Maryland
STATE DEPARTMENT OF EDUCATION

Program of Study Guide: Junior Reserve US Armed Forces - DRAFT

Comprehensive guidelines and course standards for the JROTC Army, Navy, Air Force and Marines Corp

Office of College and Career Pathways

July 2025

MARYLAND STATE DEPARTMENT OF EDUCATION

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Document Control Information

Title:	Program of Study Guide: Junior Reserve Officers' Training Corps Armed Forces
Security Level:	Not for Distribution
File Name:	JROTCArmyNavyAirForceMarines.docx

DOCUMENT HISTORY

Document Version	Date	Summary of Change
1.0	November 2024	Initial Document
2.0	November 2024	Revision
3.0	November 2024	Revision
4.0	November 2024	Revision
5.0	December 2024	Revision
6.0	March 2025	Revision
7.0	April 2025	Revision

Purpose

The Public Safety Junior Reserve Officers' Training Corps (JROTC) Program of Study (POS) is designed to prepare students for leadership roles and careers in public safety, including law enforcement, firefighting, emergency medical services, and homeland security. This POS offers students a comprehensive academic and technical education, equipping them with the skills, knowledge, and hands-on experience necessary to transition seamlessly into postsecondary education, specialized training programs, or immediate employment in public safety field.

In addition to academic standards, the Maryland State Department of Education (MSDE) 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.

Sources of Standards

The Public Safety Junior Reserve Officers' Training Corps (JROTC) Program of Study (POS) is informed by several authoritative sources that provide comprehensive guidelines and frameworks for public safety education. These sources ensure the program aligns with industry standards, prepares students with essential skills, and promotes leadership, technical competence, and civic responsibility. Below is a list of these sources, their descriptions, applications in course development, and corresponding web links:

Below is a list of these sources, along with descriptions, their applications in course development, and corresponding web links:

1. **Advance CTE's Career Clusters Framework**
   A. **Description:** The Advance CTE framework provides a nationally recognized structure for organizing career and technical education (CTE) into Career Clusters.
   B. **Use:** The framework serves as a foundational guideline for developing GIS and ensuring alignment with industry-specific expectations and highlighting essential knowledge and skills for each level of study.
   C. **Source:** Advance CTE Career Clusters: https://careertech.org/career-clusters/

2. **U.S. Department of Labor's Law, Public Safety, Corrections, and Security**
   A. **Description:** outlines careers, knowledge, skills, and abilities required for various roles within the public safety and security sectors.
   B. **Use:** Guides the development of standards for Public Safety JROTC to align with national workforce expectations.
   C. **Source:** Law, Public Safety, Corrections and Security: https://www.onetonline.org/find/career?c=12

3. **National Incident Management System (NIMS)**
   A. **Description:** NIMS offers a framework for emergency response coordination at local, state, and national levels.
   B. **Use:** Informs curriculum content on emergency response, disaster management, and interagency collaboration, ensuring students are prepared for crisis scenarios.
   C. **Source:** NIMS: https://www.fema.gov/national-incident-management-system

4. **GIS Certification Institute (GISCI)**
   A. **Description:** GISCI offers the GIS Professional (GISP) certification, emphasizing ethical practice and professional competence in GIS. The certification requires a combination of education, experience, and contributions to the profession.
   B. **Use:** The GISCI standards guide the ethical and professional components of the curriculum, instilling best practices and professional responsibility in students.
   C. **Source:** GIS Certification Institute: https://www.gisci.org/

5. **Department of Homeland Security (DHS) Standards and Training:**
   A. **Description:** DHS provides resources, training, and guidelines to support education in homeland security, cybersecurity, and emergency preparedness.
   B. **Use:** Integrates homeland security principles into the curriculum, preparing students for careers in national security and disaster management.

