, and connectivity problems

PERFORMANCE STANDARD 6.2 : UTILIZE AND IMPLEMENT NETWORK SECURITY PRACTICES AND TECHNIQUES

- 6.2.1 Deploy best practices to secure any device accessing a network
- 6.2.2 Compare and contrast physical security controls
- 6.2.3 Compare and contrast risk related concepts
- 6.2.4 Implement network hardening techniques
- 6.2.5 Configure a basic firewall
- 6.2.6 Explain the purpose of various network access control models
- 6.2.7 Secure SOHO wired and wireless networks
- 6.2.8 Identify common network vulnerabilities, threats, and risks
- 6.2.9 Analyze and implement security settings on figure BIOS/UEFI security settings

PERFORMANCE STANDARD 6.3 : PRACTICE NETWORK TROUBLESHOOTING

- 6.3.1 Implement various networking troubleshooting methodology
- 6.3.2 Analyze and interpret the output of troubleshooting tools
- 6.3.3 Troubleshoot and resolve common wireless issues
- 6.3.4 Troubleshoot and resolve common copper and fiber cable issues
- 6.3.5 Troubleshoot and resolve common network issues
- 6.3.6 Troubleshoot and resolve common security issues
- 6.3.7 Troubleshoot and resolve common WAN issues

PERFORMANCE STANDARD 6.4 : DESCRIBE NETWORK ARCHITECTURE

- 6.4.1 Explain the functions and application of various network devices
- 6.4.2 Compare the use of networking services and applications
- 6.4.3 Install and configure networking services and applications
- 6.4.4 Explain the characteristics and benefits of various WAN technologies
- 6.4.5 Install and terminate various cable types and connectors using appropriate tools
- 6.4.6 Differentiate between network infrastructure implementations
- 6.4.7 Implement and configure the appropriate addressing schema
- 6.4.8 Explain the basics of routing
- 6.4.9 Describe the elements of unified communications technologies

CONTENT STANDARD 7.0 : UNDERSTAND NETWORK OPERATIONS**PERFORMANCE STANDARD 7.1 : USE APPROPRIATE MONITORING TOOLS**

- 7.1.1 Describe use of packet tracing tools and network analyzing tools
- 7.1.2 Demonstrate use of network monitoring tools
- 7.1.3 Demonstrate use of port and vulnerability scanning tools
- 7.1.4 Describe the use of SMTP monitoring software
- 7.1.5 Demonstrate understanding of security information and event management (SIEM) tools
- 7.1.6 Demonstrate use of environmental monitoring tools
- 7.1.7 Operate power monitoring tools
- 7.1.8 Demonstrate use of wireless survey tools

PERFORMANCE STANDARD 7.2 : METRICS AND REPORTS FROM MONITORING AND TRACKING PERFORMANCE TOOLS

- 7.2.1 Analyze SYSLOG data
- 7.2.2 Demonstrate use of log management
- 7.2.3 Apply interface monitoring tools
- 7.2.4 Evaluate system performance metrics against baseline data
- 7.2.5 Evaluate system metrics and logs for resource depletion
- 7.2.6 Evaluate system metrics and logs for network connectivity

PERFORMANCE STANDARD 7.3 : USE APPROPRIATE RESOURCES TO SUPPORT CONFIGURATION MANAGEMENT

- 7.3.1 Prepare archives/backups
- 7.3.2 Build system baseline based on normal operations
- 7.3.3 Describe provisioning and de-provisioning of mobile devices (enterprise, BYOD)
- 7.3.4 Illustrate network access control (NAC)
- 7.3.5 Document a configuration management strategy

PERFORMANCE STANDARD 7.4 : EXPLAIN THE IMPORTANCE OF IMPLEMENTING NETWORK SEGMENTATION

- 7.4.1 Compare and contrast protecting SCADA systems and industrial control systems (ICS)
- 7.4.2 Determine a plan to protect legacy systems
- 7.4.3 Explain how to separate private/public networks
- 7.4.4 Describe theft detection technologies (honeypot/honeynet)
- 7.4.5 Research the need for a testing lab (development ops/DevOps)
- 7.4.6 Determine a plan for load balancing the network
- 7.4.7 Creating a plan for performance optimization (tuning)

