# Army Cybersecurity Junior Reserve Officers' Training Corps (JROTC)

# Office of the State Superintendent of Education
# Postsecondary and Career Education Division
# Career and Technical Education Department

**Christina Grant, Ed.D.**
**State Superintendent of Education**

**Antoinette Mitchell, Ph.D.**
**Assistant Superintendent, Postsecondary and Career Education**

**Kilin Boardman-Schroyer**
**Deputy Assistant Superintendent, Postsecondary and Career Education**

**Richard W. Kincaid**
**State Director, Career and Technical Education**

The purpose of this document is to communicate the required Career and Technical Education (CTE) academic standards for the Army Cybersecurity Junior Reserve Officers' Training Corps (JROTC) Program of Study. The academic standards in this document are theoretical and performance-based. The standards contain content from Colorado, Maryland, Tennessee, and Texas and were validated by D.C. business and industry partners. All content is used with permission.

In addition to academic standards, OSSE has incorporated into this document Labor Market Information (LMI) definitions and explanations for the Program of Study; program aligned Industry Recognized Credentials; and Work-Based Learning resources and requirements by course level.

This document is intended for use by educational administrators and practitioners. A similar document is available for each state-approved CTE Program of Study.

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## Army Cybersecurity Junior Reserve Officers' Training Corps (JROTC) Program of Study

| Course Level | Course Information | Description |
|---|---|---|
| **Level I** | **Army Cybersecurity, Leadership, Education, and Training I** **OSSEID:** Grades: 9-12 Prerequisite: None **Credit:** 1 | Army Cybersecurity, Leadership, Education, and Training I 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 transitions to understanding hardware, operating systems, networks, cryptography, and operating procedures. |
| **Level II** | **Army Cybersecurity, Leadership, Education, and Training II** **OSSEID:** Grades: 10-12 Prerequisite Army Cybersecurity, Leadership, Education, and Training I **Credit:** 1 | Army Cybersecurity, Leadership, Education, and Training I Description: This course delves into the more technical aspects of the field, providing a firm foundation in network architecture and security. Students also learn about cybersecurity crime and cybersecurity law while tying these concepts to citizenship and government. |
| **Level III** | **Army Cybersecurity, Leadership, Education, and Training III** **OSSEID:** Grades: 11-12 Prerequisite: Army Cybersecurity, Leadership, Education, and Training II **Credit:** 1 | Army Cybersecurity, Leadership, Education, and Training II Description: In Army Cybersecurity, Leadership, Education, and Training III, students build upon their understanding of security controls and risk management, cryptography, and system hardening. This is the first of two courses that will prepare students for the CompTia Security+ certification exam. |
| **Level IV** | **Army Cybersecurity, Leadership, Education, and Training IV** **OSSEID:** Grades: 12 Prerequisite: Army Cybersecurity, Leadership, Education, and Training III **Credit:** 1 | Army Cybersecurity, Leadership, Education, and Training IV students build upon Army LET III. Students explore digital forensics, threat modeling, and secure software development. When the course concludes, the students should be prepared to attempt CompTIA's Security+ certification exam. |

## Industry Certifications

CompTIA Security+

## Work-Based Learning Examples and Resources

| Level I Course | Level II Course | Level III Course | Level IV Course |
|---|---|---|---|
| **Career Exploration** Industry Visits Guest Speakers Participate in a CTSO | **Career Awareness** *All of Level I, plus:* Postsecondary Visits Program- Specific Site Tours Mock Interviews | **Career Preparation** *All of Level I and II, plus:* Job Shadow Paid/Unpaid Internships | **Career Preparation** Paid/Unpaid Internships Apprenticeships |

**Several resources are available to help instructors meet the Level I and Level II WBL requirements, including:**

**Career Coach DC** (http://careercoachdc.emsicc.com). Online site designed to help students find and connect to a career pathway by providing the most current local data on wages, employment, job postings, and associated education and training. The resource includes a Career Assessment for students.

**Nepris** (https://dc.nepris.com/). Connects educators and learners with a network of industry professionals virtually, bringing real-world relevance and career exposure to all students. Nepris also provides a skills-based volunteering platform for business and industry professionals to extend their educational outreach.

**Virtual Job Shadow** (https://virtualjobshadow.com). Provides interactive tools which empower students to discover, plan, and pursue their dreams. Rich video library presents a "day in the life of" view for thousands of occupations.

## Labor Market Information Definitions and Data

Career and Technical Education programs of study in the District of Columbia must meet at least one of the High Wage, High Skill, and In-Demand definitions below to be considered appropriate for our students and the regional labor market. These definitions were created in collaboration with Career and Technical Education leaders from District of Columbia LEAs, the University of the District of Columbia Community College, and national guidance from Research Triangle International (RTI) and Education Northwest. Additionally, previous work was consulted by researchers at MIT's Labor Wage Index Project and the DC CTE Task Force's 2012 Strategic Plan for the District of Columbia.

| Indicator | Definition | Data for the Army Cybersecurity Junior Reserve Officers' Training Corps (JROTC) Program of Study (source: EMSI, August 2022) |
|---|---|---|
| **High Wage** | Those occupations that have a 25th percentile wage equal to or greater than the most recent MIT Living Wage Index for one adult in the District of Columbia, and/or leads to a position that pays at least the median hourly or annual wage for the Washington, DC, metropolitan statistical area.<br><br>*Note: A 25th percentile hourly wage of $23.13 or greater is required to meet this definition.* | **Standard Occupational Code (SOC):**<br>15.1241.00 Computer Network Architect<br><br>**Hourly Wages**<br>**25th Percentile:** $50.99<br>**50th Percentile:** $65.71<br>**75th Percentile:** $82.81 |
| **High Skill** | Those occupations located within the Washington, DC, metropolitan statistical area with the following education or training requirements: completion of an apprenticeship program; completion of an industry-recognized certification or credential; associate's degree or higher. | **Typical Entry-Level Education:**<br>Bachelor's Degree |

| | | |
|---|---|---|
| **In-Demand** | Those occupations in the Washington, DC, metropolitan statistical area having more than the median number of total *(growth plus replacement)* annual openings over a five-year period.<br><br>*Note: An occupation is required to have an annual growth plus replacement rate of 105 openings, or greater, between 2021-2026 to meet this definition.* | **Annual Openings:** 1,124 |