C. **Source:** Department of Homeland Security: https://www.dhs.gov/

6. **Army Reserve Officers' Training Corps (ROTC)**
   A. **Description:** The Army ROTC program provides college students with leadership training and military education, preparing them to become commissioned officers in the U.S. Army upon graduation.
   B. **Use:** Offers scholarships and training programs that develop leadership skills applicable in both military and civilian careers.
   C. **Source:** Army ROTC: https://www.goarmy.com/rotc.html/

7. **Navy Reserve Officers' Training Corps (ROTC)**
   A. **Description:** The Navy ROTC program provides college students with leadership training and military education, preparing them to become commissioned officers in the U.S. Navy upon graduation.
   B. **Use:** Offers scholarships and training programs that develop leadership skills applicable in both military and civilian careers.
   C. **Source:** Navy ROTC: https://www.nrotc.navy.mil/

8. **Air Force Reserve Officers' Training Corps (ROTC)**
   A. **Description:** The Air Force ROTC program provides college students with leadership training and military education, preparing them to become commissioned officers in the U.S. Air Force upon graduation.
   B. **Use:** Offers scholarships and training programs that develop leadership skills applicable in both military and civilian careers.
   C. **Source:** Air Force ROTC: https://www.afrotc.com/

9. **Marines Core Officers' Training Corps (ROTC)**
   A. **Description:** The Army ROTC program provides college students with leadership training and military education, preparing them to become commissioned officers in the U.S. Army upon graduation.
   B. **Use:** Offers scholarships and training programs that develop leadership skills applicable in both military and civilian careers.
   C. **Source:** Marines ROTC: https://www.nrotc.navy.mil/marine.html/

10. **U.S. Department of Labor's Geospatial Technology Competency Model (GTCM)**
    A. **Description:** GTCM provides training standards and certification programs for law enforcement and corrections personnel in Maryland.
    B. **Use:** Offers resources and standards for developing training modules.
    C. **Source:** GTCM: https://www.careeronestop.org/CompetencyModel/competency-models/geospatial-technology.aspx/

11. **Esri Technical Certification Program**
    A. **Description:** Esri, a leading provider of GIS software, offers a technical certification program validating expertise in using Esri's ArcGIS software. Certifications range from entry-level to professional levels across various domains.
    B. **Use:** Incorporating Esri's certification standards ensures that the curriculum aligns with industry-recognized benchmarks, preparing students for certification exams like the Esri ArcGIS Desktop Certification.
    C. **Source:** Esri Technical Certification: https://www.esri.com/training/certification/

Course Descriptions

Course Level	Course Information	Description
Required Core: Course 1	Military Leadership I (ML I) SCED: <15-1299.02> Grades: 9-12 Prerequisite: None Credit: 1	This introductory course lays the foundation for leadership development and citizenship. Students explore the history, purpose, and structure of JROTC, focusing on personal responsibility, wellness, and basic leadership principles. Key topics include military customs and courtesies, effective communication, and the development of study and time-management skills. The course emphasizes character building and the importance of community service. And students will explore principles of map-making, spatial thinking, and the significance of geography in today's world.
Required Core: Course 2	Military Leadership II (ML II) SCED: <15-1299.02> Grades: 10-12 Prerequisite: course I Credit: 1	Building upon the first course, LET II delves deeper into leadership theory and application. Students engage in team-building exercises, learn conflict resolution strategies, and study the roles and responsibilities of leaders and followers. The curriculum includes map reading and land navigation skills, an introduction to first aid, and an overview of the U.S. Constitution and government functions. Practical leadership opportunities are provided to enhance experiential learning. Students learn to use GIS software, such as Esri's ArcGIS Desktop, for data collection, management, analysis, and visualization. Key topics include spatial data models, georeferencing, attribute data management, and introductory spatial analysis techniques.
Optional Flex: Course 1	Military Leadership III (ML III) SCED: <15-1299.02> Grades: 11-12 Prerequisite: course I, course II Credit: 1	Course III emphasizes advanced leadership techniques and management skills. Students assume leadership roles within the JROTC program, planning and executing events and activities. Students explore complex GIS functions, including network analysis, 3D modeling, and geostatistics. The course covers ethical decision-making, staff functions, and career exploration in military and civilian sectors. Instruction includes advanced first aid, wellness and fitness planning, and an introduction to teaching skills, preparing students to mentor junior cadets.