PERFORMANCE STANDARD 7.5 : APPLY SYSTEM PATCHES AND UPDATES

- 7.5.1 Install software and hardware patches and updates (OS, critical, non-critical, etc.)
- 7.5.2 Compare and contrast firmware and driver updates
- 7.5.3 Recognize the difference between feature releases/security updates
- 7.5.4 Develop rollout/rollback procedures

PERFORMANCE STANDARD 7.6 : CONFIGURE A SWITCH USING PROPER SETUP AND FEATURES

- 7.6.1 Setup, configure, and secure a VLAN
- 7.6.2 Configure a Spanning Tree Protocol (STP) (IEEE 802.1D) ensuring you do not create any loops
- 7.6.3 Setup an Ethernet Interface via the interface configuration file including demonstrating how to give your network card an IP address (DHCP), set up routing information, configure IP masquerading, and set default routes
- 7.6.4 Setup and configure a default gateway defining where to send packets for IP addresses for which they can determine no specific route
- 7.6.5 Describe and demonstrate several common techniques for transmitting power over Ethernet cabling (PoE and PoE+ 802.3af, 802.3at)
- 7.6.6 Compare and contrast managed vs. unmanaged switches

CONTENT STANDARD 8.0 : UNDERSTAND THE CYBERSECURITY LIFECYCLE

PERFORMANCE STANDARD 8.1 : EXPLAIN THE CYBERSECURITY LIFECYCLE

- 8.1.1 Describe the steps of the cybersecurity lifecycle (e.g., people, process and tools)
- 8.1.2 Write a set of principles, rules, and practices to provide guidance and direction
- 8.1.3 Follow appropriate decision-making model to determine correct response procedures

PERFORMANCE STANDARD 8.2 : DEVELOP AN INCIDENT RESPONSE PLAN

- 8.2.1 Plan, prepare, and develop scope for a Cyber Incident Response Plan
- 8.2.2 Determine correct detection, mitigation, and reporting processes
- 8.2.3 Evaluate assessment and decision-making steps when handling an incident or event
- 8.2.4 Determine correct investigative procedures
- 8.2.5 Gather intelligence from a variety of sources including open source and others
- 8.2.6 Document intelligence gathering efforts including who, what, when, where, why, and how
- 8.2.7 Determine extent of event or incident scope including severity
- 8.2.8 Determine correct containment steps based on the type of incident or event encountered
- 8.2.9 Implement the correct eradication response and processes
- 8.2.10 Determine next steps post investigation (post breach) from legal, HR, news media response

PERFORMANCE STANDARD 8.3 : DESIGN SPECIFIC PLANS FOR THE PROTECTION OF PROPERTY, SYSTEMS, AND DATA

- 8.3.1 Determine the appropriate security control, technique or process based on the property, system or data you are protecting
- 8.3.2 Explain the importance of security controls, techniques, and threat risk assessments
- 8.3.3 Select the appropriate solution to eliminate vulnerabilities and establish a security baseline
- 8.3.4 Develop plans to protect a variety of property, systems, or data
- 8.3.5 Implement the appropriate controls to ensure security of property, systems, or data
- 8.3.6 Compare and contrast alternative methods to mitigate security risks for data in transit and data at rest

PERFORMANCE STANDARD 8.4 : EXPLAIN INCIDENT AND EVENT HANDLING FUNCTIONS IN A SYSTEM

- 8.4.1 Describe the digital chain of custody process for tracking data and equipment (legal evidence)
- 8.4.2 Describe all steps to capture and maintain evidence
- 8.4.3 Follow chain of custody procedures
- 8.4.4 Maintain detailed records (e.g., chain of custody forms, evidence collection forms, etc.)
- 8.4.5 Track digital evidence (e.g., how it has been gathered, tracked, and protected)
- 8.4.6 Describe a chain of custody
- 8.4.7 Develop a plan for data transport, encryption to avoid alteration of data and legal holds
- 8.4.8 Develop a plan for recovery, disposal of evidence, and follow up
- 8.4.9 Write a forensics summary report