## Model Six-Year Plan: Army Cybersecurity Junior Reserve Officers' Training Corps (JROTC)

**College:** University of the District of Columbia Community College
**Program/CIP:**
**Plan:**

**Entity:** Office of the State Superintendent of Education
**Career Cluster:** Government and Public Administration
**Program of Study:** Army Cybersecurity JROTC

| Subject | High School | | | | College | | | |
|---|---|---|---|---|---|---|---|---|
| | 9th Grade | 10th Grade | 11th Grade | 12th Grade | Semester I | Semester II | Semester III | Semester IV |
| **English (4)** | English I | English II | English III | English IV | | | | |
| **Math (4)** | Algebra I | Geometry | Algebra II | Math | | | | |
| **Science (4)** | Biology | Lab Science | Lab Science | Science | | | | |
| **Social Studies (4)** | World History and Geography I: Middle Ages | World History and Geography II: Modern World | U.S. History | U.S. Government (.5) and D.C. History (.5) | | | | |
| **Health (.5) and Physical Ed (1)** | Health (.5) Physical Ed (.5) | Physical Ed (.5) | | | | | | |
| **World Languages (2)** | | | World Language I | World Language II | | | | |
| **Art (.5)** | | Art (.5) | | | | | | |
| **Music (.5)** | | Music (.5) | | | | | | |
| **Elective / Major Courses** | Army Cybersecurity, Leadership, Education, and Training I | Army Cybersecurity, Leadership, Education, and Training II | Army Cybersecurity, Leadership, Education, and Training III | Army Cybersecurity, Leadership, Education, and Training IV | | | | |
| *Total possible college credits completed in high school: XX* | | | | | *Credit hours required to complete the AAS program: XX* | | | |

## Course Standards

## Army Cybersecurity, Leadership, Education, and Training I

1. **General Information.** This course is recommended for students in Grades 9-12. Students shall be awarded one credit for successful completion of this course.  Cadets are introduced to content that will develop leadership skills. Cadets are exposed to the traditions, organizations, structure, and discipline of JROTC. Cadets will also focus on the foundational skills needed to begin a pathway into cybersecurity. It begins with an introduction to ethics and cybersecurity, moves onto global connectivity, and then transitions to understanding hardware, operating systems, networks, cryptography, and operating procedures.

2. **Introduction.**
   A. Career and technical education instruction provide content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.

   B. The Government and Public Administration Career Cluster focuses on planning and performing governmental functions at the local, state, and federal levels, including governance, national security, foreign service, planning, revenue and taxation, and regulations.

   C. In Army Cybersecurity, Learning, Education, and Training I, students focus on citizenship principles, leadership theory, communication/study skills, history, customs, and courtesies. Cadets will explore behavioral preferences, interpersonal skills and abilities, and strategies to help build personal success in the high school classroom, the JROTC program, and the Cadet's community. Cadets will be able to identify the individual role responding to commands and moving with precision is essential when participating in drill exercises at future competitions or community events. Cadets will apply a process and system for addressing goals and handling conflict, both internally and with others. Cadets will examine ways to address and manage stress in life. Physical fitness is one effective strategy for maintaining health and is an essential component of this JROTC program through the Cadet Challenge. Army Cybersecurity, Learning, Education, and Training I, uses humanity-based concepts to increase cyber awareness among high school students. Army Cybersecurity, Learning, Education, and Training I address the opportunities, threats, responsibilities, and legal constraints associated with living and working in cyberspace.

   D. Students will participate in at least two Career Exploration Work-Based Learning experiences in this course, which might include guest speakers and workplace tours relevant to the program of study.

   E. Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.

3. **Knowledge and skills.**

A. **The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:**
   1. communicate effectively with others using oral and written skills;
   2. demonstrate collaboration skills through teamwork;
   3. demonstrate professionalism by conducting oneself in a manner appropriate for the profession and workplace;
   4. demonstrate a positive, productive work ethic by performing assigned tasks as directed;
   5. how integrity by choosing the ethical course of action and complying with all applicable rules, laws, and regulations; and
   6. demonstrate time-management skills by prioritizing tasks, following schedules, and tending to goal-relevant activities in a way that uses time wisely and optimizes efficiency and results.

B. **The Cadet describes how the Army JROTC program promotes personal success and citizenship. The Cadet is expected to:**
   1. describe the origin of the Army JROTC program;
   2. describe activities you will participate in as a Cadet;
   3. identify the program outcomes of the Army JROTC program; and
   4. explain the mission and benefits of the Army JROTC program state the Army JROTC Cadet Creed.

C. **The Cadet analyze the organization and traditions of JROTC programs. The cadet is expected to:**
   1. explain the organization of JROTC programs;
   2. explain the lines of responsibility and authority in JROTC programs;
   3. correlate duties and responsibilities with positions in the JROTC battalion;
   4. explain uniform wear and history;
   5. explain the purpose of uniform wear, restrictions, and standards;
   6. describe Cadet appearance and grooming standards;
   7. identify military rank and grade insignia;
   8. demonstrate placement of uniform awards, insignias, and decorations; and
   9. classify the components of individual award categories, define award criteria.

D. **The Cadet demonstrates customs and courtesies in the JROTC environment. The cadet is expected to:**
   1. explain how our nation arrived at the current design of the United States flag;
   2. explain the symbolism of the parts and colors on the United States flag;
   3. explain the origin of the lyrics in our national anthem;
   4. demonstrate a salute;
   5. demonstrate the correct way to fold the United States flag;
   6. compare the rules for displaying the United States flag in different situations;
   7. describe customs when the national anthem is played;
   8. explain why there are rules for saluting and addressing officers;
   9. distinguish among the types of personal salutes and when they are executed; and
   10. identify situations requiring a salute or other forms of respect to senior officers.

E. **The Cadet demonstrates proper etiquette in social. The cadet is expected to:**
   1. analyze etiquette and manners in formal and informal settings;

2. explain the handling of social invitations;
3. demonstrate proper dining etiquette; and
4. correlate the historical significance of Dining-in, Dining-Out to the Cadet Ball.

