Course Description:
The course begins with fundamental JROTC Leadership Training. Cyber year one focuses on the foundational skills needed to begin a pathway into cybersecurity. It begins with an introduction to ethics and cybersecurity, moves on to global connectivity, and then transitions to understanding hardware, operating systems, networks, cryptography, and operating procedures. The course ends with a service learning-oriented capstone project that encourages problem solving and team building. This course covers topics associated with CompTIA A+ certification. Professional communication skills and practices, problem-solving, ethical, and legal issues, and the impact of effective presentation skills are enhanced in this course to prepare students to be college and career ready. Employability skills are integrated into activities, tasks, and projects throughout the course standards to demonstrate the skills required by business and industry. Competencies in the co-curricular student organizations are integral components of both the employability skills standards and content standards for this course.

Army JROTC Cyber 1 is the first course in the Army JROTC Cybersecurity pathway in the Government and Public Administration career cluster. There is no pre-requisite for this course.

GPA-ACYB1-1
The following standard is included in all CTAE courses adopted for the Career Cluster/Pathways. Teachers should incorporate the elements of this standard into lesson plans during the course. The topics listed for each element of the standard may be addressed in differentiated instruction matching the content of each course. These elements may also be addressed with specific lessons from a variety of resources. This content is not to be treated as a unit or separate body of knowledge but rather integrated into class activities as applications of the concept.

Standard: Demonstrate employability skills required by business and industry.
The following elements should be integrated throughout the content of this course.

1.1 Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.
<table>
<thead>
<tr>
<th>Nonverbal Communication</th>
<th>Written Communication</th>
<th>Speaking</th>
<th>Applications and Effective Résumés</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicating Nonverbally</td>
<td>Writing Documents</td>
<td>Using Language Carefully</td>
<td>Completing a Job Application</td>
</tr>
<tr>
<td>Reading Body Language and Mixed Messages</td>
<td>Constructive Criticism in Writing</td>
<td>One-on-One Conversations</td>
<td>Writing a Cover Letter</td>
</tr>
<tr>
<td>Matching Verbal and Nonverbal Communication</td>
<td>Small Group Communication</td>
<td>Selling Yourself in a Résumé</td>
<td></td>
</tr>
<tr>
<td>Improving Nonverbal Indicators</td>
<td>Large Group Communication</td>
<td>Terms to Use in a Résumé</td>
<td></td>
</tr>
<tr>
<td>Nonverbal Feedback</td>
<td>Making Speeches</td>
<td>Describing Your Job Strengths</td>
<td></td>
</tr>
<tr>
<td>Showing Confidence Nonverbally</td>
<td>Involving the Audience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Showing Assertiveness</td>
<td>Answering Questions</td>
<td>Organizing Your Résumé</td>
<td></td>
</tr>
</tbody>
</table>

### 1.2 Demonstrate creativity by asking challenging questions and applying innovative procedures and methods.

<table>
<thead>
<tr>
<th>Teamwork and Problem Solving</th>
<th>Meeting Etiquette</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thinking Creatively</td>
<td>Preparation and Participation in Meetings</td>
</tr>
<tr>
<td>Taking Risks</td>
<td>Conducting Two-Person or Large Group Meetings</td>
</tr>
<tr>
<td>Building Team Communication</td>
<td>Inviting and Introducing Speakers</td>
</tr>
<tr>
<td></td>
<td>Facilitating Discussions and Closing</td>
</tr>
<tr>
<td></td>
<td>Preparing Visual Aids</td>
</tr>
<tr>
<td></td>
<td>Virtual Meetings</td>
</tr>
</tbody>
</table>

### 1.3 Exhibit critical thinking and problem-solving skills to locate, analyze and apply information in career planning and employment situations.

<table>
<thead>
<tr>
<th>Problem Solving</th>
<th>Customer Service</th>
<th>The Application Process</th>
<th>Interviewing Skills</th>
<th>Finding the Right Job</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transferable Job Skills</td>
<td>Gaining Trust and Interacting with Customers</td>
<td>Providing Information, Accuracy and Double Checking</td>
<td>Preparing for an Interview</td>
<td>Locating Jobs and Networking</td>
</tr>
<tr>
<td>Becoming a Problem Solver</td>
<td>Learning and Giving Customers What They Want</td>
<td>Online Application Process</td>
<td>Questions to Ask in an Interview</td>
<td>Job Shopping Online</td>
</tr>
<tr>
<td>Identifying a Problem</td>
<td>Keeping Customers Coming Back</td>
<td>Following Up After Submitting an Application</td>
<td>Things to Include in a Career Portfolio</td>
<td>Job Search Websites</td>
</tr>
<tr>
<td>Becoming a Critical Thinker</td>
<td>Seeing the Customer’s Point</td>
<td>Effective Résumés: Traits Employers are Seeking</td>
<td>Participation in Job Fairs</td>
<td></td>
</tr>
<tr>
<td>Managing</td>
<td>Selling Yourself and the Company</td>
<td>Matching Your Talents to a Job</td>
<td>Considerations Before Taking a Job</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Handling Customer Complaints</td>
<td>When a Résumé Should be Used</td>
<td>Searching the Classified Ads</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strategies for Customer Service</td>
<td></td>
<td>Using Employment Agencies</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Landing an Internship</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Staying Motivated to Search</td>
<td></td>
</tr>
</tbody>
</table>
1.4  Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.