CONTENT STANDARD 9.0 : UNDERSTAND COMPUTER FORENSICS CONCEPTS**PERFORMANCE STANDARD 9.1 : DETERMINE INVESTIGATIVE OBJECTIVES**

- 9.1.1 Summarize basic forensic concepts and practices including eDiscovery, documentation, chain of custody, and data transport
- 9.1.2 Determine a first responder's logical approach during an investigation with objective, evidence-based research
- 9.1.3 Review the First Responder steps and processes for proper documentation
- 9.1.4 Explain what eDiscovery is including the contextual process for electronic evidence collection (Electronically Stored Information ESI)
- 9.1.5 Observe and discuss legal restrictions, stipulations, regulatory compliance, and confidentiality when gathering evidence
- 9.1.6 Summarize Chain of Custody processes during investigations

PERFORMANCE STANDARD 9.2 : EXAMINE EXPLOITS, THREATS, ATTACKS, AND TARGETS

- 9.2.1 Explain the proper use of penetration testing versus vulnerability scanning
- 9.2.2 Explain the many types of vulnerabilities, exploits, and cyber threats a First Responder encounters
- 9.2.3 Discover the common types of cyber threat actors including Cybercriminals, Attention-Seekers, Hacktivists, Jihadi Hackers, and Nation States
- 9.2.4 Explain and summarize the common cybersecurity attacks including the preferred tactics, techniques, and procedures (TTPS) of threat actors
- 9.2.5 Examine and summarize the targets of cyber threat actors including governments, military agencies, non-profits, and businesses across sectors including retail, legal, energy, healthcare, technology, entertainment, and telecommunications
- 9.2.6 Review and examine geopolitical flashpoints (e.g., U.S.-China Relations, Iranian Nuclear Accord, Economic Sanctions on Russia, Syrian Conflict, ISIS-related Activity, North Korean Policy, State-Sponsored Cyber Activity, Cybersecurity Regulations)

PERFORMANCE STANDARD 9.3 : eDISCOVERY AND FORENSIC RESPONSE TOOLS AND METHODS

- 9.3.1 Describe and demonstrate various methods and tools for threat detection and eDiscovery
- 9.3.2 Describe and demonstrate vulnerability management methods, practices, and scanning tools
- 9.3.3 Describe and demonstrate various practices, methods, and tools for penetration testing
- 9.3.4 Identify encryption methods and demonstrate tools to decipher encrypted data
- 9.3.5 Review basic cryptography concepts, methods, and its relationship to forensics
- 9.3.6 Identify Web application exploits, vulnerabilities
- 9.3.7 Describe and demonstrate Web Application Security and Scanning methods and tools
- 9.3.8 Identify methods or tools to eliminate cloud exploits and vulnerabilities
- 9.3.9 Describe and demonstrate a working knowledge of phishing attacks and mitigation steps

PERFORMANCE STANDARD 9.4 : PERFORM FORENSIC ANALYSIS AND REVERSE ENGINEERING MALWARE

- 9.4.1 Explain what malware is including its history
- 9.4.2 Review and define the most common malware terminologies
- 9.4.3 Describe the ways and methods malware is spread
- 9.4.4 Review the types of malware specifically examining viruses, worms, trojan horses, rootkits ransomware, keyloggers, and grayware attack
- 9.4.5 Choose one malware scenario and select the appropriate type of mitigation and deterrent techniques
- 9.4.6 Use appropriate tools and techniques to eliminate malware from spreading

CONTENT STANDARD 10.0 : UNDERSTAND EMERGING TECHNOLOGIES**PERFORMANCE STANDARD 10.1 : EXAMINE EMERGING TECHNOLOGIES AND THEIR IMPACT ON SOCIETY**

- 10.1.1 Explain Artificial Intelligence (AI), potential applications, concerns, and opportunities in relation to security issues
- 10.1.2 Describe machine learning and potential applications, concerns, and opportunities
- 10.1.3 Explain the role of ethics as it relates to security and emerging technologies