F. **The Cadet uses thinking maps to enhance learning. The cadet is expected to:**
1. identify the types of thinking processes;
2. relate thinking to learning;
3. correlate thinking processes to the eight thinking maps; and
4. utilize Thinking Maps to visually represent a learning objective.

G. **The Cadet determines his behavioral preferences. The cadet is expected to:**
1. explain the four clusters of behavior in the Winning Colors framework;
2. illustrate your behavioral preferences using the four Winning Colors;
3. identify strengths for each behavior cluster; and
4. express appreciation for your own uniqueness.

H. **The Cadet Applies an appreciation of diversity to interpersonal situations. The cadet is expected to:**
1. explain how awareness-enhancing behavior affect better communication with others;
2. identify key characteristics for each Winning Colors behavior cluster: Planners, adventures, and relaters;
3. determine factors that impact the behavior of others;
4. evaluate factors that impact how others perceive individual behavior; and
5. select behaviors that promote success in a variety of situations.

I. **The Cadet analyzes how thinking and learning affects his academic performance. The cadet is expected to:**
1. distinguish between active and passive learner traits;
2. explain how creative and critical thinking work together;
3. describe the difference between objective and subjective thinking;
4. explain the essential elements of the learning process;
5. examine different models of learning preferences;
6. describe the eight types of intelligences; and
7. explore how to expand your learning preferences and your intelligences.

J. **The Cadet applies strategies for reading comprehension. The cadet is expected to:**
1. identify the purpose of reading;
2. distinguish among reading comprehension strategies;
3. distinguish among the types of context clues readers use to determine word meaning;
4. recognize how to apply strategies that build your vocabulary; and
5. relate how vocabulary contributes to reading comprehension.

K. **The Cadet develops study skills and test-taking strategies. The cadet is expected to:**
1. describe effective study habits;
2. demonstrate effective textbook reading strategies;
3. analyze effective note-taking strategies; and
4. explain effective strategies for test preparation and test-taking.

L. **The Cadet Identifies security vulnerabilities for devices and their network connections. The cadet is expected to:**
   1. identify the need for cybersecurity in addressing vulnerabilities in networks;
   2. understand and apply the Confidentiality, Integrity, and Availability (CIA) for prioritization of critical security resources;
   3. identify common attack types and adversary types; and
   4. describe "risk" as it pertains to cybersecurity.

M. **The Cadet uses hardware design, operation, and maintenance knowledge and skills to identify major computer components. The cadet is expected to:**
   1. identify the purpose and function of computer components in the operation of the computer system such as central processing unit, motherboard, sockets, chipsets, basic input and output system and their drivers, memory, hard drive technologies, video cards, input and output devices and ports, and modem and network interface cards (NIC);
   2. identify how mobile devices such as personal data assistants and cell phones operate;
   3. identify how mobile devices such as personal data assistants and cell phones connect and share data;
   4. demonstrate an understanding of the rationale behind error messages and symptoms of hardware failures;
   5. research interrupt sequences and beep codes;
   6. and identify priorities and interrupts at the system level.

N. **The Cadet demonstrates knowledge of Global Connectivity. The cadet is expected to:**
   1. identify the components of a network, the relationship between routers, switches, servers, topology, and addressing;
   2. explain the relationship between Internet security, web security, network security and cybersecurity;
   3. explain internet security;
   4. Describe the process of packet transmission; and
   5. identify internet vulnerabilities.

O. **The Cadet applies Virtualization and O.S. knowledge. The cadet is expected to:**
   1. explain Cloud Computing;
   2. compare & contrast cloud computing concepts;
   3. configure client-side virtualization;
   4. identify Hypervisors; and
   5. understand virtual machines, cloud computing and their vulnerabilities.

P. **The Cadet demonstrates knowledge of Operating Systems. The cadet is expected to:**
   1. identify types of operating systems;
   2. demonstrate proficiency in Windows: installation, configuration, account management; updates and security, CMD line/PowerShell, registry, and troubleshooting;
   3. install and support Windows O.S. client support;
   4. demonstrate knowledge in Linux: installation, configuration, account management, updates and security, scripting, and troubleshooting;
   5. understand Mac OS, Linux and mobile O.S.; and
   6. identify Common host-based attacks.

Q. **The Cadet demonstrates the use of Cryptography. The cadet is expected to:**
1. identify the need, uses and types of cryptography; and
2. convert numbers to scientific notation and modulo-2 addition.

R. **The Cadet understands the operation of data networking. The cadet is expected to:**
1. compare and contrast TCP and UDP ports, protocols, and their purposes;
2. install and configure a basic wired/wireless SOHO network;
3. Explain Building Local Area Networks;
4. identify Secure Networking; and
5. identify Common network based attacks.

S. **The Cadet Identifies the various levels of Security. The cadet is expected to:**
1. identify common security threats.;
2. explain physical security;
3. employ effective incident response;
4. identify wifi security standards;
5. explain device hardening; and
6. demonstrate data destruction.

T. **The Cadet understands and demonstrates Operating Procedures. The cadet is expected to:**
1. examine documentation and change management;
2. identify social engineering attacks;
3. explain disaster prevention/recovery;
4. explain incident response; and
5. demonstrate best practices for safety, environmental impacts, communication and professionalism.

U. **The student develops technology skills. The student is expected to:**
1. use technology as a tool to research, organize, evaluate, and communicate information;
2. use digital technologies (computers, pdas, media players, gpss, etc.), communication/networking tools, and social networks appropriately to access, manage, integrate, evaluate, and create information to successfully function in a knowledge economy;
3. demonstrate utilizing current and new technologies specific to the program of study, course; and/or industry; and
4. apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies.

# Army Cybersecurity, Leadership, Education, and Training II

1. **General requirements.** This course is recommended for students in Grades 10-12. Prerequisites: Leadership Education and Training (LET) 2 builds upon the mastery of LET 1 skills and abilities, providing Cadets with new and more challenging opportunities in leadership development. There are 24 lessons within eight chapters. Students will also be able to demonstrate the collection, storage and protection of data; cybersecurity attacks and threats; and technology to improve information security.

2. **Introduction**
   A. Career and technical education instruction provide content aligned with challenging academic standards and relevant technical knowledge and skills to further their education and succeed in current or emerging professions.

