COLTON REDLANDS YUCAIPA
REGIONAL OCCUPATIONAL PROGRAM

2021-2022

Cybersecurity 2

COURSE OUTLINE - UC

DESCRIPTION:

This course builds on the skills students developed in Cybersecurity I. In today's Internet-dependent business environment, secure communications is critical to networks of all types including mobile devices. In this course, you will learn how to analyze network risks and provide the appropriate countermeasures to reduce exposure from network threats. This course provides the hands-on skills necessary to secure computer information at both the system and network level. Activities in this course include work-based learning that connects students to industry and the local community.

INFORMATION:

PRE-REQUISITE:	Cybersecurity I or equivalent (PC Repair, Networking or Programming), Algebra I
ABILITIES REQUIRED:	Configure TCP/IP Networks and Beginning Programming
LENGTH:	One Year
SECTOR:	Information and Communication Technologies
PATHWAY:	Information Support and Services
ARTICULATED:	Yes
UC A-G APPROVAL:	Yes: College-Preparatory Elective (G) – Mathematics – Computer Science Requirement

O*NET SOC CODES:

15-1051.00	Computer User Support Services
15-1122.00	Information Security Analysts
13-1199.02	Security Management Specialists

Orientation

A. Introduce the course and facilities.
B. Discuss the syllabus and major objectives.
C. Explain applicable classroom management procedures, the ROP Student Rules of Conduct, and any operational guidelines.
D. Review instructor/student expectations.
E. Explain enrollment and attendance requirements and procedures.
F. Review grading and student evaluation procedures.
G. Discuss the community classroom aspect of the program if applicable.
H. Discuss the "next steps" related to additional education, training, and employment.
I. Review classroom safety, emergency and disaster procedures.

1. Communication Skills

A. Demonstrate positive verbal communication skills using appropriate vocabulary, demeanor, and vocal tone in the classroom and/or worksite.
B. Read and interpret written information and directions.
C. Practice various forms of written communication appropriate to the occupation.
D. Practice positive body language skills.
E. Practice professional verbal skills for resolving a conflict.
F. Demonstrate active listening skills including techniques for checking for understanding, and for obtaining clarification of directions.

2. Interpersonal Skills

A. Demonstrate positive teamwork skills by contributing to a group effort.
B. Practice the importance of diversity awareness and sensitivity in the workplace.
C. Define sexual harassment in the workplace and identify the employee's role and responsibility.
D. Practice participation skills.
E. Identify different personality types and strategies for working effectively with each type.
F. Practice business and social etiquette skills appropriate to the occupation.
G. Discuss the role of business and personal ethics in the decision-making process.
H. Evaluate various job-related scenarios and justify decisions based on ethics.
I. Demonstrate flexibility and adaptability in working with others.
J. Demonstrate the use of time management skills.

3. Employability Skills

A. Demonstrate appropriate attendance and punctuality practices for the classroom and worksite if applicable.

B. Prepare a resume, cover letter, and job application forms.
C. Demonstrate interviewing techniques using appropriate tone and body language.
D. Demonstrate appropriate dress and grooming standards in seeking employment and for the workplace.
E. Identify strategies for employment retention.
F. Analyze the impact of social networking on employability.
G. Identify the need for continuing education, professional development, and professional growth in chosen field.
H. Identify appropriate procedures for leaving a job.
I. Identify sources of job information, including electronic sources.
J. Review company policies and current trends in employee compatibility screening, drug screening, and background checks.

4. Leadership

A. Define leadership and identify the responsibilities, competencies, and behaviors of successful leaders.
B. Work with peers to promote divergent and creative perspectives.
C. Demonstrate how to organize and structure work, individually and in teams, for effective performance and the attainment of goals.
D. Explain multiple approaches to conflict resolution and their appropriateness for a variety of situations in the workplace.
E. Employ ethical behaviors and actions that positively influence others.
F. Use a variety of means to positively impact the direction and actions of a team or organization.
G. Analyze the short-term and long-term effects a leader's actions and attitudes can have on productivity, morale, and organizational culture.