<table>
<thead>
<tr>
<th>Workplace Ethics</th>
<th>Personal Characteristics</th>
<th>Employer Expectations</th>
<th>Business Etiquette</th>
<th>Communicating at Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrating Good Work Ethic</td>
<td>Demonstrating a Good Attitude</td>
<td>Behaviors Employers Expect</td>
<td>Language and Behavior</td>
<td>Handling Anger</td>
</tr>
<tr>
<td>Behaving Appropriately</td>
<td>Gaining and Showing Respect</td>
<td>Objectionable Behaviors</td>
<td>Keeping Information Confidential</td>
<td>Dealing with Difficult Coworkers</td>
</tr>
<tr>
<td>Maintaining Honesty</td>
<td>Demonstrating Responsibility</td>
<td>Establishing Credibility</td>
<td>Avoiding Gossip</td>
<td>Dealing with a Difficult Boss</td>
</tr>
<tr>
<td>Playing Fair</td>
<td>Showing Dependability</td>
<td>Demonstrating Your Skills</td>
<td>Appropriate Work Email</td>
<td>Dealing with Difficult Customers</td>
</tr>
<tr>
<td>Using Ethical Language</td>
<td>Being Courteous</td>
<td>Building Work Relationships</td>
<td>Cell Phone Etiquette</td>
<td>Dealing with Conflict</td>
</tr>
<tr>
<td>Showing Responsibility</td>
<td>Gaining Coworkers’ Trust</td>
<td></td>
<td>Appropriate Work Texting</td>
<td></td>
</tr>
<tr>
<td>Reducing Harassment</td>
<td>Persevering</td>
<td></td>
<td>Understanding Copyright</td>
<td></td>
</tr>
<tr>
<td>Respecting Diversity</td>
<td>Handling Criticism</td>
<td></td>
<td>Social Networking</td>
<td></td>
</tr>
<tr>
<td>Making Truthfulness a Habit</td>
<td>Showing Professionalism</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Leaving a Job Ethically</td>
<td></td>
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</tr>
</tbody>
</table>

1.5  Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply teamwork skills.

<table>
<thead>
<tr>
<th>Expected Work Traits</th>
<th>Teamwork</th>
<th>Time Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrating Responsibility</td>
<td>Teamwork Skills</td>
<td>Managing Time</td>
</tr>
<tr>
<td>Dealing with Information Overload</td>
<td>Reasons Companies Use Teams</td>
<td>Putting First Things First</td>
</tr>
<tr>
<td>Transferable Job Skills</td>
<td>Decisions Teams Make</td>
<td>Juggling Many Priorities</td>
</tr>
<tr>
<td>Managing Change</td>
<td>Team Responsibilities</td>
<td>Overcoming Procrastination</td>
</tr>
<tr>
<td>Adopting a New Technology</td>
<td>Problems That Affect Teams</td>
<td>Organizing Workspace and Tasks</td>
</tr>
<tr>
<td>Expressing Yourself on a Team</td>
<td></td>
<td>Staying Organized</td>
</tr>
<tr>
<td>Giving and Receiving Constructive Criticism</td>
<td></td>
<td>Finding More Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Managing Projects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prioritizing Personal and Work Life</td>
</tr>
</tbody>
</table>

1.6  Present a professional image through appearance, behavior, and language.

<table>
<thead>
<tr>
<th>On-the-Job Etiquette</th>
<th>Person-to-Person Etiquette</th>
<th>Communication Etiquette</th>
<th>Presenting Yourself</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using Professional Manners</td>
<td>Meeting Business Acquaintances</td>
<td>Creating a Good Impression</td>
<td>Looking Professional</td>
</tr>
<tr>
<td>Introducing People</td>
<td>Meeting People for the First Time</td>
<td>Keeping Phone Calls Professional</td>
<td>Dressing for Success</td>
</tr>
<tr>
<td>Appropriate Dress</td>
<td>Showing Politeness</td>
<td>Proper Use of Work Email</td>
<td>Showing a Professional Attitude</td>
</tr>
<tr>
<td>Business Meal Functions</td>
<td></td>
<td>Proper Use of Cell Phone</td>
<td>Using Good Posture</td>
</tr>
<tr>
<td>Behavior at Work Parties</td>
<td></td>
<td>Proper Use in Texting</td>
<td>Presenting Yourself to Associates</td>
</tr>
<tr>
<td>Behavior at Conventions</td>
<td></td>
<td></td>
<td>Accepting Criticism</td>
</tr>
</tbody>
</table>
Leadership Education Training

Course Standard 2

GPA-ACYB1-2

Cadets will demonstrate organizational awareness through the application of communication skills and explore law, policy, and ethics as related to cybersecurity and Army JROTC.