   B. The Government and Public Administration Career Cluster focuses on planning and performing governmental functions at the local, state, and federal levels, including governance, national security, foreign service, planning revenue and taxation, and regulations.

   C. In Army Cybersecurity, Learning, Education, and Training II, students focus on the elements of leadership, encouraging the analysis of personal leadership attributes and their relationship to program goals. Cadets focus on communication, writing, listening, and speaking and examine the role ethics plays in leadership and how core values effect their personal code of conduct. Cadets are introduced to new challenges and opportunities for team and squad drill leaders.  Cadets are exposed to the citizens' role in helping others during an emergency; cadets will explain first aid response to common and severe emergencies. Cadets focus on making good choices and decisions in situations that involve bullying and violence. Cadets focus on nutrition, body image, and the elements of good health. Cadets are provided an opportunity to participate but also evaluate the effectiveness of a service-learning project and after-action review with teams and making decisions toward continuous improvement of service to others. Cadets are introduced to the purpose of government and the role of the U.S. Constitution on democracy and the rights of its citizens.  Army Cybersecurity, Learning, Education, and Training II explores the difference between a criminal and moral wrong, protections and intellectual property, the functions and uses of permanent electronic records and the role of laws in addressing social changes.

   D. Students will participate in at least two Career Exploration Work-Based Learning experiences in this course, which might include guest speakers and workplace tours relevant to the program of study.

   E. Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.

3. **Knowledge and skills**
   A. **The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:**
      1. communicate effectively with others using oral and written skills;
      2. demonstrate collaboration skills through teamwork;
      3. demonstrate professionalism by conducting oneself in a manner appropriate for the profession and workplace;
      4. demonstrate a positive, productive work ethic by performing assigned tasks as directed;
      5. how integrity by choosing the ethical course of action and complying with all applicable rules, laws, and

regulations; and

6. demonstrate time-management skills by prioritizing tasks, following schedules, and tending to goal-relevant activities in a way that uses time wisely and optimizes efficiency and results.

B. **The cadet identifies the elements of leadership. The cadet is expected to:**
1. Identify leadership opportunities in JROTC;
2. Explain how perspectives on leadership have changed over time;
3. Define leadership; and
4. Describe the Leadership Model.

4. **The cadet analyzes leadership attributes. The cadet is expected to:**
1. Describe the leadership attribute of character;
2. Subscribe the leadership attribute of presence;
3. Describe the leadership attribute of intellect; and
4. Analyze how character, presence, and intellect affect leadership.

B. **The cadet analyzes leadership competencies. The cadet is expected to:**
1. Describe the competencies involved in leading your team;
2. Describe the competencies involved in developing your team members;
3. Describe the competencies involved in achieving results for your team; and
4. Analyze how leadership competencies impact goals.

C. **The cadet applies the appropriate leadership styles. The cadet is expected to:**
1. Describe how to identify the willingness and readiness of team members;
2. Identify three different styles of leadership; and
3. Choose the most effective leadership style for various situations.

D. **The cadet develops communication skills. The cadet is expected to:**
1. Compare verbal and nonverbal means of communication;
2. Identify the steps of effective communication;
3. Relate how the process of listening is essential to good communication;
4. Distinguish among the types of listening;
5. Identify barriers that prevent effective listening;
6. Explain the types of roles individuals play in a group; and
7. Identify how roles in a group affect communication.

E. **The cadet demonstrates effective writing skills. The cadet is expected to:**
1. Identify various reasons for writing;
2. Distinguish among the principles of good writing;
3. Confirm the basics of writing; and
4. Explore the common pitfalls and mistakes in writing.

F. **The cadet delivers a speech that he writes. The cadet is expected to:**
1. Compare the various types of speeches;
2. Analyze the purpose and audience for a speech;
3. Relate the elements of effective writing to speech writing;

4. Develop coping strategies for stressful speaking situations; and
5. Identify ways to improve speaking skill.

G. **The cadet analyzes career possibilities and requirements. The student is expected to:**
1. Distinguish between a job and a career;
2. Explain the various types of jobs that interest you;
3. Explore various Career Pathways;
4. Associate your interest and aptitude to a career path;
5. Examine career opportunities provided by the U.S. Military; and
6. Distinguish between various postsecondary education options.

H. **The cadet relates ethical concepts to personal code of conduct. The cadet is expected to:**
1. Relate ethics to personal standards;
2. Examine how ethical qualities affect leadership;
3. Explore the types of values; and
4. Compare the core values of the U.S. Military Services.

I. **The cadet assesses personal qualities as a team member. The cadet is expected to :**
1. Describe the characteristics of individual responsibility, followership, and teamwork;
2. Describe the responsibilities of a team leader and the leadership factors that affect teamwork; and
3. Describe the three stages of team building.

J. **The cadet demonstrates the skills and responsibilities of a good drill leader. The cadet is expected to:**
1. Describe the preparation a drill leader takes before a drill;
2. Identify five attributes of a capable drill leader; and
3. Identify the types of drill commands.

K. **The cadet illustrates the duties of a team leader or squad leader. The cadet is expected to:**
1. Describe the duties and responsibilities of the team and squad leader position within a platoon;
2. Explain the four steps leaders should use when assuming a new leadership position; and
3. Demonstrate the responsibilities of a team leader and squad leader.

L. **The cadet assesses first aid emergencies. The cadet is expected to:**
1. Identify ways to prepare for an emergency;
2. Describe universal precautions;
3. Explain the four emergency guidelines; and
4. Explain the sequence for evaluating an injured person.

M. **The cadet explains how to respond to common injuries. The cadet is expected to:**
1. Describe how to treat minor cuts;
2. Describe how to treat and prevent insect bites;
3. Describe how to treat animal bites;
4. Describe how to treat minor burns;
5. Describe how to remove a foreign object in the eye;
6. Describe how to stop a nosebleed;
7. Describe how to help someone who has fainted; and
8. Identify injuries that may require medical attention.

N. **The cadet describes first aid for severe emergencies. The cadet is expected to:**
   1. Identify the symptoms of choking, severe bleeding, heart attack, stroke, and shock;
   2. Describe first aid for choking;
   3. Describe first aid for severe bleeding;
   4. Explain when CPR and/or an AED should be used;
   5. Describe how to perform chest-only CPR;
   6. Describe first aid for heart attack;
   7. Describe first aid for stroke; and
   8. Describe first aid for shock.