PERFORMANCE STANDARD 10.2 : EXPLAIN WORKFORCE NEEDS RELATED TO NEW AND EMERGING TECHNOLOGIES

- 10.2.1 Describe job skills needed for potential careers in new and emerging technologies
- 10.2.2 Explore potential uses for and industries that may use emerging technologies

CROSSWALKS AND ALIGNMENTS**CROSSWALKS (ACADEMIC STANDARDS)**

The crosswalk of the Cybersecurity Standards shows links to the Nevada Academic Content Standards in Science (based on the Next Generation Science Standards – Disciplinary Core Ideas Arrangement) and in English Language Arts and Mathematics (based on the Common Core State Standards). The crosswalk identifies the performance indicators in which the learning objectives in the Cybersecurity program support academic learning. The performance indicators are grouped according to their content standard and are crosswalked to the Nevada Academic Content Standards in Science, English Language Arts, and Mathematics.

ALIGNMENTS (MATHEMATICAL PRACTICES)

In addition to correlation with the Nevada Academic Content Standards for Mathematics, many performance indicators support the Mathematical Practices. The following table illustrates the alignment of the Cybersecurity Standards Performance Indicators and the Mathematical Practices. This alignment identifies the performance indicators in which the learning objectives in the Cybersecurity program support academic learning.

ALIGNMENTS (SCIENCE AND ENGINEERING PRACTICES)

In addition to correlation with the Nevada Academic Content Standards for Science, many performance indicators support the Science and Engineering Practices. The following table illustrates the alignment of the Cybersecurity Standards Performance Indicators and the Science and Engineering Practices. This alignment identifies the performance indicators in which the learning objectives in the Cybersecurity program support academic learning.

CROSSWALKS (COMMON CAREER TECHNICAL CORE)

The crosswalk of the Cybersecurity Standards shows links to the Common Career Technical Core. The crosswalk identifies the performance indicators in which the learning objectives in the Cybersecurity program support the Common Career Technical Core. The Common Career Technical Core defines what students should know and be able to do after completing instruction in a program of study. The Cybersecurity Standards are crosswalked to the Information Technology Career Cluster™ and the Network Systems Career Pathway.

This Page was Intentionally Left Blank.

**CROSSWALK OF CYBERSECURITY STANDARDS
AND THE NEVADA ACADEMIC CONTENT STANDARDS**

CONTENT STANDARD 1.0: SAFETY PROCEDURES AND PROPER USE OF TOOLS

Performance Indicators	Nevada Academic Content Standards
1.1.2	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p> <p>WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
1.1.3	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p> <p>WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p> <p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>
1.1.4	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p> <p>WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p> <p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>
1.1.6	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.1 Write arguments focused on discipline-specific content.</p>

Performance Indicators	Nevada Academic Content Standards
1.1.10	<p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>
1.2.5	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>

CONTENT STANDARD 2.0: UNDERSTAND TECHNICAL, LEGAL, AND ETHICAL ISSUES

Performance Indicators	Nevada Academic Content Standards
2.1.1	<p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p>RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>
2.1.2	<p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RI.11-12.8 Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., The Federalist, presidential addresses).</p> <p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>
2.2.1	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p> <p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>

Performance Indicators	Nevada Academic Content Standards
2.2.4	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p> <p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p>English Language Arts: Reading Standards for Informational Text RI.11-12.7 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.</p>
2.3.1	<p>English Language Arts: Speaking and Listening Standards SL.11-12.1c Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.</p> <p>SL.11-12.2 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.</p> <p>SL.11-12.3 Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.</p> <p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2d Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
2.3.2	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>

CONTENT STANDARD 3.0: UNDERSTAND HARDWARE COMPONENTS

Performance Indicators	Nevada Academic Content Standards
3.2.2	<p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p>
3.5.2	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p> <p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>

CONTENT STANDARD 4.0: UNDERSTAND OPERATING SYSTEMS

Performance Indicators	Nevada Academic Content Standards
4.1.1	<p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p>
4.3.1	<p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p>
4.3.4	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.</p>
4.4.4	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
4.4.7	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
4.4.10	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p>
4.5.2	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>