5. Personal and Occupational Safety

A. Demonstrate procedures to be followed in the case of emergencies.
B. Discuss ways to report a potential safety hazard to a supervisor.
C. Identify and discuss cyber ethics, cyber safety, and cyber security.
D. Apply personal safety practices to and from the job.
E. Describe the procedure for reporting a work-related hazard or injury.
F. Recognize the effects of substance abuse in the workplace.

6. Introduction to Cybersecurity

A. Identify common system vulnerabilities and the options to mitigate the potential risks at the consumer level.
B. Identify industry certification exams.
C. Identify options for continuing education and training.
D. Identify career roles and related industry certifications including Network+, Security+, CEH, CHFI C.
E. Identify college pathways for completing related degree programs such as Information Assurance.
F. Determine how Internet surfing habits and opening unsolicited email can lead to security compromise.

G. Distinguish why Windows products seem to be more vulnerable than Apple, Unix, Linux, or Android operating systems.
H. Discuss the ethics of using a neighbor's unsecured Wi-Fi, or scanning networks at a public hotspot or library.
I. Identify general problems with default settings of a new wireless router.

7. Introductory Programming and Scripting

A. Demonstrate how to use the command-line interface including UNC paths and proper syntax.
B. Use batch programming to automate system administrative tasks.
C. Use VB.Net to create custom programs and utilities for system administration.
D. Demonstrate how to apply Windows PowerShell syntax to invoke Cmdlets and scripts.
E. Apply variables, constants, and arrays to scripts and programs to manage a database.
F. Control program flow with decision structures (e.g., If.Then.Else).
G. Describe arguments, parameters and how to pass data to a procedure (e.g., values, variables, functions).
H. Control program flow with looping structures (e.g., For.Next, Do.Until,While; Timers and Counters).
I. Apply Basic Boolean Logic to scripts and program (e.g., And, Or, Not, Xor).
J. Incorporate *Random* into scripts or programs for statistical analysis.

8. Cyber Defense

A. Demonstrate how to harden system and network defense to reduce risks.
B. Demonstrate how to audit a Windows system for vulnerabilities.
C. Demonstrate appropriate countermeasures in real-time during a system compromise.
D. Demonstrate options to quickly recover from a system attack or virus damage.
E. Complete a system audit including event logs, ports, processes, services, variables, paths, and file properties.
F. Harden operating systems and settings, and install needed service packs and updates.
G. Upgrade, replace, and configure browsers to prevent phishing attacks while providing privacy.
H. Identify common areas targeted by virus attacks and their characteristic signs of intrusion (e.g., registry, services, dll's).
I. Administer the system firewall access control and identify common port services used (e.g., email, FTP, etc.).
J. Configure a router for typical defense measures and wireless security settings (e.g., DHCP, WPK, disable ICMP, etc.).
K. Demonstrate how to render a network invisible to an intruder using custom subnets (i.e. network enumeration).
L. Demonstrate the different ways to use the last known good control set to quickly recover from an attack event.
M. Demonstrate how a multi-boot system can be used to recover and launch a countermeasure to a recent attack.

9. Cyber Threats

A. Distinguish and Identify common network attacks and system security threats.
B. Demonstrate how to determine an attack event has occurred on a Windows network.
C. Demonstrate how to reverse track and identify an attack event's point of origin.

D. Distinguish the characteristics of a Denial of Service attack (e.g., methods used in Smurf, Ping of Death, SYN flood).
E. Identify the key differences between Viruses, Worms, Trojans, Rootkits, and Bots.
F. Define Phishing, Port-Redirection, Man-in-the-Middle, Brute-Force, and Rogue Access Points.
G. Describe the purpose of Packet sniffers and Port scanners.
H. Identify vulnerable software interfaces such as ActiveX and Java controls, FTP, and Telnet.
I. Demonstrate how to check for signs of an attack using Event Viewer, router, and server logs.

10. Networking

A. Install, configure, and test a static TCP/IP network including DNS for Internet access.
B. Calculate and implement precise custom subnet values for Class B and C networks (subnetting).
C. Install and manage a Windows-based server on a Class C network (www, FTP).
D. Identify common TCP/IP commands and utilities, and their purpose (e.g., tracert, arp, netstat, route, ipconfig, etc.).
E. Extract the network ID from overlaying (multiplying) the Subnet and IP address (Logical Anding).
F. Enumerate IP addresses using both binary and hexadecimal notations to prove network settings.
G. Identify standard IPV4 and IPV 6 network classes, subnets, address ranges, and typical application.
H. Create a matrix or table of subnet schemes including the number of valid hosts and networks.
I. Explain the various roles and purposes of common servers (e.g., DNS, DHCP, Domain Controller, etc.).