O. **The cadet evaluates methods to protect yourself and others from bullying. The cadet is expected to:**
   1. Describe three types of bullying;
   2. Explain how cyberbullying is different from other types of bullying;
   3. Identify risk factors for bullying;
   4. Explain strategies for dealing with bullying; and
   5. Describe the effects of bullying.

P. **The cadet applies strategies to prevent violence. The cadet is expected to:**
   1. Examine the problem of violence in our society;
   2. Identify ways to prevent violence in schools;
   3. Identify risk factors for teen violence; and
   4. Describe strategies for preventing violence.

Q. **The cadet examines element of health. The cadet is expected to:**
   1. Identify the elements of health;
   2. Describe how what you eat impacts health;
   3. Describe how exercise impacts health;
   4. Identify how stress impacts overall health;
   5. Identify causes for lack of sleep;
   6. Explain how lack of sleep affect the brain; and
   7. Identify unsafe behaviors.

R.  **The cadet develops ways to increase fitness level. The cadet is expected to:**
   1. Identify the benefits of exercise;
   2. Describe ways to increase your fitness level;
   3. Examine methods for increasing aerobic capacity, strength and endurance, and flexibility;
   4. Create a plan to set and achieve personal fitness goals; and
   5. Explore methods to monitor your fitness progress.

S. **The cadet develops a personal nutritional plan to promote health. The cadet is expected to:**
   1. Identify common influences on food choices;
   2. Describe how the body uses the six types of nutrients;
   3. Explain how substances added to foods, such as fats, sugars and sodium, can impact your health;
   4. Explain how to read food labels;
   5. Identify key factors in making healthy food choices; and
   6. Explain how eating right and exercising can impact your health.

T.  **The cadet examines how body image, eating, and physical activity affect whole health. The cadet is expected to:**
1. Define body image;
2. Describe how to measure body composition;
3. Compare the factors that influence overweight and underweight people;
4. Explain how to balance exercise and calories for an appropriate weight; and
5. Describe the symptoms of eating disorders.

U.  **The cadet evaluates the effectiveness of a service-learning project. The cadet is expected to:**
1. Describe a service-learning experience using the four-quadrant model;
2. Identify the three stages of the after action review; and
3. Identify the three types of service.

V.  **The cadet investigates Cybersecurity Ethics, Crime & Cybersecurity Law. The cadet is expected to:**
1. Discuss ethics as they relate to cybersecurity and privacy;
2. Describe the types of cybercrime; and
3. List common cybersecurity legislation.

W.  **The cadet examines Networking Policies and Best Practices. The cadet is expected to:**
1. Describe organizational human resource policies, processes, and procedures;
2. Explain Export Control as it relates to cybersecurity;
3. Integrate system development life cycle;
4. Describe Safety; and
5. Explain the importance of the incident response process.

X.  **The cadet demonstrates Networking Topologies and Technologies knowledge and Advance Networking Technologies. The cadet is expected to:**
1. Explain the Open Systems Interconnection (OSI) model by defining each of the layers and their functions;
2. Examine network topologies to understand data flows through the network; and
3. Describe Network device installation and configuration.

Y.  **The cadet demonstrates I.P. addressing knowledge. The cadet is expected to;**
1. Describe numbering systems;
2. Identify classes;
3. Describe Subnetting; and
4. Compare and Contrast IPv4 versus IPv6.

Z.  **The cadet identifies Ports and Protocols:**
1. Describes networking Protocols and ports;
2. Explain networking Protocol types; and
3. Describe remote access technology concepts.

AA. **The cadet explores Routing & Switching. The cadet is expected to:**
1. Identify Properties;
2. Describe Segmentation;
3. Explain Routing;
4. Describe Performance; and
5. Identify Switching types.

BB. **The cadet analyzes Network Services. The cadet is expected to:**
1. Explain the function of Domain Name System;
2. Implement Dynamic Host Configuration Protocol;
3. Describe Network Time Protocol; and
4. Explain I.P. Address Management.

CC. **The cadet demonstrates Network Troubleshooting Tools and Techniques. The cadet is expected to:**
1. Describe common networking attacks;
2. Describe common network service issues;
3. Demonstrate troubleshooting methodology;
4. Identify troubleshooting hardware tools;
5. Identify troubleshooting software tools and
6. Identify connectivity and performance hardware issues.

DD. **The cadet employs Virtualization & Cloud Computing. The cadet is expected to:**
1. Use Virtual networking; and
2. Manage Cloud computing.

EE. **The student develops technology skills. The student is expected to:**
1. Use technology as a tool to research, organize, evaluate, and communicate information;
2. Use digital technologies (computers, PDAs, media players, GPSs, etc.), communication/networking tools, and social networks appropriately to access, manage, integrate, evaluate, and create information to successfully function in a knowledge economy;
3. Demonstrate utilizing current and new technologies specific to the program of study, course, and/or industry; and
4. Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies.

# Army Cybersecurity, Leadership, Education, and Training III

1. **General requirements.** This course is recommended for students in Grades 11-12. Prerequisites: This course builds upon the mastery of LET 1 and 2 skills and abilities, providing cadets with new and more challenging opportunities as a leader by overseeing planning project implementation and personnel.  There are 20 active learning lessons within seven chapters. Students will be able to demonstrate the collection, storage, usage, and protection of data, cybersecurity attacks and threats, and technology to improve information security.

2. **Introduction.**
   A. Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education andsucceed in current or emerging professions.

   B. The Government and Public Administration Career Cluster focuses on planning and performing governmental functions at the local, state, and federal levels, including governance, national security, foreign service, planning revenue and taxation, and regulations.

   C. In Army Cybersecurity, Learning, Education, and Training III, students demonstrate collection, storage, usage, and protection of data; Cybersecurity attacks and threats, and technology to improve information security, evaluate their personal management skills, focus on personal planning and management, making plans for college, military, or workplace, cadets develop a career portfolio to showcase their JROTC program and academic achievements, develop opportunity to use strategies for neutralizing prejudice in relationships and negotiate an agreement, look at the effects of substance use and abuse on health, create a service-learning plan, organize teams, look deeper at the citizen's role in society.