2.1 Identify how social goals reflect the foundational values held by society; these core societal values are reflected in cybersecurity choices.

2.2 Foster personal growth through careful examination of what it means to utilize ethical reflection and judgement to consider potential harms, benefits, and tradeoffs involved in cybersecurity.

2.3 Interpret how ethical foundations are applied to situations rising from the interconnected world through examining diverse ethical dilemmas arising from cybersecurity practices that can cause ethical conflicts.

2.4 Compare various cybersecurity career paths to prepare for expanding job types related to cybersecurity.

2.5 Explore cybersecurity careers related to skills being taught and tie these careers to opportunities in industry, military, and associated work roles.

Introduction to Cybersecurity

Course Standard 3

GPA-ACYB1-3

Identify and apply basic concepts of cybersecurity, the Central Intelligence Agency triad, and types of cybersecurity attacks and associated risks.

3.1 List and describe the fundamental concepts of the cybersecurity discipline and put them into practice to provide system security.

3.2 Describe cybersecurity’s reliance on confidentiality, integrity, and availability – the Confidentiality, Integrity, and Availability (CIA) triad – and how it is implemented.

3.3 Cadets will be able to identify and describe common attack types and adversary types.

3.4 Cadets will be able to identify/analyze cybersecurity risk through the measure of potential damage or loss a vulnerability could cause weighed against the likelihood of an attack.
Global Connectivity

**Course Standard 4**

**GPA-ACYB1-4**

**Identify and explain key concepts of global connectivity including societal responses, the cyber system, networked systems and the evolution of the Internet.**

4.1 Discuss key historic events related to the evolution of computers and cybersecurity and delineate the impact of these events on society.

4.2 Recognize and analyze online and offline behaviors in societies (i.e., themselves, peers, families, communities, and countries) and deduce the values that govern these behaviors.

4.3 Explain how cyberspace is a very large, complex system of cyber systems that include hardware, software, social, economic, and political components.

4.4 Explain how the decentralized and dynamic nature of networked systems create the potential for a system to fail or behave incorrectly due a component the designer did not even know existed.

4.5 Summarize and interpret the impact of cybersecurity ideas and events on the evolution of the field.

4.6 Explain how the idea of the open Internet led us to new innovations that impact our daily lives and our security.

Hardware Standards and Resources

**Course Standard 5**

**GPA-ACYB1-5**

**Identify, explain, and apply knowledge of computer hardware equipment including assembly, maintenance, troubleshooting and software/hardware interface.**

5.1 Convey that computer hardware refers to the physical parts of a computer and related devices.

5.2 Identify how hardware and software work together in complex ways to achieve an overall objective.

5.3 Identify some common hardware-related vulnerabilities.

5.4 Demonstrate the ability to replace hardware/devices.

5.5 Demonstrate the installation of components within the display of a laptop.

5.6 Use appropriate laptop features.

5.7 Compare and contrast characteristics of various types of other mobile devices.

5.8 Connect and configure accessories and ports of other mobile devices.

5.9 Configure basic mobile device network connectivity and application support.

5.10 Use methods to perform mobile device synchronization.

5.11 Summarize power supply types and features.

5.12 Install and configure common devices.

5.13 Utilize the best practice methodology to resolve problems.

5.14 Troubleshoot problems related to motherboards, RAM, CPUs, and power.

5.15 Troubleshoot video, projector, and display issues.

5.16 Troubleshoot common mobile device issues while adhering to the appropriate procedures.

5.17 Troubleshoot common problems with printers.

5.18 Troubleshoot common wired and wireless network problems.
Virtualization and OS

Course Standard 6

GPA-ACYB1-6

Compare and explain the variety of computer systems including cloud, virtual, and physical.

6.1 Compare and contrast cloud computing concepts.
6.2 Set up and configure client-side virtualization.
6.3 Convey that computer hardware refers to the physical parts of a computer and related devices.
6.4 Describe the hardware components of modern computing environments and their individual functions.
6.5 Properly use the vocabulary associated with cybersecurity.

Operating Systems

Course Standard 7

GPA-ACYB1-7

Explain and apply software skills to initiate and maintain a network; utilize features of Linux to demonstrate basic cybersecurity operator functions.