11. Cyber Laws, Ethics, and Compliance

A. Identify the laws and policies directly related to cybersecurity and the handling of sensitive private information.
B. Identify the agencies responsible for enforcement of local and international cybersecurity.
C. Describe HIPAA - Health Insurance Portability and Accountability Act of 1996 (i.e. Privacy and Breach Notification Rules).
D. Describe how the Computer Security Act of 1987 requires federal agencies to identify servers with sensitive data and provide staff training.
E. Describe how the US PATRIOT Act of 2001 enhanced surveillance methods and allows victims of computer hacking to seek help from authorities.
F. Describe the Americans with Disabilities Act of 1990, Section 508 and how it provisions off-site learning to be available for all.

12. System Administration

A. Create a multi-boot system of Windows and Linux operating systems.
B. Manage user and group accounts to implement best security practices.
C. Use drive imaging to backup and recover computer systems on the network.
D. Implement Windows 8 Advanced Boot Options Menu (F10) to recover a damaged system.
E. Determine pre-installation tasks for system setup including hardware requirements, partition layout, network access, and licensing.
F. Identify the five (5) stages of the boot process and the files loaded during each sequence.

G. Plan and assign NTFS folder and file permissions including encryption and password protections.
H. Create a mapped network drive for cross-platform access.
I. Create new user and group accounts and configure resource access rights and permissions.
J. Install and configure IIS for a default FTP server and demonstrate command line and browser access of these sites.
K. Configure proxy settings for virtual port access through a router or similar firewall.
L. Perform an unattended installation of an operating system by creating a scripted answer file.
M. Utilize Sysprep to deploy an image of Microsoft OS for departmental use.
N. Utilize imaging software to deploy and backup an operating system over a network.
O. Use PowerShell to check hotfixes, start/stop processes and services (e.g., get-, start-, stop-).
P. Distinguish Windows 8 Boot Options including *Reset PC, Refresh Windows, and System Image Recovery.*

13. Introduction to Digital Forensics

A. Recover lost data by restoring the boot sector or file table of a corrupted hard drive.
B. Reverse track the file properties of malicious code including event time and source.
C. Demonstrate how to access the Pre-installation Environment of Windows. (boot disk or boot.ini entry)
D. Demonstrate and identify disk utility commands used to recover data (e.g., FDISK, FixMBR, etc.).
E. Rebuild File Allocation Tables by using boot sector readers and utilities such as FTK or NTFS readers, etc.
F. Explain the geometry of hard drive disks using CHS calculations (cylinders, heads, sectors) to determine storage capacity.
G. Use Debug to clean wipe a hard drive by resetting all binary bits to 0 on Interrupt 13.
H. Utilize Sysprep to deploy an image of Microsoft OS for departmental use.
I. Utilize Acronis to deploy and backup Microsoft OS over a network.

Key Assignments

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
1. Students will participate in mock interviews that represent current industry practices (e.g., skills demonstrations, resumes, applications, portfolios, personal websites, etc.).	1A, B, D 3B, C, D, I, J	2 3 10	2 3		LS 11-12.6 SLS 11-12.2
2. Students will research a possible personal career pathway and develop an electronic presentation, covering required certifications. College majors, costs, time lines, job titles, job requirements, and plans for life-long learning due to inherent technology changes within the field.*	1B, C 3G, I 6B-E	2 3 4 12	2 3 4		LS 11-12.6 WS 11-12.6
3. Students will debate the following topic: “right to privacy vs. national security; convenience vs. safety.” They must respond thoughtfully to diverse perspectives, synthesize comments, claims, and evidence made on all sides of the issue, resolve contradictions when possible, and determine what additional information or research is required to deepen the investigation.*	1A, E, F 2D, F, I 4D 5C 11A-E	1 2 5 9 10 11	2 4 5 7 8 10	A 3.0 A 5.0	LS 11-12.6 RS 11-12.1 SLS 11-12.1 SLS 11-12.1d
4. Students will research and identify the security responsibilities of organizations that collect and store personal information, answering the following questions: At what point should they be required to notify people when they have experienced a security breach? How much information should they be required to provide consumers to protect their identification and assets?*	1B, C 5C 11A-F	1 2 5 8 10 11	2 4 5 7 8 10	A 1.0 A 3.0 A 5.0	RSIT 11-12.7 WS 11-12.7
5. Password vulnerability: Students will create a password using the Echo command and trace it to its last memory address using Debug.*	1A, B, C, F 2A, D, G, H 3J 5C	1 5 7 8	4 8	A 4.0 A 5.0	LS 11-12.6 WS 11-12.6 RSIT 11-12.7 SLS 11-12.2