   D. Students will participate in at least two Career Exploration Work-Based Learning experiences in this course, which might include guest speakers and workplace tours relevant to the program of study.

   E. Students are encouraged to participate in extended learning experiences such as career and technicalstudent organizations and other leadership or extracurricular organizations.

3. **Knowledge and skills**
   A. **The student demonstrates professional standards/employability skills as required by business and industry. The cadet is expected to:**
      1. Communicate effectively with others using oral written skills;
      2. Demonstrate collaboration skills through teamwork;
      3. Demonstrate professionalism by conducting oneself in a manner appropriate for the profession and workplace;
      4. Demonstrate a positive, productive work ethic by performing assigned tasks as directed;
      5. How integrity by choosing the ethical course of action and complying with all applicable rules, laws, and regulations; and
      6. Demonstrate time-management skills by prioritizing tasks, following schedules, and tending to goal-relevant activities in a way that uses time wisely and optimizes efficiency and results.

   B. **The cadet identifies and reviews Governance, Risk, and Compliance. Thecadet is expected to:**
      1. Identify Controls and Organizational Consequences of Privacy & Data Breaches;
      2. Identify and use Data Types and Privacy Technologies;

3. Review Data Roles, Regulations, Standards, & Legislation;
4. Identify Personnel, Third-parties, and Data Classification; and
5. Employ Physical Control.

C. **The cadet identifies threats, threats actors, attributes, and strategies. The cadet is expected to:**
   1. Identify types of threats and types of actors;
   2. Recognize Attack Vectors and Attack Indicators;
   3. Identify security concerns associated with vulnerabilities; and
   4. Demonstrate Cryptography and PKI skills.

D. **The cadet applies Account Management Controls. The cadet is expected to:**
   1. Identify controls and account types;
   2. Demonstrate knowledge of and implement Policies;
   3. Review Authentication Methods; and
   4. Recognize and implement Security Solutions.

E. **The cadet configures and verifies System architecture. The cadet is expected to:**
   1. Demonstrate Configuration Management;
   2. Describe Data Ownership & Protection;
   3. Demonstrate knowledge of Secure Network Designs;
   4. Manage Network Implementation;
   5. Host / Application Security;
   6. Explain Virtualization & Cloud Computing;
   7. Demonstrate Secure Wireless & Mobile knowledge; and
   8. Describe Embedded & Specialized Systems.

F. **The cadet explain how command and staff roles relate to leadership duties in your battalion. The cadet is expected to:**
   1. Examine common JROTC battalion command and staff structure; and
   2. Describe typical functions of a battalion commander and staff.

G. **The cadet Prepares to lead meetings. The cadet is expected to:**
   1. Describe how to plan for a meeting; and
   2. Explain the general rules for leading and participating in meetings.

H. **The cadet develops a plan for a battalion or school project. The cadet is expected to:**
   1. Describe the seven-step decision making process for projects / missions; and
   2. Identify command and staff roles in the planning / decision-making process.

I. **The cadet develops a continuous improvement plan for the JROTC battalion. The cadet is expected to:**
   1. Identify the battalion problem area or areas in need of improvement;
   2. Establish goals that facilitate continuous improvement;
   3. Outline milestones for progress toward the battalion goal;
   4. Document progress toward the goal; and
   5. Revise the plan based on the results of an evaluation.

J. **The cadet assesses personal management skills. The cadet is expected to:**

1. Explain how the five management skills contribute to preparation and execution of projects;
2. Compare management skills to leadership skills; and
3. Explain how time management strategies can improve effectiveness.

K. **The cadet applies a process for making ethical choices and resolving ethical dilemmas. The cadet is expected to:**
1. Identify questions that can help you make ethical choices;
2. Explain the process for resolving ethical dilemmas;
3. Identify pressures to be unethical; and
4. Explain how leaders can promote ethical behavior.

L. **The cadet analyses personal supervisory skills. The cadet is expected to:**
1. Identify the roles of a supervisor;
2. Explain how supervisors can improve team and individual performance; and
3. Describe examples of effective supervisory skills.

M. **The cadet creates a postsecondary action plan. The cadet is expected to:**
1. Explore various postsecondary options that support your career goals;
2. Determine the admissions process for postsecondary institutions;
3. Explore ways to finance postsecondary education;
4. Relate how the military can help you meet your career goals; and
5. Assess the personal and community benefits of AmeriCorps.

N. **The Cadet develops personal planning and management strategies. The cadet is expected to:**
1. Analyze the importance of time management;
2. Identify strategies for overcoming procrastination;
3. Explore time management strategies; and
4. Explore methods for managing your current and future schedule.

O. **The cadet creates a career portfolio. The cadet is expected to:**
1. Explain the importance of developing and maintaining a career portfolio;
2. Determine what types of documents and artifacts represent your personal achievements and goals;
3. Develop a resume to showcase your skills and abilities; and
4. Analyze aspects of interviewing.

P. **The cadet illustrates the duties of a platoon leader or sergeant. The cadet is expected to:**
1. Describe the duties and responsibilities of different leadership positions within a platoon;
2. Identify the responsibilities of a platoon sergeant and platoon leader.

Q. **The cadet develops strategies for neutralizing prejudice in their relationships. The cadet is expected to:**
1. Identify common stereotypes in our culture;
2. Explain how stereotypes relate to prejudice;
3. Describe ways prejudice affects behavior;
4. Analyze the causes of prejudice and discrimination; and
5. Determine strategies to lessen prejudice.

R. **The cadet uses negotiation strategies to make agreements. The cadet is expected to:**
1. Explain the relationship between conflict and negotiation;
2. Identify common reasons negotiations fail;

3. Describe the components of negotiations;
4. Explain the benefits and disadvantages of the five different approaches to negotiation; and
5. Explain how principled negotiations increase the outcome for win-win agreements.

S. **The cadet describes the effects of substance abuse. The cadet is expected to:**
1. Recognize the difference between drug use, misuse, and abuse;
2. Explain how substance abuse develops;
3. Describe the effects of substance abuse; and
4. Identify strategies for preventing substance abuse.

T. **The cadet assesses the impact of drug abuse on the whole health. The cadet is expected to:**
1. Explain how psychoactive drugs affect your brain;
2. Describe the health dangers of commonly abused drugs;
3. Explain why drug addiction is associated with criminal activity;
4. Describe the hazards of performance-enhancing drugs; and
5. Identify benefits of living drug free.