Performance Indicators	Nevada Academic Content Standards
4.5.3	<p data-bbox="423 275 1382 302">English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</p> <p data-bbox="423 306 1403 365">WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p data-bbox="423 380 1386 407">English Language Arts: Reading Standards for Literacy in Science and Technical Subjects</p> <p data-bbox="423 411 1438 506">RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p data-bbox="423 520 1386 611">RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>

CONTENT STANDARD 5.0: UNDERSTAND INDUSTRY STANDARDS, PRACTICES, AND NETWORK THEORY

Performance Indicators	Nevada Academic Content Standards
5.1.1	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p>
5.2.2	<p>English Language Arts: Speaking and Listening Standards SL.11-12.2 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. SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
5.2.7	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p>
5.2.8	<p>English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>

CONTENT STANDARD 6.0: UNDERSTAND NETWORKING

Performance Indicators	Nevada Academic Content Standards
6.1.3	English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
6.1.4	English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
6.2.1	English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
6.2.2	English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
6.4.1	English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
6.4.4	English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Performance Indicators	Nevada Academic Content Standards
6.4.8	<p>English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
6.4.9	<p>English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p> <p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p>

CONTENT STANDARD 7.0: UNDERSTAND NETWORK OPERATIONS

Performance Indicators	Nevada Academic Content Standards
7.2.1	<p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>
7.2.2	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p>
7.4.1	<p>English Language Arts: Reading Standards for Literacy in Science and Technical Subjects RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>
7.4.3	<p>English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
7.4.7	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
7.5.2	<p>English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
7.5.4	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST.11-12.2a Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
7.6.5	<p>English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>

Performance Indicators	Nevada Academic Content Standards
7.6.6	English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

CONTENT STANDARD 8.0: UNDERSTAND THE CYBERSECURITY LIFECYCLE

Performance Indicators	Nevada Academic Content Standards
8.1.2	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>
8.2.6	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p>
8.3.2	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>
8.4.1	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>
8.4.2	<p>English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
8.4.4	<p>English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. SL.11-12.6 Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate. (See grades 11–12 Language standards 1 and 3 on page 54 for specific expectations.) English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2d Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>

Performance Indicators	Nevada Academic Content Standards
8.4.9	English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CONTENT STANDARD 9.0: UNDERSTAND COMPUTER FORENSICS CONCEPTS

Performance Indicators	Nevada Academic Content Standards
9.1.1	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p>
9.1.6	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p> <p>English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
9.2.1	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
9.3.1	<p>English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
9.3.2	<p>English Language Arts: Speaking and Listening Standards SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>
9.4.1	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>

CONTENT STANDARD 10.0: UNDERSTAND EMERGING TECHNOLOGIES

Performance Indicators	Nevada Academic Content Standards
10.1.1	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p> <p>WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
10.1.2	<p>English Language Arts: Writing Standards for Literacy in Science and Technical Subjects</p> <p>WHST.11-12.7 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; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p> <p>WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>
10.1.3	<p>English Language Arts: Speaking and Listening Standards</p> <p>SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p>

**ALIGNMENT OF CYBERSECURITY STANDARDS
AND THE MATHEMATICAL PRACTICES**

Mathematical Practices	Cybersecurity Performance Indicators
1. Make sense of problems and persevere in solving them.	3.2.4; 3.3.2, 3.3.3; 3.5.1 5.2.3
2. Reason abstractly and quantitatively.	5.3.4 8.2.8, 8.2.9; 8.4.7 9.3.9; 9.4.6
3. Construct viable arguments and critique the reasoning of others.	6.4.4 7.6.6
4. Model with mathematics.	5.2.3; 5.3.4 9.3.5
5. Use appropriate tools strategically.	1.2.3 5.1.3; 5.3.5 6.2.1, 6.2.6; 6.4.3 7.1.5; 7.6.1 - 7.6.4 9.3.3, 9.3.4, 9.3.7, 9.3.8
6. Attend to precision.	6.4.3 8.1.4; 8.4.4
7. Look for and make use of structure.	2.2.5 3.2.3 5.1.4 - 5.1.6; 5.3.6 6.1.1, 6.1.2; 6.4.7 8.1.3; 8.4.3 9.1.2, 9.1.3
8. Look for and express regularity in repeated reasoning.	3.4.7 4.4.6 8.4.3