Course Level	Course Information	Description
Optional Flex: Course 2	Career Connected Learning I SCED: <XX> Grades: 11-12 Prerequisite: Required Courses I and II Credit: 1	This flexible, work-based learning course introduces students to real-world applications of classroom knowledge and technical skills through on-the-job experiences and reflective practice. Students engage in career exploration, skill development, and professional networking by participating in youth apprenticeships, registered apprenticeships, pre-apprenticeships, internships, capstone projects, or other approved career-connected opportunities. Variable credit (1–3) accommodates the required on-the-job training hours and related instruction. By integrating industry standards, employability skills, and personalized learning goals, Career Connected Learning I equips students to make informed career decisions, develop a professional portfolio, and build a strong foundation for success in postsecondary education, training, or the workforce.
Optional Flex: Course 3	Career Connected Learning II SCED: <XX> Grades: 11-12 Prerequisite: Career Connected Learning I Credit: 1	Building on the foundational experiences of Career Connected Learning I, this advanced work-based learning course provides students with deeper on-the-job practice, leadership opportunities, and refined career exploration. Students continue to enhance their technical and professional skills, expanding their industry networks and aligning personal goals with evolving career interests. Variable credit (1–3) remains aligned with the required training hours and related instruction. Through elevated responsibilities and skill application, Career Connected Learning II prepares students to confidently transition into higher-level postsecondary programs, apprenticeships, or the workforce.

Dual Enrollment and Career Connected Learning Experiences Must be Aligned to the CTE Core

Industry-Recognized Credentials and Work-Based Learning

Industry-Recognized Credentials - The standards in this document are aligned to the following certifications:
By the end of Course I: Esri ArcGIS Desktop Entry Certification **By the end of Course II:** Geographic Information Systems (GIS) Certification **Optional Credentials (via the Flex Course options):** Esri ArcGIS Desktop Associate Certification GIS Technician Certification

Work-Based Learning Examples and Resources		
Course I: **Career Awareness**	**Course II:** **Career Preparation**	**Flex Courses:** **Career Preparation**
• Industry Visits • Guest Speakers • Participation in Career and Technical Student Organizations • Postsecondary Visits – Program Specific Site Tours • Mock Interviews	• All of Career Awareness plus the following: • Job Shadow • Paid and Unpaid Internships • Local Emergency Services Facility Visits	• Paid and Unpaid Internships • Apprenticeships • Dual Enrollment Opportunities

Labor Market Information: Definitions and Data

Labor market information (LMI) plays a crucial role in shaping Career and Technical Education (CTE) programs by providing insights into industry demands, employment trends, and skills gaps. This data helps education leaders assess the viability of existing programs and identify opportunities for new offerings. By aligning CTE programs with real-time labor market needs, schools can better prepare students for in-demand careers and ensure that resources are effectively used to support pathways that lead to high-quality, sustainable employment.

Standard Occupational Code (SOC) and Aligned Industry:

Indicator	Definition	Pathway Labor Market Data
High Wage[1]	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 state of Maryland, and/or leads to a position that pays at least the median hourly or annual wage for the DC-VA-MD-WV Metropolitan Statistical Area (MSA). *Note: A 25th percentile hourly wage of $24.74 or greater is required to meet this definition.*	**Standard Occupational Code:** 55-1010: Military Technical Operations Officers 15-1299.02: Geographic Information Systems Technologists and Technicians **Hourly Wage/Annual Salary** 25th Percentile: $29.00 / $60,320 50th Percentile: $38.00 / $79,040.00 75th Percentile: $47.00 / $97,760.00