U. **The cadet assesses the impact of alcohol and tobacco on the whole health. The cadet is expected to:**
1. Explain how media influences the use of alcohol and tobacco;
2. Describe the health hazards of alcohol abuse;
3. Describe the health hazards of tobacco use; and
4. Identify reasons to refuse alcohol and tobacco.

V. **The cadet responds to substance abuse situations. The cadet is expected to:**
1. Explain how substance abuse is related to what people consider normal behavior;
2. Describe strategies for handling pressure to use alcohol, drugs, or tobacco; and
3. Explain how you can help someone who is a substance abuser.

W. **The cadet creates the plan and schedule for a service-learning project. The cadet is expected to:**
1. Assesses the role of teamwork in completing a service-learning project;
2. Develop a service-learning project schedule; and
3. Associate the roles and responsibilities of service-learning teams, recorder, timekeeper, facilitator, reporter, and debriefer.

X. **The cadet explains how the mandatory and voluntary responsibilities of citizens contribute to a strong community. The cadet is expected to:**
1. Describe the legal duties of U.S. citizens
2. Describe the voluntary responsibilities of citizens;
3. Explain the value of community involvement in building a strong nation;
4. Identify opportunity for civic involvement; and
5. Describe the benefits of civic involvement.

Y. **The cadet explains cybersecurity governance, risks and compliance.  The cadet is expected to:**
1. Explain the importance of policies, plans and procedures related to organizational security;
2. Summarize business impact analysis concepts;
3. Explain risk management processes and concepts;
4. Summarize basic concepts of forensics;
5. Compare and contrast various types of controls; and

6. Given a scenario, carry out data security and privacy practices.

Z. **The cadet compares and contrasts physical security and environmental controls. The cadet is expected to:**
1. Identify Environmental controls such as HVAC, Fire suppression, and EMI shielding;
2. Identify Physical Security; and
3. Identify Control Types.

AA. **The cadet utilizes cryptography and Public Key Infrastructures. The cadet is expected to:**
1. Given a scenario, utilize general cryptography concepts;
2. Given a scenario, use appropriate cryptographic methods; and
3. Given a scenario, use appropriate PKI, certificate management and associated components.

BB. **The cadet identifies and explains cybersecurity threats and vulnerabilities. The cadet is expected to:**
1. Explain types of malware;
2. Summarize various types of attacks;
3. Summarize social engineering attacks and the associated effectiveness with each attack;
4. Explain types of wireless attacks;
5. Explain types of application attacks;
6. Analyze a scenario and select the appropriate type of mitigation and deterrent techniques;
7. Given a scenario, use appropriate tools and techniques to discover security threats and vulnerabilities; and
8. the proper use of penetration testing versus vulnerability scanning.

CC. **The cadet applies strategies for Access Control and Identity Management.**
1. Compare and contrast the function and purpose of authentication services;
2. Given a scenario, select the appropriate authentication, authorization, or access control; and
3. Install and configure security controls when performing account management based on best practices.

DD. **The student develops technology skills. The student is expected to:**
1. use technology as a tool to research, organize, evaluate, and communicate information;
2. use digital technologies (computers, pdas, media players, gpss, etc.), communication/networking tools, and social networks appropriately to access, manage, integrate, evaluate, and create information to successfully function in a knowledge economy;
3. demonstrate utilizing current and new technologies specific to the program of study, course; and/or industry; and
4. apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies.

# Army Cybersecurity, Leadership, Education, and Training IV

1. **General requirements.** This course is recommended for students in Grade 12. Leadership Education and Training (LET IV) builds upon the mastery of LET 3 skills and abilities, and provides cadets multiple opportunities to manage and lead others in the school, and their communities. There are 12 active learning lessons within five chapters. Cadets will also learn the offensive side of cybersecurity while delving into advance cybersecurity topics.

2. **Introduction.**
   A. Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education andsucceed in current or emerging professions.

   B. The Government and Public Administration Career Cluster focuses on planning and performing governmental functions at the local, state, and federal levels, including governance, national security, foreign service, planning revenue and taxation, and regulations.

   C. In Army Cybersecurity, Learning, Education, and Training IV students look closely at their leadership role in continuous improvement, LET 4 cadets are mentors and leaders to others, look beyond high school into adulthood, identify personal management and accountability strategies and develop a 10 year plan for professional and personal success, manage a service learning project, examine how competing principles and values challenge the fundamental principles of society.

   D. Students will participate in a Career Preparation Work-Based Learning experience in this course, whichincludes paid or unpaid internship, pre-apprenticeship, or apprenticeship experiences relevant to the program of study.

   E. Students are encouraged to participate in extended learning experiences such as career and technicalstudent organizations and other leadership or extracurricular organizations.

3. **Knowledge and skills.**
   A. **The cadet demonstrates professional standards/employability skills as required by business and industry. The cadet is expected to:**
      1. Communicate effectively with others using oral and written skill;
      2. Demonstrate collaboration skills through teamwork;
      3. Demonstrate professionalism by conducting oneself in a manner appropriate for the profession and workplace;
      4. Demonstrate positive, productive work ethic by performing assigned tasks as directed;
      5. How integrity by choosing the ethical course of action and complying with all applicable rules, laws, and regulations; and
      6. Demonstrate time-management skills by prioritizing tasks, following schedules, and tending to goal-relevant activities in a way that uses time wisely and optimizes efficiency and results.

   B. **The cadet identifies various Principles of cybersecurity. The cadet is expected to:**
      1. Define the principles of cybersecurity
      2. Describe why each principle is important to security and how it enables the development of security mechanisms that can implement desired security policies;
      3. Analyze common security failures and identify specific design principles that have been violated;
      4. Given a specific scenario, identify the design principles involved or needed; and

5. Understand the interaction between security and system usability and the importance for minimizing the effects of security mechanisms.

C. **The cadet applies Forensics knowledge and skills. The cadet is expected to:**
   1. Follow data acquisition and storage guidelines;
   2. Use open-source digital forensics tools to create disk images, recover deleted files, and extract hidden information; and
   3. Understand metadata and how it is stored and can be utilized in digital forensics.