**ALIGNMENT OF CYBERSECURITY STANDARDS
AND THE SCIENCE AND ENGINEERING PRACTICES**

Science and Engineering Practices	Cybersecurity Performance Indicators
1. Asking questions (for science) and defining problems (for engineering).	3.4.7 4.2.8 7.4.6, 7.4.7
2. Developing and using models.	7.3.2; 7.4.2; 7.5.2 9.3.5
3. Planning and carrying out investigations.	4.2.9 5.3.3, 5.3.4 8.2.4 - 8.2.10 9.3.8 - 9.3.10; 9.4.5
4. Analyzing and interpreting data.	1.1.5 2.2.3, 2.2.5 7.2.4 - 7.2.6
5. Using mathematics and computational thinking.	8.3.8; 8.4.7
6. Constructing explanations (for science) and designing solutions (for engineering).	1.18 4.3.2, 4.3.3; 4.4.11 6.1.5; 6.3.1 - 6.3.7 8.3.3, 8.3.4 9.4.5, 9.4.6
7. Engaging in argument from evidence.	8.3.6 9.1.5; 9.2.6
8. Obtaining, evaluating, and communicating information.	2.3.2 8.1.2; 8.2.1 - 8.2.3; 8.4.4, 8.4.5

**CROSSWALKS OF CYBERSECURITY STANDARDS
AND THE COMMON CAREER TECHNICAL CORE**

Information Technology Career Cluster™ (IT)	Performance Indicators
1. Demonstrate effective professional communication skills and practices that enable positive customer relationships.	2.3.1; 3.1.2; 4.1.1
2. Use product or service design processes and guidelines to produce a quality information technology (IT) product or service.	1.2.2, 1.2.3; 3.2.3; 8.2.1 8.3.1; 8.4.7 - 8.4.8
3. Demonstrate the use of cross-functional teams in achieving IT project goals.	8.4.3
4. Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors.	2.1.1 - 2.1.5
5. Explain the implications of IT on business development.	2.1.5; 2.2.3; 2.3.3
6. Describe trends in emerging and evolving computer technologies and their influence on IT practices.	10.1.1 - 10.1.3
7. Perform standard computer backup and restore procedures to protect IT information.	1.2.3; 4.4.8
8. Recognize and analyze potential IT security threats to develop and maintain security requirements.	6.2.1, 6.2.10; 8.4.1 - 8.4.9
9. Describe quality assurance practices and methods employed in producing and providing quality IT products and services.	1.1.6, 1.1.9; 4.2.3; 4.3.2 4.3.3
10. Describe the use of computer forensics to prevent and solve information technology crimes and security breaches.	8.1.1 - 8.1.3; 8.2.1 - 8.2.10 8.3.1 - 8.3.6; 9.1.6 9.2.1 - 9.2.6 9.3.1 - 9.3.9; 9.4.1
11. Demonstrate knowledge of the hardware components associated with information systems.	3.2.1 - 3.2.3; 3.3.2, 3.3.3 3.4.1 - 3.4.7; 3.5.1 - 3.5.3 4.5.1 - 4.5.5; 5.1.4 - 5.1.6 5.3.1 - 5.3.7; 6.1.5
12. Compare key functions and applications of software and determine maintenance strategies for computer systems.	4.1.3, 4.1.4; 4.2.4, 4.2.8 4.4.6; 5.2.10

Network Systems Career Pathway (IT-NET)	Performance Indicators
1. Analyze customer or organizational network system needs and requirements.	5.1.2; 5.3.6; 6.4.2
2. Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power, security).	6.1.1 - 6.1.5; 7.1.1 7.4.1 - 7.4.7
3. Design a network system using technologies, tools and standards.	6.4.7; 7.6.1 - 7.6.6
4. Perform network system installation and configuration.	6.2.6; 6.4.3, 6.4.5 7.5.1 - 7.5.4
5. Perform network administration, monitoring and support to maintain a network system.	5.3.7; 6.3.1 - 6.3.7; 7.1.8 7.2.4 - 7.2.6