[1] Living Wage Calculator: https://livingwage.mit.edu/states/24

Indicator	Definition	Pathway Labor Market Data
High Skill	Those occupations located within the DC-VA-MD-WV Metropolitan Statistical Area (MSA) with the following education or training requirements: completion of an apprenticeship program; completion of an industry-recognized certification or credential; associate's degree, bachelor's degree, or higher.	Military Operations Education: High school diploma, for officer require a bachelor's degree. Training: On-the-job training is common to become proficient with specific technologies and equipment. Certifications: Esri ArcGIS Desktop. Additional Requirements: Must pass written and physical exams, drug screenings, and background checks. Geographic Information Systems Technologists and Technicians: Education: Generally, require an Associate degree or bachelor's degree in GIS, geography, computer science, environmental science, or a related field. Training: Hands-on experience with GIS software is crucial. Certification: While not always required, certifications can enhance employment opportunities: Esri Technical Certification. GIS Professional (GISP) certification from the GIS Certification Institute (GISCI). Additional Requirements: Must pass written and physical exams, drug screenings, and background checks.
In-Demand	Annual growth plus replacement, across all Maryland occupations, is 405 openings between 2024-2029.	**Annual Openings**

Labor Market Information Data Source

Lightcast Q4 2024 Data Set. Lightcast occupation employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates are also affected by county-level Lightcast earnings by industry. Foundational data for the state of Maryland is collected and reported by the Maryland Department of Labor.

Methodology for High Wage Calculations

To combine labor market data across multiple Standard Occupational Classifications (SOCs), a weighted average approach was used to ensure accurate representation of the marketplace. Median wages for each SOC were weighted based on their respective employment levels, reflecting the relative demand for each occupation. This method ensures that occupations with higher employment contribute proportionately to the overall wage calculation. Additionally, job openings from all relevant SOCs were summed to determine the total projected demand. For example, if Mechanical Engineers account for 67% of total employment and Electrical Engineers for 33%, their respective wages are weighted accordingly, and job openings are aggregated to provide a comprehensive view of labor market opportunities. This approach delivers a balanced and accurate representation of both wages and employment demand for the program.

Methodology for In-Demand Calculations

The baseline for annual job openings, taking into account new positions and replacement positions, was determined by taking the average of all annual job openings between 2024 and 2029 across all 797 career sectors at the 5-digit SOC code level. For the 2024-2029 period, average job openings (growth + replacement) is 405.

Course Standards: Military Leadership I

1. **GENERAL REQUIREMENTS** This course is recommended for students in Grades 9-10.

2. **INTRODUCTION**
   A. Career and Technical Education (CTE) instruction provides 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 Career Cluster focuses on preparing students for careers in n technology-related fields, including Geographic Information Systems (GIS), geospatial technologies, and cartography. This cluster emphasizes the skills needed to collect, analyze, and interpret spatial data, which are essential in various industries such as environmental management, urban planning, emergency response, and homeland security.
   C. This program introduces students to foundational knowledge in GIS technology, spatial thinking, and cartographic principles. Students will gain practical experience through structured coursework and exposure to real-world GIS applications.
   D. Course I introduces students to foundational topics such as the basics of leadership, service to country and GIS. To learn the importance of spatial data, map projections, coordinate systems, and an overview of GIS software tools. The course emphasizes critical thinking and problem-solving skills through geographic inquiry and hands-on projects.
   E. Students will participate in at least two Career-Connected Education and Work-Based Learning experiences in this course, such as attending guest lectures, job shadowing, or site visits with local or state agencies.
   F. Students are encouraged to participate in extended learning experiences through aligned Career and Technical Student Organizations (CTSOs). CTSOs are a cocurricular requirement in the Carl D. Perkins Act, and alignment to CTSO activities is an expectation for CTE programs in the state of Maryland.