D. **The cadet understands and implements Compliance in cyber. The cadet is expected to:**
   1. Understand the frameworks, standards, processes, and tools available to comply with information security laws and regulations; and
   2. Apply these concepts to real-world scenarios.

E. **The cadet employs Reverse Engineering effectively. The cadet is expected to:**
   1. Explore the legal issues associated with reverse engineering; and
   2. Practice using open-source reverse engineering software to conduct file analysis.

F. **The cadet demonstrates knowledge on SCADA system. The cadet is expected to:**
   1. Recognize the components of a SCADA system; and
   2. Investigate vulnerabilities associated with the component.

G. **The cadet understands Planning and Scoping procedures. The cadet is expected to:**
   1. Demonstrate Planning for engagement
   2. Understand legal concepts
   3. Identify types of assessment
   4. Describe Scoping; and
   5. Explain compliance-based assessments.

H. **The cadet displays information gathering and vulnerability identification skills. The cadet is expected to:**
   1. Employ information gathering techniques;
   2. Apply vulnerability scans;
   3. Manage planning the exploit; and
   4. Implement specialized systems.

I. **The cadet identifies attacks and exploits. The cadet is expected to:**
   1. Identify social engineering attacks and network-based attacks;
   2. Describe network-based attacks (extended unit to align with 38 wk training)
   3. Identify application-based attacks, local host attacks and physical security attacks; and
   4. Describe post-exploitation.

J. **The cadet employs penetration testing tools. The cadet is expected to:**
   1. Identify Nmap and tools by use case;
   2. Describe tool output analysis; and
   3. Understand basic scripting.

K. **The cadet demonstrates reporting and communication skills. The cadet is expected to:**
   1. Employ report writing skills;
   2. Apply post engagement strategy;
   3. Implement mitigation strategies;
   4. Describe communication importance; and
   5. Employ effective programming.

L. **The cadet applies leadership skills to continuous improvement and program outcomes. The cadet is expected to:**
   1. Examine the role of leadership in continuous improvement;
   2. Identify team attributes that foster continuous improvement;
   3. Relate the Army JROTC program outcomes to leadership; and
   4. Plan personal and battalion goals.

M. **The cadet applies teaching strategies to lesson plan or mentoring project. The cadet is expected to:**
   1. Explain the purpose of a lesson plan;
   2. Describe the four phases of a lesson plan;
   3. Relate teaching and learning to the four phase lesson plan model; and
   4. Explore cooperative learning strategies.

N. **The cadet uses feedback to enhance your effectiveness as a leader. The cadet is expected to:**
   1. Explain why feedback is important in the learning process;
   2. Describe the characteristics of effective feedback; and
   3. Identify the basic ground rules and tips for giving effective feedback.

O. **The cadet determines how to successfully manage themselves after high school. The cadet is expected to:**
   1. Identify how core abilities relate to life beyond high school;
   2. Analyze the pros and cons of personal independence;
   3. Explore aspects of post-high school life; and
   4. Evaluate the importance of personal accountability.

P. **The cadet appraises their plans for the future. The cadet is expected to:**
   1. Distinguish between professional and personal goal;
   2. Determine how personal goals and values affect professional success;
   3. Explore aspects of professional development; and
   4. Identify your professional and personal goals for the next 10 years.

Q. **The cadet Applies motivational strategies to teams. The cadet is expected to:**
   1. Identify how individual performance within a team is influenced by the leader; and
   2. Explain the six tactics to motivate others.

R. **The cadet gives feedback and direction to team members. The cadet is expected to:**
   1. Determine how communication is important for effective leadership;
   2. Explain the basic flow and purpose of informal communication;
   3. Review the major elements of a communication model; and
   4. Determine how to overcome barriers of effective communication.

S. **The cadet manages a service learning project. The cadet is expected to:**

1. Describe the four project management phases;
2. Identify the critical components needed for successful project management; and
3. Identify the key features of Gantt and PERT charts.

T. **The cadet examines how competing principles and values challenge the fundamental principles of our society. The cadet is expected to:**
1. Explain the importance of fundamental principles; and
2. Compare positions on issues related to the fundamental principles and values of government and individual rights in American society.

U. **The cadet develops solutions for future challenges to citizen's rights. The cadet is expected to:**
1. Describe the potential impacts of increased diversity;
2. Explain some of the ways developments in technology might impact direct democracy, and free speech;
3. Explain how terrorism and cyberattacks can limit citizen freedoms; and
4. Explain why economic instability can pose a threat to democracy and citizens rights.

V. **The cadet applies the principles of Cybersecurity.  The cadet is expected to:**
1. Define the principles of cybersecurity;
2. Describe why each principle is important to security and how it enables the development of security mechanisms that can implement desired security policies;
3. Analyze common security failure and identify specific design principles that have been violated;
4. Given a specific scenario, identify the design principles involved or needed; and
5. Understand the interaction between security and system usability and the importance for minimizing the effects of security mechanisms.

W. **The cadet analyzes network architecture and design.  The cadet is expected to:**
1. Explain use cases and purpose for frameworks, best practices and secure configuration guides;
2. Given a scenario, implement secure network architecture concepts;
3. Given a scenario, implement secure systems design;
4. Explain the importance of secure staging deployment concepts;
5. Explain the security implications of embedded systems; and
6. Summarize secure application development and deployment concepts.

X. **The cadet summarizes cloud and virtualization concepts.**

Y. **The cadet describes risk management.  The cadet is expected to:**
1. Explain the importance of policies, plans and procedures related to organizational security;
2. Summarize business impact analysis concepts; and
3. Explain risk management processes and concepts;

Z. **The cadet applies Operations and Incident Response methods.  The cadet is expected to:**
1. Given a scenario, follow incident response procedures;
2. Summarize basic concepts of forensics; and
3. Explain disaster recovery and continuity of operation concepts.

AA. **The student develops technology skills. The student is expected to:**
1. use technology as a tool to research, organize, evaluate, and communicate information;

2. use digital technologies (computers, pdas, media players, gpss, etc.), communication/networking tools, and social networks appropriately to access, manage, integrate, evaluate, and create information to successfully function in a knowledge economy;
3. demonstrate utilizing current and new technologies specific to the program of study, course; and/or industry; and apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technology.