7.1 Explain how cybersystems are complex systems.
7.2 Develop a script using Windows Command-Line Interface, Windows Management Instrumentation Command-Line (WMIC), and PowerShell to bring a network to an operational state per practical exercises.
7.3 Identify Windows processes using Sysinternals tools to maintain it in an operational state.
7.4 Demonstrate using the Registry hierarchy and primary components to check for suspicious activity in an operational environment.
7.5 Demonstrate security techniques on user accounts using WMIC, Windows Command-Line Interface, and PowerShell to maintain an operational environment.
7.6 Demonstrate an understanding of Linux Core Features by employing commands using common shells to analyze a Linux file system and parse HTML.
7.7 Describe the Linux boot process.
7.8 Identify Linux processes to bring a network to an operational state per the instruction given.
7.9 Analyze an audit log, identifying all activities that affect an operation, procedure, event, file, or document.
7.10 As a collection operator in an operational environment, Cadets will apply Linux operating system commands in accordance with applicable policy, instructions, doctrine, tactics, techniques, and procedures.
Introduction to Cryptography

**Course Standard 8**

**GPA-ACYB1-8**

**Investigate the uses of cryptography and apply key cryptography concepts.**

8.1 Properly use the vocabulary associated with cybersecurity.
8.2 Define cryptography and explain how it is used in data security.
8.3 Convert numbers into scientific notation.
8.4 Perform Modulo-2 addition.

Networking

**Course Standard 9**

**GPA-ACYB1-9**

**Explain secure network concepts and demonstrate the ability to set up a secure network.**

9.1 Differentiate between threats, vulnerabilities, and attacks.
9.2 Analyze how the cybersecurity attack lifecycle/kill chain is essential to adversarial thinking.
9.3 Convey that computer hardware refers to the physical parts of a computer and related devices.
9.4 Compare and contrast Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) ports, protocols, and their purposes.
9.5 Compare and contrast common networking hardware devices.
9.6 Install and configure a basic wired/wireless Small Office/Home Office (SOHO) network.
9.7 Compare and contrast wireless networking protocols.
9.8 Summarize the properties and purposes of services provided by networked hosts.
9.9 Explain common network configuration concepts.
9.10 Compare and contrast Internet connection types, network types, and their features.
9.11 Use appropriate networking tools.
9.12 Demonstrate security techniques on user accounts using WMIC, Windows Command-Line Interface, and PowerShell to maintain an operational environment.
9.13 Demonstrate their skills by applying Linux concepts in support of offensive and defensive cyber operations and successfully passing the Linux final examination.

Security

**Course Standard 10**

**GPA-ACYB1-10**

**Apply cybersecurity skills in a variety of scenarios including system security, threat evaluation, wireless security protocols, data security and disposal.**

10.1 Describe potential system attacks and the actors that might perform them.
10.2 Properly use the vocabulary associated with cybersecurity.
10.3 Evaluate physical and environmental security concerns.
10.4 Identify physical controls that are used to secure data.
10.5 Summarize the importance of physical security measures and explain logical security concepts.
10.6 Compare and contrast wireless security protocols and authentication methods.
10.7 Detect, remove, and prevent malware using appropriate tools and methods.
10.8 Compare and contrast social engineering, threats, and vulnerabilities.
10.9 Compare and contrast the differences of basic Microsoft Windows OS security settings.
10.10 Implement security best practices to secure a workstation and mobile devices.
10.11 Implement appropriate data destruction and disposal methods.

Operating Procedures

Course Standard 11

GPA-ACYB1-11

Identify, describe, and apply cybersecurity practices including security testing, documentation, change management, disaster prevention and recovery methods.

11.1 Describe appropriate measures to be taken should a system compromise occur.
11.2 Properly use the vocabulary associated with cybersecurity.
11.3 Conduct standard security testing and assessments.
11.4 Explain how cybersystems are complex systems.
11.5 Compare and contrast best practices associated with types of documentation.
11.6 Implement basic change management best practices.
11.7 Implement basic disaster prevention and recovery methods.
11.8 Explain common safety procedures, environmental impacts and appropriate controls, and the processes for addressing prohibited content/activity, and privacy, licensing, and policy concepts.
11.9 Utilize proper communication techniques and professionalism.
11.10 Identify the basics of scripting.
11.11 Utilize remote access technologies.

JROTC Leadership Education Training & Capstone Project

Course Standard 12

GPA-ACYB1-12

Cadets will work with a team to complete a cybersecurity service-learning project to benefit the school, community, or region.

12.1 Apply the knowledge and skills acquired in their courses to a service-learning project.
12.2 Extend academic experience into areas of personal career interests, to include working with new ideas, organizations, and individuals in a service-learning environment.
12.3 Apply creative and critical thinking about academic, professional, and/or social issues to further develop analytical and ethical leadership skills.