3. **KNOWLEDGE AND SKILLS**
   A. **The student demonstrates the necessary skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected to:**
      1. Identify and demonstrate positive work behaviors that enhance employability, including punctuality, professional appearance, and adherence to safety protocols.
      2. Exhibit effective communication and active listening skills when responding to scenarios and working within a team.
      3. Solve problems using critical thinking and decision-making skills, especially when analyzing spatial data and addressing geographic challenges.
      4. Demonstrate leadership and teamwork skills through group activities, projects, and collaborative exercises involving GIS applications. exercises.
      5. Demonstrate an understanding of ethical and legal responsibilities in professions.

   B. **The student identifies various career pathways. The student is expected to:**
      1. Develop a career plan that outlines required education, certifications, and skills for roles such as GIS technician, cartographer, or geospatial analyst.
      2. Identify entry-level opportunities, including internships and assistant positions, and define pathways to long-term career growth in the geospatial industry.

3. Demonstrate effective interview skills.

C. **The student develops technology and digital literacy skills. The student is expected to:**
   1. Use technology as a tool for research, organization, communication, and problem-solving.
   2. Use digital tools, including computers, mobile devices, collaboration platforms, and cloud services, to access, manage, and create information.
   3. Demonstrate proficiency in using emerging and industry-standard technologies, including GIS software applications, and apply creative techniques to produce visually appealing maps and spatial data presentations.
   4. Understand ethical and legal considerations for technology use, including the principles of data protection, copyright, and responsible technology use.

D. **The student integrates core academic skills into practice. The student is expected to:**
   1. Demonstrate the use of clear communication techniques, both written and verbal, that are consistent with industry standards.
   2. Apply English concepts such as writing informative texts when documenting the design process and articulating goals.
   3. Apply mathematics skills, including measurement, ratios, and data interpretation, in the context of spatial analysis and map creation.

E. **The student demonstrates knowledge and skills for ensuring safety. The student is expected to:**
   1. Understand and implement safety protocols to minimize risks during operations.
   2. Demonstrate knowledge of ergonomics and best practices to prevent strain or injury when working with technology over extended periods..
   3. Recognize the importance of data security and protection, implementing measures to safeguard sensitive geospatial data from unauthorized access or loss.

F. **The student demonstrates effective communication and teamwork skills. The student is expected to:**
   1. Practice clear verbal communication and active listening during collaborative GIS projects and when presenting data analyses.
   2. Collaborate effectively with peers and professionals during group projects, workshops, and team-based exercises, contributing to shared objectives.
   3. Demonstrate cultural awareness and sensitivity, recognizing the diverse contexts in which geospatial data is applied and the importance of inclusive communication.

G. **The student applies basic health and wellness principles in response. The student is expected to:**
   1. Understand the fundamentals of project planning, including setting objectives, defining tasks, and managing timelines for GIS projects.
   2. Utilize tools and software to track project progress and collaborate with team members effectively.
   3. Apply problem-solving strategies to overcome obstacles encountered during GIS data collection and analysis.

Course Standards: Military Leadership II

1. **GENERAL REQUIREMENTS** This course is recommended for students in Grades 10-11

2. **INTRODUCTION**
   A. Career and Technical Education (CTE) instruction provides 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 Career Cluster focuses on preparing students for careers in n technology-related fields, including Geographic Information Systems (GIS), geospatial technologies, and cartography. This cluster emphasizes the skills needed to collect, analyze, and interpret spatial data, which are essential in various industries such as environmental management, urban planning, emergency response, and homeland security.
   C. This program introduces students to foundational knowledge in GIS technology, spatial thinking, and cartographic principles. Students will gain practical experience through structured coursework and exposure to real-world GIS applications.
   D. Course II introduces students to advanced topics such as spatial data, map projections, coordinate systems, and an overview of GIS software tools. The course emphasizes critical thinking and problem-solving skills through geographic inquiry and hands-on projects.
   E. Students will participate in at least two Career-Connected Education and Work-Based Learning experiences in this course, such as attending guest lectures, job shadowing, or site visits with local or state agencies.
   F. Students are encouraged to participate in extended learning experiences through aligned Career and Technical Student Organizations (CTSOs). CTSOs are a cocurricular requirement in the Carl D. Perkins Act, and alignment to CTSO activities is an expectation for CTE programs in the state of Maryland.