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
	6A, F, G 7A 8G, H 9C 11A 13B				N-Q 1
6. Router web access: Students will check DHCP client list on a router to identify computers and mobile devices in the room. Aligns to NSA Knowledge Unit 1.6.*	1A, B, F 2A, D, G, H 3J 5C 6A, H, I 7A 8B, J 9C 10I 11A, E	1 5 7 8	2 4	A 2.0 A 3.0	LS 11-12.6 RSIT 11-12.7 SLS 11-12.1, 11-12.2
7. Students will create a batch program that resolves IP addresses to NetBIOS names and MAC addresses remotely.*	1B, C, F 2D, G, H, J 3A, J 5C 7A, B, G, H 8B, C 9C 10D 11A, E	1 4 7 8	4 10	A 2.0 A 3.0 A 4.0	LS 11-12.6 WS 11-12.4, 11-12.6 RSIT 11-12.7 SLS 11-12.2 N-Q 1
8. Students will create a script to purge temporary caches automatically when system shuts down.*	1B, C, F	1 4	4 10	A 2.0 A 4.0	LS 11-12.6 WS 11-12.6

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
	2D, J 3A 5C 7A, B, D, E 8A, B, D, H 9A, E 11A	7 8			RSIT 11-12.7 SLS 11-12.2
9. Students will create a file scanner capable of parsing data (e.g., virus scanner).*	1A, B, C, F 2D, G, J, H 3A, J 5C 7A, B, E-I 8C, G, H 9B, C 11A, E 13B, G	1 4 5 7 8	4 8 10	A 2.0 A 4.0 A 6.0	LS 11-12.6 WS 11-12.6, 11-12.7 RSIT 11-12.7 SLS 11-12.2 N-Q 3
10. Students will create an application capable of sending/receiving remote messages and files.*	1A, B, C, F 2D, G, J, H 3A, J 5C 6A, F 7A-C, E-I 9A 10D 11A, E	1 4 7 8	2 4 8	A 2.0 A 3.0 A 4.0	LS 11-12.6 WS 11-12.6 RSIT 11-12.7 SLS 11-12.2 N-Q 1
11. Students will use VB.Net to create a network scanner to graphically display computers that are on or off.*	1B, C, F	1 2	2 4	A 2.0 A 3.0	LS 11-12.6 WS 11-12.6, 11-12.7

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
	2D, G, H, J 3A, J 5C 6A 7A-C, E-I 8B, C 9A, D 10A, D 11A, E	4 5 7 8	10	A 4.0 A 8.0	RSIT 11-12.7 SLS 11-12.2 A-CED 2 F-IF 2, 4
12. Students will develop a Decipher Tool program written in Visual Basic and use Binary Algebra to encode the entire alphabet into hexadecimal (base16). Students will then use the program to demonstrate how the "Substitution" cipher method works and find the unknown encryption key's binary value. Students will proof their work by testing the Boolean Logic of their program to decipher each other's messages. Students will report out on the pros and cons of using this type of software security.*	1A-C, F 2A, D, J 5C 7C, E-J	1 2 4 5 10	2 4 5 10	A 3.0 A 4.0 A 8.0	RSIT 11-12.7 SLS 11-12.1 WS 11-12.6 A-CED 2 F-IF 2,4
13. Students will create a PowerShell script (ps1 file) to automatically create a system restore point. Aligns to NSA Knowledge Unit 1.2.*	1B, C, F 2D 5C 7A, B, D 8D, H, L 12D, F, 0	1 4	4	A 2.0 A 4.0	LS 11-12.6 WS 11-12.6 RSIT 11-12.7
14. In advance of a mock cyber-attack, defending students (Blue Team) will configure common system defenses to repel the attack while attacking students (Red Team) will launch a multi-stage attack while maintaining their own defense during the counterattack. Each student team will produce their audit log of the attack for analysis and documentation of potential	1A-C, E, F 2A, B, D-J 3A, J 5C	1 2 4 5 7	2 4 5 8 9	A 2.0 A 4.0 A 5.0 A 6.0 A 8.0	LS 11-12.6 WS 11-12.6, 11-12.7 RSIT 11-12.7 SLS 11-12.1,11-12.1d, 11-12.2

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
vulnerabilities.*	6A, G 7A, B 8A-I, K, M 9A-I 10A, C, D, G, I 11A, E 12B, H-K, O	8 9 10 11	10		N-Q 1
15. Students will scan TCP and UDP ports for real-time system intrusion and identify the intruder's MAC address (e.g., netstat, arp, NBTstat).*	1B, C, F 2D, G, H, J 5C 6A, G 7A, B, H 8B, C, G 9A-D, G 10A, D, G, I	1 4 5 7 8	2 4 5 8	A 2.0 A 4.0 A 6.0	LS 11-12.6 WS 11-12.4 RSIT 11-12.7 SLS 11-12.2 N-Q 1
16. Students will use SysPrep utility to prepare their computer for image deployment. Each student will then reload his/her drive image to restore the computer to its original state. Aligns to NSA Knowledge Unit 1.3.*	1B, F 2D, G, H 3A 8D 11A 12C, E, M, N	1 4 5 7 8	4 5	A 2.0 A 4.0	LS 11-12.6 RSIT 11-12.7 SLS 11-12.2
17. 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.).*	1A-C, E, F 2A, D, F-H, J 3A, J 5C 6A, H, I	1 2 4 5 7 8	2 4 5 8	A 2.0 A 3.0 A 6.0	LS 11-12.6 WS 11-12.4 RSIT 11-12.7 SLS 11-12.1d, 11-12.2 N-Q 1, 2

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
	7A, B, E,F, H, I 8C, J, K 9A, C 10A, B, D-I 11A, E 12H, J, O				
18. 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.*	1A-C, E, F 2A, D, F-H, J 3A, J 5C 6A, F, H 7A, B 8B, C 9C, D, F-H 10A, C, D, G, I 11A, E 12B, H-K	1 2 4 5 7 8	2 4 5 8	A 2.0 A 3.0 A 4.0 A 6.0	LS 11-12.6 WS 11-12.4 RSIT 11-12.7 SLS 11-12.1d, 11-12.2 N-Q 1, 3
19. Students will develop an IP address/subnet calculator written in Visual Basic that can determine the number of hosts per subnet, and the number of subnets per network. Students will use the algebraic method "Modular Exponentiation," including Euler's "Repeated Squares Algorithm" to create a function that can convert decimal (base10) values to binary (base2) notation. Students will proof their work by deriving the mod equivalent values of subnet bits (powers) and charting the results in a table matrix for later use.*	1B 7A-C, E-J 10B, E-H	1 4 5 10	4 5 10	A 1.0 A 3.0 A 4.0 A 8.0	RSIT 11-12.7 A-CED 2 F-IF 2, 4 N-Q1, 2, 3
20. Students will create a preventative maintenance schedule for a corporate network of computers based on multiple system event	1A-C 2F	1 2	2 4	A 1.0 A 2.0	LS 11-12.1 RSIT 11-12.7

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
logs. Students will read actual computer logs and chart identifiable patterns that are a prelude to a larger failure and also try to identify missing maintenance steps and suggest a better strategy in their accompanying advisory report. Students will report out to the class as if they were advising the board of a company.*	4F 8B, E 9A, I 12B	4 5 10 11 12	5 10	A 6.0 A 7.0 A 8.0	SLS 11-12.1 WS 11-12.4
21. In small groups students will create a video that explains in layman's terms the permanency of data (on cell phones, computers, GPS units, etc.) and how it can impact personal privacy.*	1A-D 2A, D, F, I 5C 6A, F-I 9A, B 11A-C, E	1 2 4 9 10 12	2 4 5 8	A 3.0 A 5.0 A 7.0	LS 11-12.6 SLS 11-12.1 WS 11-12.6

* = UC a-g required assignment

Standards Assessed in this Program

Career Ready Practices

1. **Apply appropriate technical skills and academic knowledge.**
2. **Communicate clearly, effectively, and with reason.**
3. **Develop an education and career plan aligned to 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 well-being.**
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/global competence.**
10. **Demonstrate creativity and innovation.**
11. **Employ valid and reliable research strategies.**
12. **Understand the environmental, social, and economic impacts of decisions.**

Anchor Standards

2.0 Communications

- Acquire and use accurately sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.

3.0 Career Planning and Management

- Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans.

4.0 Technology

- Use existing and emerging technology, to investigate, research, and produce products and services, including new information, as required in the sector workplace environment.

5.0 Problem Solving and Critical Thinking

- Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.

6.0 Health and Safety

- Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the sector workplace environment.

7.0 Responsibility and Flexibility

- Initiate, and participate in, a range of collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the sector workplace environment and community settings.

8.0 Ethics and Legal Responsibilities

- Practice professional, ethical, and legal behavior, responding thoughtfully to diverse perspectives and resolving contradictions when possible, consistent with applicable laws, regulations, and organizational norms.

9.0 Leadership and Teamwork

- Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution.

10.0 Technical Knowledge and Skills

- Apply essential technical knowledge and skills common to all pathways in the sector following procedures when carrying out experiments or performing technical tasks.

Pathway Standards

Information and Communication Technologies - Information Support and Services

A 1.0 Describe the role information and communication technologies in organizations.
A 2.0 Acquire, install, and implement software and systems.
A 3.0 Access and transmit information in a networked environment.
A 4.0 Administer and maintain software and systems.
A 5.0 Identify requirements for maintaining secure network systems.
A 6.0 Diagnose and solve software, hardware, networking, and security problems.
A 7.0 Support and train users on various software, hardware, and network systems.
A 8.0 Manage and implement information, technology, and communication projects.

Common Core State Standards

ENGLISH LANGUAGE ARTS

Language Standards

LS 11-12.6: Acquire and use accurately 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.

Reading Standards for Information Text

RSIT 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.

Speaking and Listening Standards

SLS 11-12.1: 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 11-12.1d: 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 11-12.2: 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.

Writing Standards

WS 11-12.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
WS 11-12.6: 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.
WS 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.

MATHEMATICS

Algebra – A-CED – Creating Equations

A-CED 2: Create equations in two or more variable to represent relationships between quantities: graph equations on coordinate axes with labels and scales.

Functions –F-IF- Interpreting Functions

F-IF 2: Use function notation, evaluate functions for inputs in their domains, and interprets statements that use function notation in terms of a context.
F-IF 4: For a function that models a relationship between two quantities interpret key features of graphs and tales in terms of the quantities, and sketch graphs showing key features given a verbal description. For example, if the function h(n), gives the number of a person-hours it takes to assemble n engines in a factory, then the positive interferes would be an appropriate domain for the function.

Numbers and Quantities –N-Q- Quantities

N-Q1: Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
N-Q2: Define appropriate quantities for the purpose of descriptive modeling.
N-Q3: Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

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A-G Approved Key Assignments

1. Students will create an application capable of sending/receiving remote messages and files.
2. Students will rebuild File Allocation Tables by using boot sector readers and utilities such as FTK or NTFS readers, etc.
3. Students will measure the geometry of hard drive disks using CHS calculations (cylinders, heads, sectors) to determine storage capacity.
4. Using Debug, students will clean wipe a hard drive by resetting all binary bits to 0 on Interrupt 13.
5. Students will utilize Sysprep to deploy an image of Microsoft OS for departmental use.
6. Utilizing Acronis, students will deploy and backup Microsoft OS over a network.
7. Students will write a two-page reflection paper on the following topic: “American citizens are asking for more security and simultaneously demanding more privacy. Where do we draw the line?”
8. In a 5-8 page paper, students will justify the use of digital forensics in civil and criminal court cases. They must draw evidence from informational texts to support their analysis and research.
9. In small groups students will create a digital presentation describing and detailing a current event that utilized digital forensics to identify the “who, what, and how” a cyber-attack occurred.