3. **KNOWLEDGE AND SKILLS**
   A. **The student demonstrates advanced skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected to:**
      1. Identify and demonstrate positive work behaviors that enhance employability, including punctuality, professional appearance, and adherence to safety protocols.
      2. Exhibit effective communication and active listening skills when responding to scenarios and working within a team.
      3. Solve problems using critical thinking and decision-making skills, especially when analyzing spatial data and addressing geographic challenges.
      4. Demonstrate leadership and teamwork skills through group activities, projects, and collaborative exercises involving GIS applications. exercises.
      5. Demonstrate an understanding of ethical and legal responsibilities in professions.

   B. **The student identifies various career pathways. The student is expected to:**
      1. Develop a career plan that outlines required education, certifications, and skills for roles such as GIS technician, cartographer, or geospatial analyst.
      2. Identify entry-level opportunities, including internships and assistant positions, and define pathways to long-term career growth in the geospatial industry.
      3. Demonstrate effective interview skills.

C. **The student develops management skills. The student is expected to:**
   1. Recognize hazardous materials and unsafe conditions during investigations or patrols, applying the appropriate National Incident Management System (NIMS) and Incident Command System (ICS) protocols to ensure safety.
   2. Perform basic search-and-rescue techniques, during simulations, emphasizing public safety, scene stabilization, and assistance in situations such as community response and disaster response.

D. **The student integrates core academic skills into practice. The student is expected to:**
   1. Demonstrate the use of clear communication techniques, both written and verbal, that are consistent with industry standards.
   2. Apply English concepts such as writing informative texts when documenting the design process and articulating goals.
   3. Apply mathematics skills, including measurement, ratios, and data interpretation, in the context of spatial analysis and map creation.

E. **The student enhances safety awareness and operational readiness. The student is expected to:**
   1. Understand safety protocols to minimize risks when working with computer equipment and in field data collection environments.
   2. Demonstrate knowledge of ergonomics and best practices to prevent strain or injury when working with technology over extended periods.
   3. Recognize the importance of data security and protection, implementing measures to safeguard sensitive geospatial data from unauthorized access or loss.

F. **The student demonstrates effective communication and teamwork skills. The student is expected to:**
   1. Practice clear verbal communication and active listening during collaborative GIS projects and when presenting data analyses.
   2. Collaborate effectively with peers and professionals during group projects, workshops, and team-based exercises, contributing to shared objectives.
   3. Demonstrate cultural awareness and sensitivity, recognizing the diverse contexts in which geospatial data is applied and the importance of inclusive communication.

Course Standards: Military Leadership III

1. **GENERAL REQUIREMENTS** This course is recommended for students in Grades 11-12.

2. **INTRODUCTION**
   A. Career and Technical Education (CTE) instruction provides 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 Career Cluster focuses on preparing students for careers in technology-related fields, including Geographic Information Systems (GIS), geospatial technologies, and cartography. This cluster emphasizes the skills needed to collect, analyze, and interpret spatial data, which are essential in various industries such as environmental management, urban planning, emergency response, and homeland security.
   C. This program introduces students to foundational knowledge in technology, spatial thinking, and cartographic principles. Students will gain practical experience through structured coursework and exposure to real-world GIS applications.
   D. Course III introduces students to intermediate topics such as advanced spatial data analysis, detailed map projections, coordinate systems, and in-depth use of GIS software tools. The course emphasizes critical thinking and problem-solving skills through geographic inquiry and hands-on projects, preparing students for more complex applications of GIS technology.
   E. Students will participate in at least two Career-Connected Education and Work-Based Learning experiences in this course, such as attending guest lectures, job shadowing, or site visits with local or state agencies that utilize GIS technology.
   F. Students are encouraged to participate in extended learning experiences through aligned Career and Technical Student Organizations (CTSOs). CTSOs are a cocurricular requirement in the Carl D. Perkins Act, and alignment to CTSO activities is an expectation for CTE programs in the state of Maryland.

3. **KNOWLEDGE AND SKILLS**
   A. **The student demonstrates leadership capabilities. The student is expected to:**
      1. Utilize GIS software tools to perform spatial data manipulation, including data importing, georeferencing, and basic spatial analyses such as buffering and overlay techniques.
      2. Understand and apply coordinate systems and map projections, recognizing their impact on spatial data accuracy and map interpretation.
      3. Manage geospatial data, including vector and raster data types, and understand data formats, metadata, and data quality considerations.
      4. Create thematic maps using appropriate symbology, classification methods, and cartographic design principles to effectively communicate geographic information.

   B. **The student develops advanced investigative skills and emergency response skills. The student is expected to:**
      1. Define geographic problems or questions suitable for GIS analysis at an intermediate level.
      2. Develop project plans outlining objectives, required data, methodologies, and expected outcomes for GIS tasks.
      3. Execute GIS projects by applying learned techniques to analyze spatial relationships and patterns.
      4. Demonstrate effective interview skills.

C. **The student develops technology and digital literacy skills. The student is expected to:**
   1. Use technology as a tool for research, organization, communication, and problem-solving.
   2. Use digital tools, including computers, mobile devices, collaboration platforms, and cloud services, to access, manage, and create information.
   3. Demonstrate proficiency in using emerging and industry-standard technologies, including skills and applying creative techniques to create visually appealing products.
   4. Understand ethical and legal considerations for technology use, including the principles of data protection, copyright, and responsible technology use.
   5. Interpret and apply GIS mapping for incident planning and resource deployment.

D. **The student integrates core academic skills into practice. The student is expected to:**
   1. Demonstrate the use of clear communication techniques, both written and verbal, that are consistent with industry standards.
   2. Apply English concepts such as writing informative texts when documenting the design process and articulating goals.
   3. Demonstrate mathematical understanding and awareness with service decision-making.
   4. Use GIS software features to create interactive presentations and web maps when applicable.

E. **The student engages in collaborative work and demonstrates teamwork skills. The student is expected to:**
   1. Participate in group GIS projects, contributing ideas and efforts to achieve common goals.
   2. Communicate effectively with team members, practicing active listening and constructive feedback.
   3. Respect diverse perspectives, recognizing the value of different approaches and solutions in collaborative settings.

F. **The student participates in extended learning opportunities to enhance career readiness. The student is expected to:**
   1. Engage in apprenticeships with local departments, or state departments.
   2. Engage in internships with local departments, or state departments.
   3. Begin preparation for industry-recognized certifications, such as the Esri ArcGIS Desktop Entry Certification, by identifying areas of study and practice.

G. **The student prepares for a work-based learning experience by demonstrating professional skills. The student is expected to:**
   1. Develop a professional resume, portfolio, or skills showcase, highlighting competencies.
   2. Practice interview skills and demonstrate knowledge of workplace expectations in settings.
   3. Set career-related goals for a work-based learning experience, including specific skills to develop and refine.

Course Standards: Career Connected Learning I and II

Career connected learning is an educational approach that integrates classroom instruction with real-world experiences, enabling high school students to explore potential careers and develop relevant skills before graduation. By participating in work-based learning opportunities—such as apprenticeships, internships, capstone projects, and school-based enterprises—students apply academic concepts in authentic settings, gain practical industry knowledge, and build professional networks. This hands-on engagement helps students connect their studies to future career paths, strengthens their problem-solving and communication skills, and supports a smoother transition into college, vocational programs, or the workforce.

All Career and Technical Education Programs of Study include aspects of work-based learning, and almost all of the programs include two Career Connected Learning (CCL) courses. Below are the course descriptions for CCL I and CCL II. The CCL standards can be found via this link: